KU LEUVEN

FACULTEIT SOCIALE WETENSCHAPPEN

The map is not the territory

The role of knowledge in spatial restructuring processes

Promotor: Prof. Dr. Geert Van Hootegem
Onderzoekseenheid:
Centrum voor Sociologisch Onderzoek [CeSO]

Proefschrift tot het verkrijgen
van de graad van
Doctor in de Sociale Wetenschappen
aangeboden door
Monique RAMIOUL

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Voor Paul, Hans, Evert en Bregje

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'It is good to have an end to journey toward; but it is the journey that matters, in the end' (E. Hemingway)

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Contents

General introduction

During the last decade there has been a growing policy and academic interest in offshoring and outsourcing (Kirkegaard, 2004; Huws, Flecker & Dahlmann, 2004; Statistics Denmark *et al.,* 2008; van Welsum & Vickery, 2005). This interest has been sustained by the fact that, since the 1990s, there has been an acceleration in the offshoring and outsourcing of business services, *e.g.* as a result of intensified global trade, opportunities presented by Information and Communication Technologies (ICTs) and the availability of a skilled workforce in the Far East and Central Europe. Although outsourcing and offshoring are often combined, they represent two different corporate strategies. Outsourcing refers to the contracting out of part of the production process, previously performed in-house, to an external provider. It is a managerial solution intended to accommodate the increased organisational complexity resulting from the constant trend towards diversification of products and services and more efficient production (World Trade Organization, 2005). The outcome is growing specialisation in industries and a lengthening of supply chains. Offshoring refers to a spatial shift in activities abroad, mostly to areas where the production conditions are most favourable. A more general term for this is relocation. Relocation leads to growing regional specialisation, interregional trade and economic globalisation. The outcome of historical processes of outsourcing and relocation is a complex inter-organisational and spatial division of labour. Corporate strategies of outsourcing and relocating activities are, of course, nothing new (Huws, 2006a; Gospel & Sako, 2010: 3ff). In manufacturing industries such as the automotive, electronics and clothing sectors, such practices have been common for decades and have been widely described (see for instance Froebel, Heinrichs & Krey, 1977; Gereffi, Humphrey & Sturgeon, 2005).

Economic globalisation, its key characteristic of growing global interconnectedness between firms[1] and regions, the intensified international division of labour and the recent acceleration in the outsourcing and relocation of business services, have been investigated and debated in a variety of studies using a wide range of theories and perspectives. These studies have mostly focused on economic relations between firms and regions or on changes in industrial organisation. Research providing key insights into the relations between firms encompasses economic theories dealing with different modes of economic governance ('market' *versus* 'organisation' and variants between the two), relationships between economic actors, and (networked) forms of interfirm collaboration. Economic geography views economic globalisation from the perspective of the spatial distribution of production, competitive advantages of regions and relationships between them. In both disciplines, the economic relations between economic actors or regions form the dominant perspective. The descriptions and explanations of the way in which the work is organised tend to be underdeveloped and relations between management and employees in these forms of inter-organisational relationships are generally not extensively addressed.

On the other hand we find theories and research into the organisation which have constituted a core field in sociology since its founding fathers. Sociological theories on industrial organisation have yielded comprehensive knowledge on the diversity and evolution of the internal structures of organisations. A central theme in this is the growing division of labour.

1 Although 'organisation' is a more general concept than 'firm', 'enterprise' and 'company', we opt to use these terms as synonyms because the organisations referred to in this study are business organisations principally operating for profit.

Generally speaking, sociological theories investigating the technical division of labour chiefly focus attention on the single organisation, while the inter-organisational and spatial separation of tasks and functions is less systematically investigated.

A central aim of this study is to define and apply a research framework making it possible to better understand the division of labour from a sociological labour process perspective. The study is built around two focal points within the broad field of research into this issue. The first focus is the spatial division of labour, understood as the distribution of functions and tasks between geographically dispersed units. This means that our prime interest is in the actual tasks involved in the labour process. This focus on the labour process further implies that the relations between management and workers serve as the main perspective when considering changes in this spatial division of labour. In these relations, the knowledge that workers bring to their work can be identified as a key element.

The first central question of this study is: 'What is the relationship between changes in the spatial division of labour and changes in the technical division of labour?'. The second central question is: 'What is the relationship between specific knowledge characteristics of activities and the design, implementation and outcome of their spatial restructuring and what are the strategies and agency of both management and workers on the use of knowledge in the context of the restructuring?'. In order to develop our research framework to address these questions, we need building-blocks for each of these.

In the first two chapters we search for relevant theories, concepts, insights and research to guide our empirical research. The first chapter deals with various fields of research on inter-organisational relations and the division of labour within and between firms. This leads to the definition of a conceptual framework and a vocabulary to describe changes in the spatial and technical division of labour, while a theoretical perspective is adopted in order to analyse them. This theoretical perspective is based on the labour process approach, which assigns a major role to the employment relationship. The second chapter explores how knowledge in organisations is addressed by different disciplines and theories. In this chapter we will clarify how we conceptualise knowledge in the labour process. In the third chapter we will describe the design of our empirical investigation. In the fourth and fifth chapters, case studies are used to find the answer to our central research questions and Chapter 6 formulates the general conclusions.

1 | A labour process perspective on spatial restructuring

Introduction

We have constructed our research framework in five steps. First we present the main trends in offshoring and outsourcing that have attracted our interest and clarify the resulting decision to focus on spatial restructuring events. The central point of the second section is the search for relevant theories to understand spatial restructuring. Here we explore some major theories that aim to explain why organisations collaborate with other organisations. Longstanding research and a wide range of well-elaborated theories are available in order to understand inter-organisational relations but the question remains as to the value of these for our research endeavour, which focuses on the labour process, its constituent tasks and the relations between management and workers. Next we turn to the division of labour as a core theme in sociology. We end this section by identifying in greater detail what needs to be developed for our study. On the one hand we need an analytical framework to describe and analyse changes in the division of labour. This will allow us to observe different forms of spatial restructuring from the perspective of tasks and functions. On the other hand we also need to understand what the outcome of this restructuring will be and why this is the case.

The third section of this chapter will describe in detail the analytical scheme that we will use to describe and analyse changes in the division of labour. A coherent analytical model is provided by the organisational structures approach and Modern Sociotechnical Systems Theory. In the fourth section we consider how to take account of the organisation when investigating spatial restructuring. Defining the organisation leads us to the employment relationship as an essential component. A theoretical perspective on the employment relationship is provided by the labour process approach. This is introduced by elaborating on indeterminacy, power and employee agency as its core conceptual anchors.

1.1 Spatial restructuring

1.1.1 The growing trend towards offshoring and outsourcing

As a result of the growing division of labour, which includes outsourcing and relocation, production processes are not restricted within the four walls of a single, physical organisation but extend beyond them. The production of goods and services takes place in complex chains involving a multitude of organisations which are linked to each other, either in trading relationships or under the governance of a common parent company. These linked firms may be located either close together or in different parts of the globe. The links between one organisation and another may take a variety of forms (Huws *et al.*, 2009; Gospel & Sako, 2010). Most firms combine in-house organisation of what they define as their core activities with various interfirm modes of collaboration for the other activities necessary to produce a good or deliver a service. Innovative projects are set up through joint ventures, standardised parts are manufactured in low-wage countries, maintenance of the premises is subcontracted to a specialised cleaning firm, marketing and customer relations services are provided by a call centre and the website is developed by a small freelance company, while the ICT infra-

structure is managed by a large business services provider. Organisations decide on the modes of organisation for all their activities, on their economic governance (outsourced or in-house) and on their location.

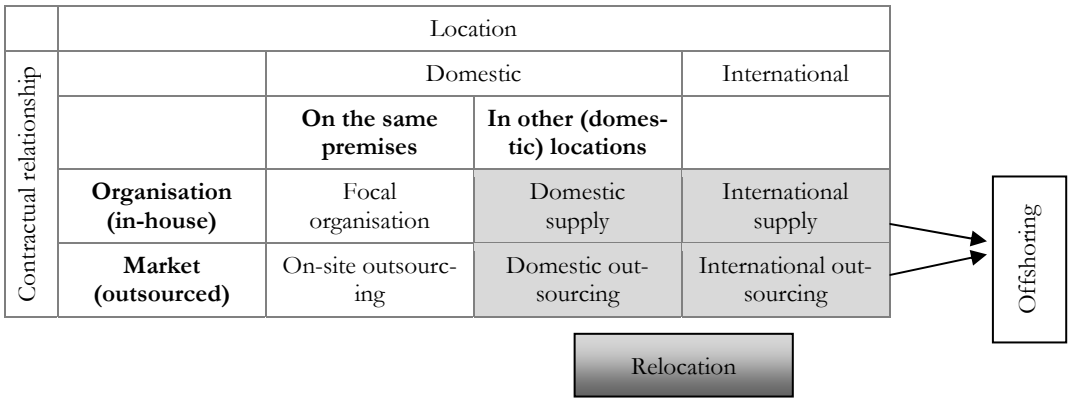
One relatively recent trend is towards an increase in the speed and dynamism of corporate restructuring in terms of accelerated outsourcing and relocation, specifically in the IT and business services sectors (Huws, Flecker & Dahlmann, 2004; Ramioul, Huws & Kirschenhofer, 2005; van Welsum & Reif, 2006; Flecker, 2007). In the context of a globalised economy with strong competition, organisations systematically reconsider which activities will be organised where and how, leading on some occasions to multiple restructuring processes occurring in rapid succession. Several factors have been suggested in the literature to explain this recent intensification and these can generally be grouped under three main drivers: first, differences in labour costs and labour regulations (which represents a traditional motive); second, the combination of labour market shortages and the growing availability of a (qualified) labour reserve in destination regions; and third, the reduction of trade barriers, growing international capital mobility and the transparency of regional competitive advantages (Ramioul & Huws, 2009b: 330). In addition, the widespread availability of Information and Communication Technologies (ICTs) is often identified as a key driver of accelerated outsourcing and relocation. These technologies contribute to the codification of knowledge in cost-effective ways and permit the storage, processing, communication, and retrieval of that knowledge (Soete, 2001: 152). In this capacity, ICTs allow the separation of the production and consumption of specific services that were previously inseparable and render the geographical proximity and temporal simultaneity of those activities increasingly irrelevant (Huws, Flecker & Dahlmann, 2004). Prominent examples cited are customer relations services and IT services. The widespread use of ICTs and their potential to bridge time differences and geographical distance therefore enable firms to operate 24/7 and overcome the limitations of time zones. Flecker (2007) also emphasises the supply-driven increase in the outsourcing and relocation of IT and business services: the emergence of large, transnational companies that specialise in providing business services to companies and actively market their services to potential clients. Finally, Ramioul and Huws (2009b) observe that the globalisation of IT and business service activities is a highly dynamic process due to corporate strategies of global sourcing, moving up the value chain, and corporate strategies of 'following the customer' and 'following the sun'. These practices are both outcomes and accelerators of economic globalisation.

1.1.2 A focus on relocations

Corporate restructuring strategies may take a variety of forms, involving either a geographical move, a change in the mode of economic governance of the activity in question or a combination of both. In the literature on offshoring and outsourcing, several terms and definitions have been introduced to categorise the different forms of in-house and interfirm modes of governance of economic activities (see for instance Huws, Flecker & Dahlmann, 2004; van Welsum & Vickery, 2005; Statistics Denmark *et al.*, 2008). These boil down to a basic scheme combining the contractual and spatial dimensions. The contractual dimension concerns the question of whether the activities are supplied as part of a trade relationship, that is outsourced, or whether they are organised in-house. In economics, this is referred to as the choice between 'make or buy' or 'market *versus* organisation'. Outsourcing is often misunderstood as a spatial move, but it should be distinguished from relocation. It is possible that the contractual basis for organising certain activities may change while they remain physically located within the same premises, for instance in the case of contracting out equipment

maintenance, facilities management or internal security. When we use the term outsourcing in this study, we refer to the contractual dimension: the supply of activities in a trade relationship with a third company. The physical, spatial movement of activities forms the second dimension of restructuring. While 'offshoring' has the particular connotation of international destinations, the broader term 'relocation' includes the spatial movement of activities to both domestic and international locations. Such relocations may or may not be combined with contractual outsourcing. These two dimensions and the different terms into which they are combined are depicted in Figure 1.1.

Figuur 1.1 Spatial and contractual organisation of economic activities



Source Based on Huws, Flecker & Dahlmann, 2004; van Welsum & Vickery, 2005; Statistics Denmark *et al.*, 2008

In this study we focus on the spatial dimension of restructuring (the grey cells in the figure), that is on relocations which include the physical movement of activities from one location to another location in an international or domestic destination, either combined with contractual outsourcing or not. The terms relocation and spatial restructuring are used as synonyms. Contractual changes may also be provoked by other forms of corporate restructuring, such as a change of ownership through acquisitions or mergers, for instance when companies buy out competitors or want to diversify their products and markets, or in the case of the privatisation of public services. Although such restructuring events may eventually also be accompanied by changes in the spatial organisation of the production processes involved, this is not necessarily the case. The basic characteristic here, as in the case of on-site outsourcing, is a change of ownership. This implies that the employees change employers but they remain at the same premises and at least in principle in the same physical working environment, and in principle they carry out the same tasks. Such types of corporate restructuring involving a change of ownership only are therefore not included in this study.

This decision to investigate relocations under different contractual conditions is based on the fact that our principal interest is in the restructuring of functions and tasks over distance. In economic research on outsourcing and offshoring the economic relationships between trading partners are central but we take as our perspective the actual tasks that workers carry out, and the relationships between these. The key question is whether spatial restructuring is accompanied by changes in these tasks and this question is relevant even where different contractual conditions govern the spatial restructuring. In other words, we investigate the relationship between spatial restructuring and changes in the technical division of labour and our analysis includes restructuring events that may or may not be accompanied by outsourc-

ing of the relocated tasks to another firm. As will be argued in more detail under section 1.2.2, this decision is based on the fact that functional coordination of spatially distributed work is needed in both inter-organisational and intra-organisational configurations. The decision to use the tasks making up a production process as the unit of observation and analysis places the mechanisms of this functional coordination, rather than contractual coordination, at the centre of the analysis.

With this question in mind, we must also acknowledge that relocation as such is not a necessary condition for changes in tasks and functions; these may also occur, for example, as a result of introducing new technologies. Similarly, a change of employer will in principle only change the contractual conditions under which a job is carried out - the employment contract and probably its various terms - while the content of the job as such is not necessarily affected. Consequently, on-site outsourcing without relocation is neither a sufficient nor a necessary condition for changes in job content. Based on these propositions, the starting point is to consider inter-organisational and intra-organisational spatial restructuring as analytical equivalences to be addressed by our research questions.

It is important to make some additional remarks at this stage. Firstly, since both domestic and international relocations may be included in the empirical design, our study does not specifically focus on economic globalisation. Relocations to international destinations (offshoring) have given rise to wide-ranging strands in sociological, management and organisation research, for example into cultural differences and language barriers, the role of time zone differences, HRM for expatriate staff, the role of differences in regulations and institutional regimes in the choice of location, etc. Our study does not address these aspects. Next, our focus is on the organisational processes of relocation as a 'change'. We do not attempt a full description of the spatially distributed production process of a particular good or service. This study is not about mapping global value chains but about the relocation of some of the activities of which they are composed. Finally, we do not make an a priori selection of the type of activities that are relocated. A large number of recent studies have specifically addressed ICT-enabled business services, with particularly intensive research on the subject of offshoring and outsourcing in the IT sector, based on the role of ICTs in the recent rapid increase in relocations. For the empirical phase of this study, the selection of activities will be based on the theoretical arguments developed in Chapter 2. In conclusion, while this study is inspired by the recent intensification in the outsourcing and relocation of activities and by the growing strands of literature and research that describe those phenomena, it will focus on corporate restructuring events that involve the spatial restructuring of a range of activities.

We now turn to the exploration of strands of research which may be relevant to our study. Starting from a broad approach to our research theme, our initial interest covered both theories on inter-organisational relations and theories on the division of labour. A lot of theories for which inter-organisational relations provide the key theme adopt the perspective of economic relations between organisations and investigate the collaboration between economic actors which are, it is generally assumed, also geographically dispersed. The first paragraph of the next section looks at the theories and research into such inter-organisational relations. The second paragraph explores theories on the division of labour.

1.2 Theories to understand inter-organisational relations and the division of labour

Economic theories on the nature of the firm include, by definition, the question of its relations to other firms and to the market, more precisely defined as 'the problem of relative

efficiency of firms and markets as domains of structured economic activity' (Scott, 1986: 215). Similarly, theories on how organisations evolve, their internal division of labour and their relations with the wider economy and society, are core themes in sociology. These two fundamental issues have been - and continue to be - studied in a wide variety of disciplines of which it is not possible to give a full account. In this paragraph we will restrict our approach to exploring the key approaches with the aim of assessing the extent to which they may provide interesting leads for our study and identifying whether they may generate limitations for our particular research focus. The main aim of this exploration is to make explicit what is required of our theoretical and empirical research framework, to assess the contributions from existing theories and empirical work on which we can build to meet those requirements and to clarify the choices that we make in these areas.

1.2.1 Inter-organisational relations

1.2.1.1 Economic and management theories and research on inter-organisational relations

It has already been stated that inter-organisational linkages are a core theme of interest in economics. These approaches look at organisations and their behaviour from an economic perspective. Explicit references to work, labour processes or relations between management and workers are generally absent or do not constitute major points of interest. We will now briefly consider the major theories. Economic theories mainly construct explanations for the role of transaction costs and facilitated access to resources in interfirm collaboration. The neo-classical approach adopted by theories of transaction cost economy has provoked considerable debate within the discipline of economics, but the notion of transaction costs itself has moved far beyond this and is also used in organisation theories (Ramioul & Huws, 2009a: 26ff). The transaction cost approach, like other strands of the theory of the firm, focuses on the organisation of production from the perspectives of its contractual basis and of economic exchange, and thus addresses the direct relationship of the organisation with the market. The central premise of this theory is that companies make organisational decisions of the 'make or buy' type with the aim of minimising transaction costs (Williamson, 1981). In a nutshell, these transaction costs are determined by the degree of specificity of the asset that is the object of the transaction, where high specificity may induce opportunistic behaviour by economic agents. A second factor is the degree of frequency of the transaction, which is related to the specialisation of the economic agents. The third factor influencing transaction costs is the degree of uncertainty, determined by the information available to the economic agents involved in the transaction. It is now argued that intensified outsourcing of business services is related to the expanded use of ICTs because these are responsible for the reduction of transaction costs by lowering asset specificity, increasing transparency and reducing uncertainty (Ramioul & Huws, 2009a: 21). Transaction costs have been acknowledged as a major factor in the theoretical framework to explain different types of governance in global value chains (Gereffi, Humphrey & Sturgeon, 2005; Maenen, 2010). This approach is limited to explaining the rational behaviour of economic actors. A strict focus on prices, contracts and performance is adopted which involves generally disregarding the fact that the organisations and their relations with other organisations are institutionally embedded in a 'mix of legal, economic, social and political relations' (Granovetter, 1982; Grimshaw, Willmott & Rubery, 2005: 39ff).

Other economic theories have gradually refined and diversified insights into inter-organisational relations by identifying different patterns of relations, their functionality, the role of

technology and innovation, and so on. Authors subscribing to the resource-dependency theory emphasise that organisations are dependent on resources that are only available in other firms, which is why they need to exchange with those firms (Perrow, 1986). This gives a more prominent place in the analysis to power differences between organisations (Augustsson, 2001: 7). Other research looks at the importance of interfirm collaboration in relation to innovation in products and processes (see for instance Lam, 2003; Lissoni, 2001 as examples of case studies on this theme). Other strands, such as resource-based theories, have broadened this perspective by addressing interfirm relations from the point of view of access to capabilities (Barney, 1999). Some of these studies argue that organisation-specific, uncodified knowledge should be identified as such a capability that cannot be accessed unless collaboration with these firms is set up. Knowledge is defined as a particular type of asset and resource that requires specific forms of interfirm collaboration, relying on trust and long-term collaboration (see for instance Adler, 2001; Schamp, Rentmeister & Lo, 2004; Dibbern, Chin & Heinzl, 2005; Petersen, Pedersen & Sharma, 2008). In a recent study on cross-border software development, Maenen (2010: 107) asserts that transaction cost economics is problematic in explaining some types of longer-term inter-organisational relations, particularly those where knowledge and complexity matter and under conditions of technological and environmental uncertainty. This is explained by the fact that the transaction cost economy approach does not account for trust as a basis of long-term trade relations, where contracts are not necessarily the most appropriate way to prevent or temper opportunistic behaviour. In contrast, acknowledging that trust is rooted in a mutual influencing process involving social interaction and joint action makes it possible to take account of the social embeddedness of organisations and the relational aspect of trading relationships. It is thus useful to complement the strictly economic perspective with a more sociological one, which is provided - amongst others - by the approaches that will be presented below.

By acknowledging the existence of long-standing relations between organisations, Powell (Powell, 1990) laid an important foundation for growing theory-building and empirical interest in networks. In this research, networks are conceptualised as: '(...) not network as relation but as a form of organisation or authority itself' (Augustsson, 2001: 8). Networks are identified as important, among other factors, for jointly developed product or process innovations. Adjacent to network research is research on clusters and industrial districts, emphasising the regional or geographical dimension of intensive collaboration between organisations (Piore & Sabel, 1984). Zaheer, Gözübüyük and Milanov (2010) provide a meta-analysis of a variety of network theories and research. A key feature of this type of research is: 'As such *[and in contrast to neo-classical economists - M.R.]* the network approach changes the perspective from an autonomous, self-reliant view of organizational action and outcomes to one that is essentially relational' (*ibid.*: 62). The authors observe that networks are studied at very different levels of analysis, such as the individual or interpersonal level, group, firm, industry and country. When focusing on the inter-organisational level, the literature has identified a variety of 'ties' that constitute the relationship between the organisations, such as strategic alliances, buyer-supplier relationships, director interlocks, investment banking ties, personnel movement links, and cross-patent citation ties (*ibid.*). The core of the theory is that these ties, their structure, content and strength, influence the behaviour of organisations. In other words, they either empower or constrain the performance of firms. The network approach therefore aims to add explanations to organisational behaviour and performance which are derived from the embeddedness of the organisation in a network of relations with other organisations. The mechanisms underlying the inter-organisational networks identified in the literature analysed by Zaheer are: networks as resource access, as a source of trust, as a tool for power and control, and as a 'signalling' mechanism (*ibid.*: 65).

When differences in the power and dependency of organisations of a network are included as a factor in the analysis, imbalances in the distribution of risks and gains amongst the network members can be addressed (Augustsson, 2001). The cited study by Maenen, for instance, observes power struggles between individuals and units participating in cross-border software development projects. These power struggles occur both in intra-organisational and inter-organisational project work and give substance to the codification of the goals and means of the development projects (Maenen, 2010: 251ff, 263ff). The advantage of analysing power relations is that it becomes possible to take into account the character of inter-organisational collaboration as a process and its evolution over time, under the influence of the interaction and agency of the agents involved. In general, studies chiefly refer to power and control as operating between economic agents and/or between the units of one organisation. Power relations between management and workers as defined within the employment relationship are often not addressed. This employment relationship is of key interest for the present study as will be clarified in this chapter.

The criticism that employment relations are absent from research on inter-organisational relations is clearly stated in a study on the impact of inter-organisational networks on work. Grimshaw, Willmott and Rubery (2005: 44-46) postulate that network studies have an ambiguous position with regard to the role of employees. Network theorists claim that the emergence of networks is a fundamental shift in industrial organisation on the basis of a range of assumed benefits, leading to superior performance as compared to the vertically integrated firm. On the one hand, employees are identified as making essential contributions to this performance of the network since the benefits are often explicitly related to the specific way in which work is organised: high-trust relations, teamwork, bottom-up innovations based on the learning organisation model, etc. On the other hand, an acknowledgement of the antagonistic relationship between labour and capital, which should be regarded an essential element in understanding managerial strategies, is absent. As we will elaborate further in this chapter, we set out from the premise that managerial strategies combine mechanisms of both control of and collaboration with workers (Thompson & Newsome, 2004: 135) in the labour process under capitalism. The role of these mechanisms is the main argument on the basis of which Grimshaw, Willmott and Rubery wish to 'bring work back' in the analysis of networked forms of organisation: 'its *[i.e. labour MR]* inclusion is necessary also because it represents a fundamental dynamic - between organizational structure and the contradictory capitalist employment relationship - whereby employers seek to mobilize its capacities by pursuing relations of cooperation on the one hand, but also by engendering relations of tension and conflict, on the other. This contradictory dynamic is already multifaceted within the single organizational form, but additional levels of complexity arise within the network form' (Grimshaw, 2005: 60). In other words, the authors argue that the advantages of the network organisation cannot be fully understood without acknowledging this complexity in employment relations under capitalism (*ibid.*: 44-46).

A brief exploration of the broad field of theories on the economic linkages between firms and on networks suggests that it is necessary to draw on other theoretical perspectives if we wish to focus on the spatial division of work and if we aim to look specifically at the role of employment relations. The primary concern of economic and network theories is to identify different drivers and antecedents for inter-organisational collaboration and the establishment of networks (control of transaction costs, access to resources, increasing power and control over economic behaviour, establishing trust) to explain the behaviour of the organisations involved in these networks and consider the effects of these linkages on economic and company performance. In contrast, our primary interest is to understand how tasks are redistributed between spatially dispersed workplaces. The above theories, despite their value in

explaining inter-organisational relations, do not offer us adequate footholds in order to gain an understanding of inter-organisational collaboration from that perspective. Furthermore, economic theories do not initially address the complex relations between management and workers, rooted in the employment relationship, as a factor potentially influencing spatial restructuring processes and their outcomes.

Although this is not their aim, this latter observation may raise questions about the implicit position that is assigned to the workers actually working in the organisations that are studied. Generally speaking, it seems that workers are implicitly considered as operating unconditionally and in line with the organisation's objectives as set out by management. This social context is neglected especially in rational-economic approaches (Müller-Jentsch, 2004: 20 & 30). Theories such as the resource-based view of the firm, in which employees are explicitly addressed as unique resources for the company, do also have a functionalist approach, however, which may be criticised for its lack of attention to the complex and antagonistic dynamics of employment relations. Doorewaard and Benschop (2003: 275) formulate this critique by demonstrating how employees are regarded as 'resources' in this approach: '(...) based on a simple input-throughput-output (ITO) model, *i.e.* a power-neutral set of coherent decisions taken by rational thinking managers. (...) It *[this approach]* also fails to address properly the complex power-based and chaotic relationships between the system and its environment'. From the perspective of a critical sociologist, such a power-neutral approach is rather sterile in relation to the reality at the shop floor: a reality where cooperation and compliance coincide with resistance and conflict.

In this perspective the labour process is central, which can be defined as 'the location where the specific set of relations between capitalists and workers is produced, reproduced and transformed' (Fleetwood, 2004: 45). The labour process is, thus, as Edwards argues, the place where 'managers and workers meet in a relationship of "structured antagonism" and they define themselves in this relationship: there can be no manager without a worker, and the basics of social class lie in the dynamics and contradictions of the relationship (Armstrong, 1989 & 1993)' (Edwards, 2010: 35). Setting out from this approach it is argued that managerial control, the agency of workers and the complex and contradictory interactions between them play a fundamental role in shaping and reshaping labour processes. Without reducing all organisational behaviour and power struggles to class relationships, the employment relationship under capitalism can be considered on this basis as a key determinant of organisational dynamics.

One objective of this study is to investigate these strategies and agency of management and workers, as structured in the employment relationship, with regard to the process and outcome of spatial restructuring. Our aim in doing this is to open up the analysis of inter-organisational relations to the labour process perspective, based on the view that this may be valuable for the purpose of understanding the mechanisms behind these 'capital-capital' relations (*ibid.*: 59). Such a labour process analysis implies: '(...) an empirical interest in the experience of work at the point of production and a theoretical concern with the contradictory relationships between capital and labour' (*ibid.*: 42). In contrast to a rational choice perspective, this option explicitly addresses and includes the agency of workers in interaction with management. This theoretical approach will be further elaborated in the last section of this chapter.

1.2.1.2 Sociological and organisation research on inter-organisational relations

Economic linkages between organisations and networks are also addressed according to different strands of theory of sociology, organisation and industrial relations. In addition, there is a growing literature in labour geografy which addresses aspects of employment relations in

value chains (see *e.g.* Robinson, 2010; Riisgaard & Hammer, 2011). A valuable overview of the first strand of research is provided by Thompson (2005). He draws attention to institutional approaches to networks, the role of globalisation and technological developments and studies emphasising the 'embeddedness' of the actors, as illustrated earlier. Another strand of the literature concerns research into multinational companies and firms operating globally, where human resource practices and industrial relations in international organisational environments are key themes (see for instance Morgan, Kristensen & Whitley, 2003; Bronfenbrenner, 2007; Edwards *et al.*, 2007). Looking only at research specifically focusing on inter-organisational networks, some recent studies offer illuminating examples in that they include the perspective of work and employment relations in new, networked forms of organisation. Their (common) conclusion, briefly stated, is that the organisation as a single, physically distinguished entity is no longer the unique level at which work and employment relations are shaped and regulated. The perspective of such studies sees individual or collective employment relations in different situations in terms of the contractual forms of collaboration between organisations, rather than focusing on the spatial (re)distribution of work as such. We present four studies in more detail.

First, the study by Marchington *et al.* (2005) offers relevant insights into the impacts of inter-organisational relations on employment. This research concerns a set of case studies brought together in a book called 'Fragmenting work, blurring organisational boundaries and disordering hierarchies'. The authors investigate different forms of contractual collaboration between firms: agencies, franchising, outsourcing, multi-client sites, supply-chain partnerships, multi-employer sites, public-private partnerships and transfer of undertakings. The main conclusion is that networked forms of organisation lead to fragmentation in the way work is managed. The contractual forms of interfirm collaboration that were studied lead to the 'blurring of organisational boundaries' in different ways. Firstly, employees may work in organisations where it is not always clear who the employer is (*e.g.* in secondment situations) nor who gives the orders (*e.g.* in call centres working for different clients). This leads to triangular or even rectangular relations. Employees may also participate in teams involving different firms (*e.g.* in so-called virtual teams, project work). Secondly, different actors may influence power relationships within a single organisation, particularly clients but also suppliers or subcontractors, *e.g.* by imposing Service Level Agreements, quality labels, etc.

The authors describe this range of situations as 'multi-employer environments' leading to fragmented work in the sense that the employment relationship is no longer confined to a single, well-delineated company. The result is a more complex and diversified way of managing the employment relationship, which makes it more difficult to localise power. In their research the authors analyse the impact of networked forms of organisation on a wide range of employment aspects, including employment relations, human resource management, contracts, etc. The authors conclude that some regulatory aspects of hierarchical structures are becoming inadequate, for instance career paths, wage structures and forms of employee participation. They also note the emergence of new mechanisms of disciplining employees, which are related to growing organisational complexity. This complexity entails greater insecurity about the performance of employees and thus requires a more explicit policy on risk in regard to those employees, for instance through contractual regulations between the organisations in the network, through procedures and requirements (such as Service Level Agreements), through ICT-supported surveillance tools, etc.

A second study was based on the WORKS project, which is also the key reference project for this study. Using the term 'Fragmenting Labour', Flecker (2010) demonstrates how different forms of global value chain restructuring are contributing to increasing diversification of working conditions within countries, sectors and organisations. Global value chain re-

structuring events, such as the outsourcing and relocation of work, and also triangular and rectangular employment relations and multiple forms of employment within a single firm, all imply a growing diversification of both employers and locations which has an impact on the regulation of employment conditions. The fragmentation of employment refers not only to increasingly different employment conditions between countries and regions but also to the fact that: '(...) different employment relations and conditions apply to workers carrying out tasks that were previously, or partially still are, performed within the client organisation. Fragmentation of employment may, however, also mean that employment relations become heterogeneous within a single organisation' (*ibid.*: 16).

Another study focusing on employment relations within inter-organisational relations is the Re-Lier project. In its empirical investigations it identifies different types of networks based on different forms of hierarchical and legal collaboration between firms (internal network, mobile network, integrated network, etc.). The aim is to analyse the impact of these networks on collective employment relations (Xhauflair, 2003). They conclude that market relationships are increasingly 'internalised' within organisations. This leads to a triangulation in employment relations: rather than concerning employer and employee, the employment relationship is increasingly based on a triad of the employer, the employee and a third party usually connected via market mechanisms (clients, suppliers, etc.). This is caused by a dissociation of hierarchical structures into legal power, economic power and functional power, each of which resides with different actors, thus making the employment relationship hybrid and complex. The main emphasis in this research is on the impact of different network forms on the structures and practices of social dialogue.

Finally, a study by Weil (2009) focuses on the regulation of work in the US in certain sectors that are characterised by complex, inter-organisational interdependencies. Weil identifies four different sectoral patterns of interdependencies between firms resulting from corporate strategies such as outsourcing. These interdependencies are contributing to the breakdown of the traditional employment relationship and resulting in a more vulnerable workforce in terms of contracts, wage benefits, unpaid overtime, occupational health and safety risks, etc. (*ibid.*: 418ff). A first type is called 'Strong Buyers Sourcing Products in Competitive Supply Chains' and concerns the dominance of major players in product markets, mostly large retailers but possibly also producers, which define the conditions for the economic relationships in supply chains without having responsibility as an employer for the large number of other firms in the supply chain. The second type is called 'Central Production Coordinators Managing Large Contracting Networks'. This type covers sectors where large numbers of employees are involved in producing a product but few of them are directly employed by the 'coordinators'. Instead these employees are involved through various tiers of subcontracting. This is the case for instance in the housing industry (working with a large number of small and competing construction firms) or in transport and logistics. A third type is 'Small Workplaces Linked To Large Branded National Organisations', such as large hotel or fast-food chains. The system of franchising or other complex combinations of local ownership and third-party management may result in precarious employment conditions in the large number of dispersed local branches that sell the branded products or services. The last type 'Small Workplaces And Contractors Linked Together By Common Purchasers' refers to a purchaser of services, either public or private, that contracts out activities to a large number of competitive contractors. The common purchaser distributes payments to these employers, which operate in more competitive markets than the large purchaser. Home care or janitorial activities are cited as examples for this type. Since these types of sectoral configuration imply divergent employment conditions in the different firms within the sector, specific work

regulations at the sectoral level rather than at company or national level, are needed if increased vulnerability of the workforce is to be prevented.

These four studies explicitly address the employment relationship in different contractual forms of inter-organisational collaboration. The first study emphasises the legal-formal aspects of the individual employment contract. It covers several aspects of personnel management when investigating the impacts of multi-employer organisations, comparable with the study of Flecker (2010) who chiefly focuses on the impact of value chain restructuring on employment conditions. The third study broaches the impact of different network forms on industrial relations and the social dialogue. The last one looks at the 'breakdown' of employment relationships and employment conditions in relation to differences in the power and competitive position of large, concentrated businesses and the numerous smaller firms with which they trade. Changes in the contractual dimension of work, the (individual) relationship between employee and employer, and employment conditions are central to the analysis of these studies. These changes are related to economic forms of collaboration between firms (such as outsourcing). These may or may not involve spatially dispersed work. The way the tasks are actually (spatially) organised is not the central point.

This is once again a different focus from the one we wish to adopt in this study. Alongside assigning a central place to the employment relationship, which we mentioned as a first key research objective, a second objective is to add value to the above sociological approaches by primarily analysing the tasks that workers carry out and how these are spatially restructured, rather than investigating the contractual employment conditions of the workers. This second objective leads us to the theme of the division of labour.

1.2.2 The division of labour

1.2.2.1 A long tradition in sociology

Since our interest is in actual tasks and job content, the division of labour is a theme of key relevance. Theories concerning the division of labour are crucial in order to understand the organisation of work and changes in it, which is evident from the fact that this has been a central issue in theories on organisations and work since the early origins of sociology: 'Since division of labour is present in all forms of (organised) production, it facilitates comparisons both between firms, industries, cultures and over time. Furthermore, division of labour is implicitly or explicitly present in all previous models to describe the organisation of work.' (Augustsson, 2001: 3). The continuing division of labour is a fundamental trend in the evolution of organisations. The foundation of this trend is the ongoing, gradual separation of work into different tasks and functions that are allocated to individuals or groups or to different units, companies, industries or countries. As far back as Smith, Marx, Weber and Durkheim, theories on the division of labour have evolved in various directions and formed the basis of a variety of disciplines. The historical development of this field of research gradually came to reflect the reality that: 'There are innumerable, different divisions of labour in modern society' (Scott, 1986: 216). The key contribution of Smith's Wealth of Nations (1776) is that it was among the first to describe the division of labour as a strategy to increase productivity, based on the increasing fragmentation of tasks which gives rise to specialisation and the emergence of new trades. For Smith, it is the basis of economic progress. Durkheim's 'moral' analysis of society basically referred to the specialisation of functions in society. By developing his theory on bureaucracies, Weber laid the foundation for understanding both the horizontal and the vertical division of labour in organisations. Scholars such as Mintzberg (1980) and Chandler (1990) followed this line of research by focusing on the role

of the division of labour in the evolution and social shaping of internal organisational structures, thereby laying the foundation for a vast tradition of research in organisation studies. Marx highlighted the rationale of the division of labour under capitalist production relations, leading to alienation, and contrasted it with the emergence of crafts as a more 'natural' development of the division of labour in society. It is an essential feature that in all these sociological approaches the division of labour is conceptualised as socially shaped.

Following the insights of Weber's horizontal and vertical technical division of labour and Marx' analysis of the role of the division of labour in the antagonistic production relations between labour and capital, this issue became a key theme in the sociology of work with Braverman (1974). Braverman used the task as the basic unit of the labour process when he charted how management has developed strategies to separate conception and execution, *e.g.* through workplace observations and time and motion studies, as put forward in F.W. Taylor's Principles of Scientific Management. Taylorist management techniques imply an increasing fragmentation of work into short-cycled tasks based on the standardisation of labour. Braverman's work became a key reference publication in the labour process approach and since then has generated a huge number of studies on changes in labour processes and in work. The influence of his work was crucial in that it repudiated the dominant idea of a general upskilling of the workforce in advanced economies. He demonstrated, on the other hand, structural trends towards downskilling. The debates on upskilling, downskilling and the polarisation of skills are a central issue in industrial sociology to this day (Grugulis & Lloyd, 2010). Due to the central role of knowledge codification in this analysis, we will return to this issue in Chapter 2.

It is important at this point to emphasise that the standardisation of work can also lead to division of labour *between* organisations: 'The point is that once any task has been reduced to standard components or modules, these modules can be reconfigured in a huge variety of ways to suit the particular needs of any given organisation at any particular point in time. The greater the degree of standardisation, the greater the scope for reconfiguration, and the more potentially complex the global division of labour' (Huws & Ramioul, 2006: 7). Sociologists and economists have both long observed that the standardisation of work and labour processes encourages the vertical disintegration of firms (Scott, 1986: 220). Gradually, research into industrial organisations has acknowledged that there may be limits to the increasing division of labour and that corporate strategies of integration rather than fragmentation, and flexible rather than mass production, are increasingly turning out to be more effective and efficient in economic conditions of market saturation and high competition. With the seminal work 'Das Ende der Arbeitsteilung?' Kern and Schumann (1984) initiated a broad wave of empirical research and ongoing theoretical debates in the sociology of work and industrial organisation. This is now commonly referred to as research into new production concepts and on new forms of work organisation. Most of these studies chiefly analyse internal patterns in the division of labour of industrial organisations.

1.2.2.2 Technical and social division of labour

Due to its long history in sociology, the division of labour is associated as a concept with a broad range of organisational and societal processes and developments. Essentially it is possible to distinguish between a technical and a social division of labour. The technical division of labour refers to the physical separation of the tasks in a production process. In the technical division of labour, a distinction is often made between the horizontal and vertical division of labour. The horizontal division of labour is about the increasing number of tasks and functions into which a process is divided, while the vertical division of labour refers to the increasing number of hierarchical levels (Augustsson, 2001: 11). In a subsequent section of

this chapter, we will propose a scheme to empirically observe and analyse the technical division of labour. The social division of labour concerns the differentiated allocation of these tasks to individuals, groups, units, organisations, industries and countries.

The key is that, both theoretically and conceptually, the technical and social division of labour are distinct, generic mechanisms and their actual manifestations are contingent. The particular outcome of the social division of labour is contingent on the complex conjunction of a range of social mechanisms that influence the allocation processes of a particular technical division of labour. The actual outcome of the division of labour in terms of social division into organisations and within societies is, in other words, an empirical question.

Although the social division of labour is often considered at the societal level, the distinction between the technical division of labour, as the material separation of tasks, and the social division of labour, as the allocation of those tasks, should not in fact be confused with the distinction between the division of labour at the organisational level and at the societal level. Both forms, the technical and the social division of labour, can be identified within organisations as well as in the wider economy and society. Within an organisation, the combination of the technical and social division of labour results in an internal configuration of horizontal/divisionalised and vertical/hierarchical functions, as well as in internal 'labour markets' regulating the allocation of workers to these. Since the expansion of firms has historically been based on an increasing division of labour, the patterns of allocation gradually become more complex and lead to differentiations in terms of skills and hierarchy which are reflected in occupational and professional structures. At the level of the society as a whole, these combined and increasing technical and social divisions of labour lead to specialisation in sectors and to occupational differentiation (Fernandez-Macias, 2010: 17) which culminate in differentiated economic structures, employment structures and labour markets. Consequently, processes of technical and social division of labour produce social divisions in society. The analysis of the social division of labour at the societal level has generated important bodies of literature, for example on the gendered division of labour, patterns of labour market segmentation, social stratification and the international division of labour.

At the level of the organisation, which is where our study is focused, the social division of labour includes distinct allocation mechanisms aimed at assigning tasks to workers. At this stage we can identify three key allocation mechanisms. The inter-organisational division of labour is based on the contractual allocation of work to different organisations and establishes economic collaboration between them. Outsourcing and other modes of inter-organisational collaboration thus produce a division of labour between organisations. In this way the inter-organisational division of labour reflects the increasing complexity of economies where 'particular labour processes break institutionally away from another and become re-established in individual firms linked across a market' (Scott, 1986: 218). The spatial division of labour results from geographical shifts in activities. The growing importance of geography in the capital accumulation process leads to an increasing spatial division of labour that is spreading around the globe (Rainnie, McGrath-Champ & Herod, 2010: 301ff). As a result of both allocation processes, the production of goods and services increasingly extends beyond the single firm. The temporal organisation of work can also be regarded as an allocation mechanism of the organisation generating the social division of labour, because production processes may be organised according to different temporal arrangements (in daytime, in shifts, in a 24/7 production scheme, etc.).

The specific combination of these allocation mechanisms defines the relations between workers and the jobs that result from a specific technical division of labour. This implies that, although the technical and the social division of labour are theoretically and conceptually distinct, in reality they are not totally independent. A specific technical division of labour

is likely to influence the actual choices of organisations regarding the allocation of work to third companies (for instance because there are no capable organisations available for that type of work), to specific geographical locations (for instance because of characteristics of the local labour market such as the (un)availability of a skilled workforce) or to certain time arrangements (for example because the technical division of labour implies collaboration extending across different time zones). Similarly, the specific social division of labour in an organisation may limit the scope to change the technical division of labour, for instance because part of the work is situated in other firms or regions and cannot easily be brought back. In other words, the technical and social division of labour have a mutual conditioning influence. In addition, the various allocation mechanisms are not completely independent of each other. It is notable that the inter-organisational and spatial division of labour have important consequences on the institutional environment and social context in which work will be carried out and may therefore influence choices in the area of temporal allocation. Generally speaking, this temporal allocation may be regarded as contingent on the decisions made on the contractual and spatial allocation. From now on this dimension will be mostly left out of the analysis. Questions concerning the relative priority of the contractual *versus* the spatial allocation and their possible interdependency, on the other hand, remain unresolved at this stage and are probably empirical in nature. Following our decision to concentrate on spatial restructuring events irrespective of their economic governance mode, we posit as a point of departure that the inter-organisational and the spatial division are two mechanisms that do not necessarily coincide. In this respect, we follow Rainnie, McGrath-Champ and Herod (2010: 301ff) who state that production processes may be (and increasingly are) spatially distributed even if they are still organisationally integrated.

In sum, the aim in the present study is to clarify the relationship between the technical division of labour and the spatial division of labour as a constituent dimension of the social division of labour. The key question is to what extent changes in the spatial allocation, such as those that come into being in relocation projects, are implemented independently from the technical division of labour. If they are, spatial restructuring may, for instance, imply a simple 'lift and shift' of work to another destination company without any further impact on the work itself. Or is the opposite true: that such spatial restructuring projects necessarily entail changes in the technical division of labour? If that is the case, how exactly are these changes then related?

1.2.2.3 The coordination issue

Rainnie *et al.* and Augustsson both draw attention to a key issue in the different forms of division of labour: 'What are the relations between the divided functions and how are they integrated again?' (Augustsson, 2001: 12). Dividing tasks within a process simultaneously implies coordinating where there are interdependencies. When considering coordination, a distinction is made between economic coordination or governance, which refers to the contractual dimensions of trade relations between firms involved in the production flow (as set out above), and functional coordination, which refers to the organisational and technical aspects of integrating the different steps in the production process. Marx already emphasised that there is a fundamental difference in how the division of labour is coordinated within an organisation and between organisations (Fernandez-Macias, 2010: 15ff). He argued that the division of labour in society is based on markets and prices of commodified products, while the division of labour in organisations is shaped by the power relations between labour and capital and based on the commodification of labour power, which is not a commodity of the same type as material products. According to Marx, the fundamental difference is that the division of labour within firms is coordinated on the basis of power and centralised, con-

scious coordination related to ownership, while the division of labour between firms is coordinated on the basis of decentralised, spontaneous price mechanisms. Coase, one of the founding fathers of theories of the firm, also emphasised the fundamental difference between the coordination of transactions between companies based on the market, *versus* the coordination of production within companies based on authority (Coase, 1996 cited in Fernandez-Macias, 2010). The argument is that the key dimensions of economic coordination are regulated in contractual terms and that monitoring of compliance in this area by all parties is systematic. The structure and monitoring of coordination, however, 'tends to be sporadic in nature and occur at the level of senior executives and corporate lawyers' (Mirani, 2007: 17).

In addition to the fact that inter-organisational division of labour requires contractual governance, functional coordination is also necessary whenever there is division of labour, and this is not 'sporadic in nature' but a day-to-day, operational activity involving all layers of the organisation. While Marx emphasised the power and authority of the employer, in modern organisations this internal coordination can be described in terms of 'organisation', covering a range of bureaucratic, human resources and technical infrastructures and arrangements. These include a whole set of measures enabling the sharing of resources and information between interdependent activities. Examples include the sharing of staff (staff exchange, employee mobility), infrastructure (machines, ICTs), technical and administrative procedures (quality standards, communication protocols, etc.) and so on. These organisational coordination infrastructures and arrangements enable the organisation to realise its goals (Achterbergh & Vriens, 2009: 192ff). Achterbergh and Vriens (2009: 194) refer to the organisation theory of Beer, who refers to coordination of interdependencies between the primary activities of an organisation as a necessary function of the organisation. Mirani (2007), in turn, labels this as 'procedural governance' as distinct from economic governance. We may also speak about the functional coordination of the production flow. Unlike economic, contractual governance, functional coordination has a process-oriented perspective and involves all hierarchical layers down to the operational staff in the organisation (*ibid.*: 17). In the case of labour processes that are spatially dispersed between several units belonging to one organisation, such functional coordination mechanisms are complex and require explicit attention from the management (Mirani, 2007; Ramioul & De Bruyn, 2008; Flecker *et al.*, 2008; Rainnie, McGrath-Champ & Herod, 2010; Maenen, 2010: 223ff).

When considering the two-sided coordination issue, simplified dichotomies such as those originally put forward no longer seem tenable in the complex organisational and economic environment in which organisations operate today (Augustsson, 2001: 14ff) because organisations are no longer self-contained and markets are no longer pure. Economic coordination has become complex and functional coordination is, generally speaking, no longer an intra-organisational matter. The distinction between 'market' and 'organisation' has become more ambiguous due to the growing interference of third parties in the internal organisation, as the earlier cited studies of Weil (2009), Marchington (2005) and Flecker (2010) also demonstrate. To summarise one of these, Weil (2009) identified different configurations of the sectoral division of labour where the dominance in economic relations of one large company has a far-reaching impact on the regulation of work in a large number of dependent firms. The coordination of such divided processes may perhaps still be effectuated through trade relations but these can no longer be described in terms of 'spontaneous decentralised price mechanisms'. Specific contractual arrangements between firms such as Service Level Agreements result in client-organisations and customers having a growing impact on internal aspects of the organisation, which may include the way production processes are shaped and

workers allocated. In other words, it seems that elements of functional coordination are increasingly penetrating into contractual coordination and vice versa.

In general, these developments are reflected by the fact that the role of capital markets and financial capitalism, driven by the pursuit of shareholder value, are increasingly being addressed in labour sociology studies (Thompson & Smith, 2010: 18). A prominent example here is Sennett's 'The culture of the New Capitalism' (Sennett, 2007), in which the author describes the key characteristics of new capitalist cutting-edge companies in contrast to traditional, vertically structured bureaucracies. Sennet demonstrates how the major orientation of the new corporation towards short-term shareholder profit ('impatient capital') not only has profound implications for overall company policy but also deeply affects workplaces, individuals and relationships at work.

The accelerated globalisation and lengthening of value chains has certainly created greater interest in the relationship between contractual coordination and functional coordination and the mutual impingement of organisational and economic boundaries. It is a prominent theme in the literature on offshore outsourcing in IT, also because IT activities can generally be characterised as complex, knowledge-intensive and highly interdependent which creates explicit requirements for the two-sided coordination (Mirani, 2007: 216, 217). In general, the economic literature still tends to argue that inter-organisational configurations fundamentally differ from intra-organisational modes of organisational coordination (Maenen, 2010: 240). Research has shown, on the other hand, that similar functional coordination mechanisms are being implemented in inter-organisational and intra-organisational governance and these affect all levels of the organisation, including the operational level. In other words, while contract-based types of relations form the basis for outsourcing arrangements, they also require explicit investment and effort to secure the functional coordination of dispersed but interdependent activities and to bridge distances, especially in cases of international outsourcing or in a context with complex modes of collaboration.

In his study on cross-border software development projects, Maenen observes specific coordination interventions such as the creation of boundary-spanning functions and different types of informal work practices. The author further argues that relocation combined with outsourcing can be expected to add complexity as compared with in-house relocation (*ibid.*: 241). This additional complexity is not related to the nature of the production structure itself but is caused by the contractual boundary which limits the diffusion of knowledge and information between the actors involved. According to this author, functional and hierarchical boundaries already impede the efficient information exchange required in technically divided production structures and contractual governance adds an additional barrier (*ibid.*: 220). Nevertheless, due to the need for functional coordination wherever there is division of labour, Maenen (2010: 240) concludes: 'Logically then, there is no epistemological necessity to devise separate explanatory frameworks for understanding interorganizational production processes, since the causal mechanisms that are at play are in many ways identical to the processes that can be found in intra-firm interdepartmental settings'. In the literature on this subject, Mirani comes to similar conclusions on the basis of a literature study on the offshoring and outsourcing of IT work when he compares both inter-group and inter-organisational coordination of dispersed software activities in his own research (Mirani, 2007: 219). This conclusion supports the choice made in this study to investigate spatial restructuring as a process under different economic governance modes. The decision to use the tasks making up a production process as the unit of observation and analysis places the mechanisms of functional coordination at the centre of the analysis.

What should we conclude from the insights into the advancement of the division of labour and its coordination? Most importantly, the complex patterns of division of labour within

and between organisations and around the globe call for suitable combinations of both contractual coordination and functional coordination, which involves specific organisational infrastructures and interventions to bridge space and time between dispersed but interdependent activities. In our study we are interested in the technical and spatial division of labour. The first result of this is that we focus our attention on these two mechanisms. The second is that we focus attention on organisational and functional mechanisms for coordinating divided work, rather than on their contractual governance.

1.2.3 Observing and understanding changes in the division of labour

This exploration of some of the major theories on inter-organisational relations and the division of labour leads us on to the next two key steps in our research. On the one hand, we need an analytical framework to observe and describe the technical and spatial restructuring of labour processes. On the other hand, a theoretical perspective is essential in the search to understand and interpret the processes, motives and outcomes of changes in the spatial division of labour. To acquire this, we must clarify the theoretical perspective on restructuring processes.

In summary, the overview of the diverse literature explored in this section demonstrates that, over time, a variety of broad and deep insights, explanations and areas of knowledge are acquired on inter-organisational relations and on the division of labour. Theories and research contribute to understanding why activities may be outsourced or relocated, why networks emerge and how they operate and the resulting impacts on the organisation, its members and their performance. Drivers of collaboration between organisations include control over transaction costs, access to resources, capabilities, technology or knowledge, the realisation of innovations or the establishment of power and control or trust. From a different perspective, strategies to manage the complexity of coinciding and conflicting interests between employees and management are identified as a key factor in the shaping and reshaping of organisations. The sociological studies cited here focus on different forms of contractual relations between organisations and the way in which these impact on individual or collective employment relations. The issue of power, as confined to these employment relations, is then addressed. The theoretical perspective in the present study, which will be elaborated throughout the remainder of this chapter, is rooted in the labour process approach and assigns a central position to the employment relationship as a factor for change in the way corporate strategies such as the relocation of activities are implemented and how they impact on work.

The division of labour, finally, is central to the long-standing sociological tradition of organisation studies and research into work organisation. The key focus here is on the internal dynamics of organisational structures, while other strands consider societal effects of the increasing complexity of the division of labour. Contractual relations and the organisation were both identified as key mechanisms for the coordination and integration of divided processes, while it was acknowledged that they both occur together in the complex division of labour in advanced economies.

All these perspectives and insights are valuable in order to understand inter-organisational relations and the division of labour, but so far they do not equip us with an adequate analytical framework to formally observe, analyse and understand the technical division of labour, in other words to understand whether and precisely how work changes when the spatial division of labour is altered. How is the production process of a good or a service, as a flow of material or information, organised? How are the different functions and tasks designed and related, that is: divided or integrated, and how do they relate to each other? Do these flows,

tasks and relations change when they are entirely or partly reorganised at a distance? Before gaining a theoretical perspective, we need an analytical framework to enable us to describe in a formalised way the technical division of labour and changes here. For such an analysis, we draw on the reference study of Van Hootegem (2000: 18ff, 41ff), who postulates that the construction of a conceptual model to analyse organisations in a pre-analytical phase makes it possible both to reduce the complexity of the social reality, which is a necessary objective of research, and to construct adequate and effective research tools. Such a conceptual model generates formalisation and explicitation procedures, which are important for qualitative research: 'Through the process of formalisation, the researcher attempts to synthesise the information gathered in a systematic way into concepts (or categories of concepts) that can be organised within a theoretical, conceptual framework' (*ibid.*: 19, own translation). Van Hootegem applies this research strategy coherently in his own comprehensive research on new trends in production and personnel management.

In order to find concepts that may pave the way for such an analytical, conceptual model, we turn to global value chain research and to the concept of the business function and assess to what extent we can build on these to define a procedure to formalise our observations. This is done in the next section.

1.3 Towards a model for analysing the technical division of labour

1.3.1 The global value chain and business functions[2]

The research on global value chains that has been stimulated by the current intensified outsourcing and offshoring of ICT-enabled activities is a relevant point of reference for our purposes. Our initial interest in opting for this approach when investigating the spatial restructuring of activities was because of its potential to describe the division of labour of a production process between firms and its focus on the spatial dimension of that division of labour. The EU project WORKS, which used global value chain restructuring as its central focus to study changes in work, serves as the starting point. Studies on company restructuring such as WORKS have been inspired by Global Value Chain theory. This in turn has generated some recent empirical refinements that are of particular interest to us. Economic geographers such as Gereffi and Korzeniewicz (1994), and other scholars involved in the Global Value Chain Initiative (Kaplinski & Morris, 2001) provide key contributions to understanding global value chain restructuring. Originally, the concept used was the global commodity chain, defined as 'a network of labour and production processes whose end result is a finished commodity' (Gereffi & Korzeniewicz, 1994: 2). Central to this is the analysis and description of inter-organisational networks that emerge around the production of goods and link together states, organisations and consumers. The description of the global value chain analyses the links between the different nodes in the production and distribution of a commodity in which each node or 'box' is composed of inputs (raw materials or intermediate products), processing, distribution and consumption. The production process is analysed from three complementary perspectives (*ibid.*: 96). The first is an input-output structure, which is a set of products and services linked together in a sequence of value-adding economic activities; the second is territoriality, which is the spatial dispersion or concentration of production and distribution networks, comprising enterprises of different sizes and types; the third is a governance structure, which concerns the authority and power rela-

[2] A previous version of sections 1.3.1 and 1.3.2 is partly published in Ramioul (2012)

tionships that determine how financial, material and human resources are allocated and flow within a chain. With the increasing complexity of production processes and trade flows and the ongoing globalisation of the economy, the global value chain model has been further refined, distinguishing producer-driven commodity chains, buyer-driven commodity chains and technology-driven commodity chains (Gereffi & Korzeniewicz, 1994: 95; Gereffi, Humphrey & Sturgeon, 2005: 82).

Today, the key reference concept used in this strand of literature is the global value chain which places the emphasis on the economic value that is added by the different activities before a product or service is delivered to the market: 'Each step in the value chain involves receiving inputs, processing them and then passing them on to the next unit in the chain with value being added along the way' (Huws *et al.*, 2009: 25).[3] The term 'value chain' sometimes used synonymously with the overlapping concept of the 'supply chain', was originally coined to describe the growing spatial and contractual complexity of the division of labour in the production of goods but it is now increasingly applicable to services, both public and private (*ibid.*: 25).

The different 'nodes', 'boxes', 'steps' or 'activities' making up the global value chain are commonly defined as business functions. In his book 'Competitive advantage: creating and sustaining superior performance', Porter (1985) focused on business functions as the technologically and economically distinct activities that a company performs to do business and each of which adds economic value to the end product (and therefore contribute to the firm's competitiveness). These business functions are classified into primary activities - production, assembly, transport & distribution, sales, and customer services - and secondary or support activities, which are supportive to the primary process, such as finance and accountancy, HRM, training and product development. The book was meant as a corporate tool for improving the firm's competitiveness based on the analysis of the economic added value of each business function and, in this capacity, it provided a foundation *e.g.* for Business Process Re-engineering. The concept of the business function has recently received renewed academic attention in a number of studies on global value chains and company restructuring. One reason for this revival is that it is put forward as a solution to solve measurement problems in the (statistical) mapping of the employment impacts related to offshoring and outsourcing activities and restructuring global value chains (Sturgeon & Gereffi, 2009). These measurement problems imply that traditional industry classifications using units of observation such as 'the enterprise' or 'the sector' are found to be increasingly inadequate for the analysis of the structure and restructuring of global value chains.[4] Outsourcing and relocation typically involve only specific activities which are moved between firms, rather than whole companies that are moved to other locations around the world. This necessitates empirical observation of the different activities within firms.

Several establishment surveys have introduced the business function as the unit of observation to study offshoring and outsourcing. Under the overall research umbrella 'e-work', the EMERGENCE project (www.emergence.nu) set up a company survey on the relocation of business functions involving information processing and telemediated by ICTs (*i.e.* delivered over a telecommunications link) such as software development or customer relation services (Huws, Flecker & Dahlmann, 2004). Other surveys used sets of generic business functions aimed at covering all activities of companies: Eurostat's International Sourcing Survey (Statistics Denmark *et al.*, 2008), some national establishment surveys like KEROSINE (De

3 In one of the books setting out the conclusions of the WORKS project, a historical account of the various underlying theories behind the concept of the global value chain, which date back to the 18th century economists, is summarised by Huws *et al.* (2009: 11ff).

4 See Huws *et al.* (2009: 19ff) for a summary of the measurement problems of industrial classifications for the study of value chain restructuring.

Kocker & Wynants, 2009; Geurts, 2009), the US Survey of Changing Business Practices in the Global Economy, etc. As well as using business functions in surveys, other studies seek to identify business functions in existing employment databases. The US Bureau of Labour Statistics' Mass Layoff Statistics program derived a list of business processes and business functions from task descriptions collected in data about mass layoffs in the US (Brown, 2008). In the quantitative research of the WORKS project, employment in business functions was estimated using cross-sections of sectoral and occupational employment data (Geurts, Coppin & Ramioul, 2007). In the WALQING project, the latter method was further refined in order to identify job growth and decline at the level of business functions and also to assess the quality of these jobs (Vandekerckhove & Ramioul, 2011a & b). In the qualitative case study research by WORKS, various business functions (production, R&D, logistics, IT services, etc.) were selected to be used as 'windows' to look at global value chain restructuring in different industries and in a comparative perspective across the EU (Flecker *et al.*, 2008).

As a result of these research efforts there are several different ways of clustering activities into business functions and classifying them (Vandekerckhove & Ramioul, 2011a).[5] When considering these academic efforts and their outcomes, the merits of the global value chain approach and the business functions concept should not be underestimated. They make it possible to shift the focus from the physically delimited organisation to steps in the production process that are not necessarily organised at one location or in one contractual relationship. Attention can thus be shifted to how work and employment are organised and reorganised at the level of the entire value chain and at the level of each of its component business functions (Ramioul, 2008: 24). These perspectives therefore add value to research on work and employment in a globalised economy.

We argue, however, that the use of the business function concept to understand changes in work related to spatial restructuring necessitates a critical assessment of both its theoretical assumptions and its empirical merits. More specifically, the question addressed in our study concerns the extent to which the business function concept enables us to better analyse and understand possible changes in the technical division of labour related to spatial restructuring.

Generally speaking, it is interesting to observe how concepts such as global value chains and business functions, originating in diverse disciplines, are finding their way into a range of international research projects concerned with economic globalisation in general and corporate restructuring involving outsourcing and relocation in particular. These projects attempt to empirically refine definitions and concepts which are useful to understand current trends, in this case the concept of a business function, and to apply them in an innovative way in research on changes in work. For this type of collaborative research it is essential to construct powerful analytical concepts that can be applied to empirical data collection processes in highly different contexts such as the EU member states. Empirical innovation may therefore be one of the great merits of funded international research projects, especially if consecutive projects are possible. In this capacity, international research projects are proving their value as types of applied and policy-oriented research. They are typically required by the commissioner of the research to facilitate a policy-relevant outcome and dissemination to a variety of stakeholders and audiences. Partners often come from diverse research backgrounds and adhere to different theoretical perspectives and research paradigms. They have

5 Gospel and Sako (2010: 5) also argue that primary functions add economic value to the product or service as 'components', while support functions are business processes that are normally viewed as part of the administrative overhead. On this basis they distinguish vertical disintegration of the value chain, the outsourcing of primary functions, from the unbundling of corporate functions, which refers to the outsourcing of support functions, such as HRM.

to collaborate as effectively as possible in what is often a temporary and to some extent even randomly composed research consortium.

However, while such projects eventually culminate in very enriching research environments and often gather extraordinarily vast funds of empirical data, a feat that cannot be achieved within the confines of a single research institute, this may often be at the expense of theoretical depth. The constraints of time, funding and contractual limitation to certain objectives in large-scale projects of this type often mean that the time needed for theoretical reflection is lacking. That is necessarily left to be taken up subsequently by individual researchers, depending on local opportunities. The empirical legacy of the WORKS project in particular is too valuable not to take such an opportunity while it is available. The main objective of WORKS was to investigate changes in work related to global value chain restructuring, focusing on a wide range of work-related themes such as work organisation, skills, flexibility, and the quality of work, social dialogue and employment relations. This study is directly linked to WORKS and we will make use of its empirical data to investigate our research questions. It is important to emphasise at this point that the efforts, commitment and work of all the partners involved in the WORKS consortium deserve the credit for the overall project outcome on which we build.

1.3.2 Is the business function concept valuable for our research?

Three main questions can be considered with regard to the use of the business function as a concept for research. The first relates to the empirical observation of business functions, the second concerns the underlying managerial rationale in shaping business functions, and the third addresses the relationship between the business function and the organisation.

One initial concern that emerges from the range of studies is that the empirical observation of business functions appears to be less than straightforward, whether it is done quantitatively or in qualitative research. In quantitative analysis, current efforts have sought to overcome the fact that the available statistics do not include the business function as a level of observation. When using employment data, the proposed approach is to group together the occupations observed in a particular sector on the basis of their description within the occupational classification system and to use these groupings as proxies for business functions. To give a cursory illustration of this: employment data may allow a division into the business functions of manufacturing (grouping together all manufacturing occupations), administration (all clerical workers and management functions), sales (all sales-related occupations), etc. In a next step and insofar as the data source permits, job quality indicators can add information on these occupational groups - which are thus called business functions - and a range of comparative analyses become possible. For instance, it can then be observed that there are more temporary contracts in 'sales' than in 'administration' in the Hotels and Restaurants sector, or that there are more in the sales function in Hotels and Restaurants than in the sales function in Manufacturing Industries. This bottom-up method is first used in the quantitative analysis of WORKS (Geurts, Coppin & Ramioul, 2007) and further refined in the WALQING project (Vandekerckhove & Ramioul, 2011a & 2011b).[6] As the example makes clear, this method is highly dependent on the quality of the occupational data, the classification system used and the information which it contains.[7] In this approach, business functions are used at the sectoral level rather than the organisational level. Another approach, typically

6 Brown (2008) uses a similar bottom-up approach by constructing business processes from task descriptions in the Mass Lay Off Statistics.

7 In the quantitative research of WORKS, it turned out to be impossible, for instance, to identify HRM as a business function in employment data due to the fact that it is not possible to assign administrative occupations specifically to HRM tasks (Geurts, Coppin & Ramioul, 2007).

used in establishment surveys, starts from the sectoral level and dissects this further into a preliminary defined set of presupposed 'generic' business functions. These are then used as observation units to map offshoring and outsourcing.[8] Such a top-down method also formed the basis for the design of the WORKS qualitative research. Here, five business functions that were considered as generic: production, IT, R&D, customer services and logistics, were distributed across sectors (and countries) to provide the sampling matrix for the case study investigation. For example, the restructuring of the logistics function in a food company in Bulgaria was one case while the restructuring of software production in the IT sector in France was another. In the third chapter we will describe this approach in detail.

The prior definition of a set of generic business functions appeared to work in surveys which aim to map relocation and outsourcing at a more detailed activity level than the company as a whole. The concept itself and its operationalisation into a classification of activities basically need to give the respondent a sufficient understanding to grasp the objectives of the survey and answer its questions validly, as was done in the surveys mentioned. Defining business functions in a generic way was also helpful in constructing a case study sample matrix involving a variety of sectors (from Food to IT), as was done in WORKS. Here, the range of selected generic business functions was intended to identify which units of the company needed to be included in the empirical observation.

The key question, however, is whether the conceptualisation of the value chain as composed of a set of generic business functions is adequate for observing restructuring from the perspective of the technical division of labour or for making assumptions about the job content and changes in it that occur in relation to this restructuring, which are central themes in our study. For several reasons we question the adequacy of the concept for these purposes. Firstly, the 'business function' as such does not offer clarity on the technical division of labour. The description of global value chains as composed of a range of generically defined activities and their visualisation as a series of boxes linked with arrows, does not make it possible to specify the work organisation, the job content or the tasks making up those activities. These dimensions cannot be derived from the generic label. For example, the business function 'logistics' as a technologically and economically distinct activity does not provide any indication of what types of jobs this function may include, what tasks make up those jobs and how they relate to each other and to other business functions such as production or sales. Equally, it would be highly speculative to make preliminary statements or formulate hypotheses about the skills required to perform 'logistics', the physical and psychological working environment in logistics jobs, the discretion and learning opportunities available to logistics employees, etc. It is clear even *prima facie* that there is in reality a range of organisational diversity in ways of organising the logistics function, even within one sector.

A related problem when the business function is taken as the unit of observation is the underlying assumption that global value chain restructuring involves the complete externalisation of entire business functions. It is questionable whether this is indeed the case. It is conceivable that corporate restructuring projects may also involve hiving off only some of the tasks of a business function and that, consequently, the technical division of labour *within* the business function changes through the restructuring process. In other words, one should always consider the possibility that the dividing line between the tasks that are spatially transferred and those that are not does not necessarily coincide with the boundaries of a delineated business function but may also differentiate between its component tasks. It is also imaginable and indeed a major research question in this study, that the externalisation of business functions simultaneously provokes or is preceded by changes in the technical divi-

8 This was the approach used *e.g.* by Sturgeon (Sturgeon, Van Biesebroeck & Gereffi, 2008), the International Sourcing Survey (Statistics Denmark *et al.*, 2008), the Belgian KEROSINE Survey (De Kocker & Wynants, 2009; Geurts, 2009).

sion of labour within the restructured business function. In these cases, a generic definition and observation at the business function level are not sufficient nor adequate. This may therefore raise the question of what is the added value of the business function as a unit of observation and analysis. Indeed it seems to be essential to look inside the black box of a business function and analyse task composition at a lower level if we are seeking to identify changes in the technical division of labour in relation to spatial restructuring.

These reservations are linked to our second consideration: business functions such as production, sales and customer services, logistics and transport, finance and accountancy, as observable within an organisation, are *a priori* not only analytical categories but are shaped by managerial decision-making and organisational choices. Porter's book was meant as a corporate tool for cutting costs and improving profits based on the analysis of the economic added value of the various business functions of the firm. The purpose of making the economic added value visible for each business function, not only for the primary functions but also for secondary support functions, is to refocus the firm's strategies on those business functions that add most economic value and consequently to reconsider the governance modes for the underperforming ones. Business function analysis thus generates or facilitates outsourcing decisions and substantiates corporate locational strategies. In other words, the whole idea behind it is to advance the social division of labour. Consequently, business functions are socially shaped and reflect organisational choice. One objective from our theoretical perspective is to bring to the surface the managerial rationale behind spatial restructuring. Given this objective, business functions must be regarded as the outcome of managerial decisions rather than as abstract analytical concepts. In other words, since we wish to expose managerial decision-making in the analysis of spatial restructuring processes, it must be acknowledged that the set of business functions of an organisation and the way in which these are structured are outcomes of such decision-making processes in the first place.

The importance of addressing managerial choice when observing changes in the division of labour raises a third and final critical question: how does the level of the organisation fit into the analysis when it comes to understanding the logic, processes and impacts of spatial restructuring? Managerial choices are related to corporate strategies and rooted in the organisation. The theoretical approach and the empirical analysis of global value chains suggest shifting the focus of the analysis to the level of interfirm relationships and eventually to the entire value chain. Based on the argument that a single organisation accounts for only parts of production and contributes only part of the economic value of the products or services delivered to the market, the analysis is oriented towards the various 'nodes' in the value chain that generate economic added value, their territoriality and the economic governance modes by which they are linked to each other. Using the business function concept, the focus is shifted down to the various activities within production processes that are not necessarily organised at one physical location or within the confines of a single contractual relationship. Hence, the unit of analysis in the research is not the organisation but the entire value chain on the one hand and a specific business function on the other (Ramioul, 2008: 24).

While this double shift is important in order to take account of recent corporate trends in research on changes in work, it also means shifting attention away from the organisation as the level where restructuring is essentially initiated and shaped and where the major impacts of restructuring on work are to be found. The question here is how to take account of the fact that business functions are subject to the rationales and strategies deployed at the level of the organisation. These rationales and strategies are conceived to serve the organisation's goals. In addition, and no less importantly, the organisation, not a specific business function or value chain, is the arena for the complex conjunction of confrontation and collaboration between management and workers. The importance of including managerial choices as

related to the organisation's goals and the central perspective of including the employment relationship in the analysis of restructuring processes, place the organisation in focus. In order to understand the complexity of drivers and motives behind a restructuring process, how it unfolds in practice, the broader context of the restructuring, how it is influenced by the employment relationship and what its outcomes are, it is the organisation rather than the value chain or the business functions which is of relevance.

In conclusion, while there is some benefit from introducing the global value chain and the business function as 'research tools' into research on changes in work, their conceptual and empirical added value for our research endeavour remains an open question when we critically consider their underlying assumptions. At what level is spatial restructuring implemented? At the level of an entire business function or at the level of its component tasks? How do managerial strategies play a role in the shaping and restructuring of business functions, leading to changes in their configuration and structures? And when analysing the restructuring of global value chains, how can the organisation be included, as the arena where these strategies are deployed in interaction with workers?

Based on these reflections, we have three main tasks in this chapter. Firstly, rather than roughly conceptualising the business function as a 'node in a chain' we need a more fine-grained analytical scheme to enable us to empirically observe changes in the technical division of labour, down to the component tasks of the production process being restructured. The organisational structures approach described by Achterbergh and Vriens, (2009) and based on Modern Sociotechnical Systems Theory (de Sitter, 1981) lends itself to such an analytical framework and equips us with a suitable vocabulary for observation. This is the subject of the next section. Secondly, we need to make explicit the way we address the organisation as the locus of managerial decision-making when investigating spatial restructuring. Thirdly, we need to address managerial strategies in interaction with the workers and the organisation as the arena of that interaction, when investigating spatial restructuring. This last issue will be clarified with the help of the labour process approach which puts the employment relationship at the centre of its analysis.

1.3.3 The organisational structures approach and the Modern Sociotechnical Systems Theory

1.3.3.1 Design principles for production and regulation

The organisational structures approach directly draws on the Modern Sociotechnical Systems Theory (MSST) for which de Sitter laid the foundations (de Sitter, 1981; van Eijnatten & van der Zwaan, 1998) and which has been adopted by both organisation theorists and practitioners, specifically in the Netherlands.[9] Authors on the Modern Sociotechnical Systems Theory, building on de Sitter's work, have basically developed a theory to understand the structures of transformation processes. This has been further developed in a theory of organisations (see *e.g.* Christis & Korver, 1992; Van Hootegem, 2000; Achterbergh & Vriens, 2009) and is increasingly applied in research into organisational structures and change. As such, it has found its way into the practical (re)design of organisations under the label of Integral Organisational Renewal (van Eijnatten & van der Zwaan, 1998: 293) in the Netherlands and more recently it is being disseminated in both the Netherlands and Flanders under the label of social innovation or workplace innovation (Pot, 2012). From the international perspective,

9 As van Eijnatten and van der Zwaan (1998) explain, there are some links with the broader Socio-Technical Systems Design paradigm and its international variants. Within this broader approach, the 'Dutch' version of Modern Sociotechnical Systems Theory focuses more on structural dimensions of the design of organisations.

the approach is directly linked to the debate and academic strands on new forms of work organisation and high involvement workplaces, as inspired and stimulated by the work of Kern and Schumann (1984) and the wide range of scholars drawing on their insights. We examine this approach as a potentially useful analytical scheme to formalise our empirical observations.

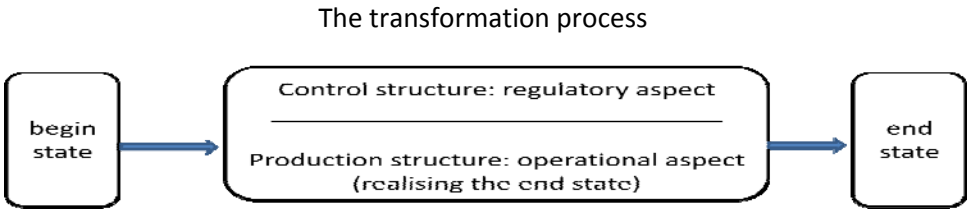
A key element in de Sitter's approach and vital to the adherents of MSST is the link between the organisational objective, which is defined as surviving in a turbulent environment and producing in an efficient and effective way, and the objective of improving the quality of work. According to these scholars, more flexibility and effectiveness and a better quality of work can be jointly realised through integral design of the organisational structure (van Eijnatten & van der Zwaan, 1998: 297). The point of departure is the organisation's key goal of organising transformation processes under the conditions of meaningful organisational survival and taking account of disturbances (Van Hootegem, 2000; Achterbergh & Vriens, 2009: 224). This key goal is achieved through (1) the organisation's primary transformation process and (2) its regulation structure that has the capacity to attenuate external and internal disturbances that may impinge on the primary transformation process and to amplify the regulatory potential of the organisation to deal with such disturbances (Achterbergh & Vriens, 2009: 12ff).

It is vital at this point to emphasise that both de Sitter and the organisation theorists building on his work apply this conceptualisation of transformation processes within the confines of the organisation, which is a specific type of social system. The transformation process as conceptualised in the MSST, which includes both primary transformation and regulation, is not exclusively restricted to organisations but can be applied to various other social systems, such as families, social movements and so on. It is not the prevalence of a transformation process as such that defines the organisation but the allocation of the different tasks in this process to workers who are brought together by means of an employment contract. In other words, the analytical model used to conceptualise the transformation process is of a generic nature. Nevertheless, the present study is not about families or social movements but about organisations. We will therefore continue to refer to the generic concepts as they are applied in organisations, which means that we will use the corresponding terms as proposed by the referenced authors. When we refer in this study to the work of Achterbergh and Vriens, the organisational structures approach, and the Modern Sociotechnical Systems Theory which is an essential component of this organisation theory, we will use the reference 'STOSA' (SocioTechnical Organisational Structures Approach) for the sake of brevity.

Three conditions are necessary in order to realise the primary transformation and regulatory processes in organisations. The first is an adequate organisational structure and division of labour, which refers to defining tasks and responsibilities. The second is adequate human resources, defined by the authors as recruiting and developing skilful, knowledgeable and motivated workers. Thirdly, the right technical infrastructural conditions are required for the realisation and operational regulation of transformation processes (Achterbergh & Vriens, 2009: 13). The first condition, the organisational structure, anticipates the human resources and technological infrastructural conditions and is the primary focus of our interest here. This is an important point: both the organisational structures approach and the MSST start from the organisation process in the various transformational and regulatory tasks that have to be carried out to realise the end state of a product or a service. These different steps still have to be allocated to employees, which can be done in a variety of ways. The employees are thus, in principle, left out of the observation and analysis (van Eijnatten & van der Zwaan, 1998: 293 294).

As defined by de Sitter: 'An organisational structure is the grouping and coupling of transformations into tasks and the resulting relations between these tasks relative to orders' (Achterbergh & Vriens, 2009: 236). The organisational structure is the combination of the production and control structure (*ibid.*: 237) (see Figure 1.2). The production structure contains the network of tasks covering the operational aspect of the transformation while the control structure contains the network of regulatory tasks required to deal with disturbances in the production structure (*ibid.*: 232).

Figure 1.2 **The organisational structure: operational and regulatory aspect of a transformation process**



Source Based on Achterbergh & Vriens, 2009: 231

The point is that the way in which the transformation process is designed is decisive in determining its potential to achieve the organisation's objectives under the condition of meaningful organisational survival. To properly understand this model and why it is of relevance here, three different underlying principles are clarified. First, it is a basic fact that for each task a generic set of subtasks can be identified, defined as generic system functions. These generic system functions are preparation (planning, purchase of raw materials, provision of tools and other means required to realise the transformation, etc.), making (the primary transformation process) and support (maintenance, quality control, etc.). The regulatory or control system function is the fourth generic system function. It can be identified at the level of each of the three operational system functions. Preparation, making and support each include a regulatory dimension that is conditional to carrying out the task and necessary to deal with possible disturbances. The generic character of this model means, as has been stated, that it can be applied to all kinds of transformational processes and not only to those carried out by organisations. As we will explain below, another essential feature is that the generic system functions can be identified at different levels in the organisational structure: the level of the overall transformation process of a good (or service), the level of each step in the transformation process, and eventually also at the level of the individual tasks.

The second underlying principle is that the production structure is regarded as the outcome of the gradually more fine-grained decisions on the division of labour for the generic system functions (planning, making, support and regulation) at the various levels: 'through a sequence of decisions with regard to the coupling and decoupling of activities, the aggregate of transactions in an organisation is gradually transformed from an undifferentiated pool of tasks to a network of orders or jobs' (Van Hootegem, 2000: 67, own translation). This means that the preparatory, making, supportive and regulatory system functions can be coupled or decoupled in a wide range of possible combinations, which results in a number of organisational varieties in the overall organisational structure, the various steps and the tasks that eventually have to be allocated to employees.

Third principle: these varieties in the division of labour for system functions are based on grouping principles. The basic grouping principle boils down to a choice between either a

coupling of similar functions for a range of different orders or the coupling of all the different functions for groups of similar orders.[10] In fact, this grouping principle is close to the organisational design parameter 'unit grouping', used by Mintzberg in his work 'Structure in 5's' to distinguish the bases for grouping (by skills, products, services, clients, work processes, business functions, etc.). Mintzberg distinguishes between consolidation either by function or by market: '(...) by *function*, that is by the means the organization uses to produce its products and services, and by *market*, that is by ends, by the characteristics of the ultimate markets the organization serves' (Mintzberg, 1980: 325, italics in the original). Based on this fundamental choice between linking either similar tasks or similar orders, different organisational design principles are distinguished according to the level at which they are defined and whether they concern operational aspects or the regulatory aspect.

1.3.3.2 Grouping principles, business functions and tasks

We will now illustrate this model to make it more concrete. Firstly we view the system functions at the level of the overall production structure and how these are coupled. In the STOSA, this is called the level of functional concentration or deconcentration. Functional concentration means that all tasks of the same type are concentrated within specialised functional departments where they are carried out for all order types (customers, products or projects) or for all the other departments. Functional deconcentration, in contrast, means that each different (groups of similar) order type has its own specific set of operational subtransformations (Achterbergh & Vriens, 2009: 243). Functional deconcentration, the coupling of all tasks for similar order types, generates parallel flows in the process rather than specialised functional units in the organisation. One example is the HRM function, which can be defined as all operations aimed at regulating personnel in an organisation: selection and recruitment, compensation, development and training, industrial relations and employee involvement practices, etc. From the perspective of the overall production structure, HRM is a supportive function. In some organisations these HRM tasks are concentrated in a special unit serving all departments of the organisation. In many organisations, however, HRM related activities are instead organised at a lower level in the organisation and are carried out by a variety of staff, such as hierarchical superiors or frontline managers, for whom these tasks are part of their basic job description and day-to-day work. In this case they are deconcentrated (Ramioul, 2008). Similar examples can be found for all other types of supportive or preparatory functions in the overall production structure, such as production planning, IT support, sales, quality control, etc. These functions can either be organised/concentrated in specialised functional departments or deconcentrated at lower levels in the organisation, where they are linked to all other tasks necessary to process similar order types.

The principle of functional concentration *versus* deconcentration makes it possible to understand the origin of business functions. The input-output structure and the aggregate of primary and supportive business functions in an organisation, as analysed in studies on global value chains, can be perceived as the outcome of the decisions on the coupling or decoupling of the generic system functions of a production structure. The way in which the functions of a production structure - making, preparing and supporting - are coupled and decoupled will result in a specific configuration of distinct physical business functions that may be conceived and classified as generic but are in fact the result of organisational design. Functional concentration may lead to the establishment of separate functional units that can be more easily hived off to other organisations or relocated to other places. The complex spatial and contractual division of labour in our advanced economies is indeed the outcome

10 Similar orders may refer to similar customers, similar products/services or similar projects (Christis, 2009: 13).

of historical processes of increasing functional concentration and specialisation based on managerial strategies for which *e.g.* Smith and Taylor laid the foundations. As a result, what should be called primary or secondary business functions are relative and constitute an empirical question. Porter's secondary or supportive business functions (finance and accountancy, HRM, training, product development) can be identified as preparatory or supportive to the primary production function in one specific organisational setting but as primary in another organisational setting.

The implication of this model is that business functions, as defined and applied by those studying global value chains, can be analysed not only from the perspective of their economic added value, but also from the functional perspective: the production structure resulting from a specific coupling or decoupling of generic system functions. Linking up to the division of labour concepts, business functions reflect the outcome of the processes involved in the technical division of labour, which includes both horizontal and vertical division of labour. The fact that there is a dedicated IT department, legal department or sales department is the result of decisions about this internal technical division of labour. In addition, looking at the division of labour from a business function perspective makes it possible to identify specialised firms (and sectors) as the outcome of the historical increase in the social division of labour between organisations based on corporate outsourcing strategies. In short, there is considerable variety in the way business functions are shaped and structured depending on the choices made on coupling or decoupling generic system functions in a transformation process.

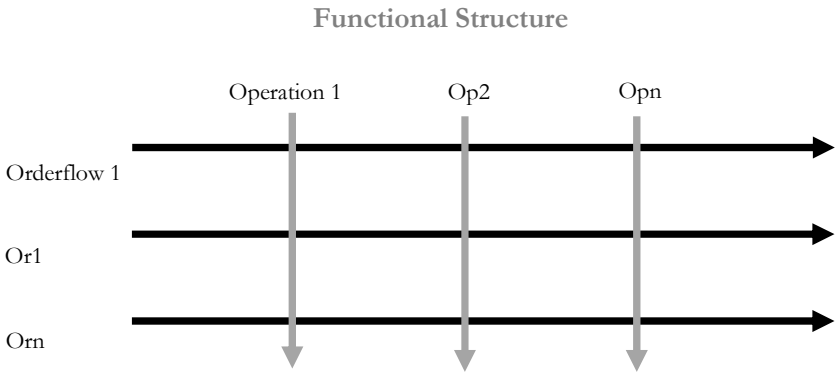
Without making reference to the STOSA, Gospel and Sako's study on the evolution of shared services and outsourcing in human resource management (Gospel & Sako, 2010) provides an interesting illustration of this. They observe that outsourcing of the administrative functions of firms, in this case HRM, may occur before, after or simultaneously with the transformation of this business process (*ibid.*: 20). The way in which outsourcing is implemented is, however, highly dependent on the degree of centralisation previously reached in the organisation. Based on two cases involving large transnational companies, the authors demonstrate that while companies with disparate administrative processes based on a strongly divisionalised structure can expect to achieve more through the creation of internal central structures such as shared service centres, this is much more complicated for them. In contrast, companies with a relatively established centralised structure (or, in our terms, functionally concentrated business functions) will be better able to implement shared service centres and to outsource these and will consequently have greater opportunities to save on transaction and coordination costs (*ibid.*: 26). In the range of studies on offshoring and outsourcing, 'modularisation' is also identified as a key strategy to enable the spatial distribution of work (Maenen, 2010: 66; Huws, 2011: 518).

At the second level of analysis, the three operational transformational system functions of making (producing), preparing and supporting, grouped into business functions, are each similarly organised according to the basic design principle (Achterbergh & Vriens, 2009: 245). It should be noted that at this point decisions are also made on which operations will be taken over by technology, *i.e.* by automation and computerisation. Technologies may be used for each of the four generic system functions. The remaining steps in the organisational design concern those operations which are not automated. For each of these, the generic system functions can again be identified. The STOSA refers to the grouping of operations and responsibilities at this level as the 'level of differentiation'. The level of differentiation refers to the extent to which 'prepare, make and support' operations for one business function are coupled or integrated. One illustration is photocopier sales, which is in itself a business function of the 'copy machine production structure'. The business function 'sales' again

includes preparatory operations: informing the customer (discussing the need for a specific photocopier, demonstrating different models, etc.) and clarifying the sales contract (specifying maintenance and support arrangements, payment schedules, delivery arrangements). Then there is the primary 'making' operation of selling the machine (drafting the contract, delivering the machine to the customer's premises and receiving the money), and finally there are supporting operations (after-sales services, maintenance, technical support, etc.). These operations can all be linked together and subsequently assigned to (groups of) employee(s) who are responsible for one (or a number of) customers, or they can be differentiated into different jobs and allocated to a sales representative, a member of legal staff, a truck driver and a maintenance technician.

Similarly, the business function 'production' can be organised, in broad terms, either by linking together all the technical operations involved in producing one product or by decoupling these technical operations and bundling them for all products on the basis of their technical similarity. This results in what is commonly referred to as a product-oriented or order-based *versus* a process-oriented or operation-based production flow. Operation-based production flows form the basis for production structures designed according to Taylorist division of labour principles. The illustration below shows the basic ways of differentiating operations at this level.

Figure 1.3 **Coupling all different operations for each (group of) ordes or coupling all similar operations for all order**



At a lower level than the business function, the design criterion 'differentiation' also permits a more in-depth analysis of how transformation processes are structured and restructured. This addresses the issue, which was raised earlier, that restructuring may involve changes in the task composition of the business function. Such a partial restructuring of a business function may, for instance, be based on the limited options to geographically transfer certain tasks.

Thirdly and finally, design decisions are made with respect to the division of labour at the level of a specific operation. This refers to the levels of specialisation and fragmentation. The level of specialisation refers to the number of subdivisions of an operation into small subtasks, meaning whether or not a single task involves 'making' or also includes preparation (*e.g.* planning), support and regulation (*e.g.* control). Tasks may therefore be simple or complex. Fragmentation refers to the breadth or 'number' of tasks (which each may have different compositions) (Van Hootegem, 2000: 75; Achterbergh & Vriens, 2009: 245). A classical production line based on simple (as contrasted with complex) and highly fragmented, short-cycled operations in mass production manufacturing provides a suitable

illustration. A notorious example of mass production is found in the clothing sector, where mass production takes place in low wage countries except for the 'final touches' to the garment: sewing in the brand label. For this final, simple task, the nearly-finished product is brought back to the country where the garment will eventually be distributed. The level of differentiation and the level of task specialisation and fragmentation lead us to the core of the wide range of studies on Tayloristic production processes where changes in the division of labour based on simple and fragmented work are of major interest. The principles of differentiation and specialisation-fragmentation provide insights into the work organisation, tasks and job content within a business function and thus permit analysis of possible changes in these in relation to its restructuring.

Similar separation and grouping principles are formulated for the regulation or control structure of the transformation process, where the first design principle is the degree to which the overall regulation structure is separated from or integrated with the operational structure (Achterbergh & Vriens, 2009: 246; van Amelsvoort, 2010: 254). The regulation structure essentially aims to ensure that 'the organisation maintains a separate existence in its environment' (Achterbergh & Vriens, 2009: 192; van Amelsvoort, 2010: 254). Regulation refers to both external regulation (processing of orders to products and services, taking account of customers' wishes and of changes in the external environment, etc.) and the internal coordination of units, groups, people and equipment (van Amelsvoort, 2010: 154ff). The more complex the product and process, the greater the demands placed upon the internal regulation structure. In a similar way to the operational structure, internal regulation may also be organised at different levels in the organisation: the level may be (the group of) employees carrying out similar tasks, the operational system function or the entire organisation (*ibid.*: 259ff). Regulation may therefore itself also be subdivided into operational, tactical or strategic regulation which can be assigned to different hierarchical levels. Finally, all the different activities and levels have to be linked together. This refers to the (functional) coordination of divided technical processes which we discussed in the previous section. Typically horizontal and vertical coordination mechanisms are distinguished (*ibid.*: 261). In all, these regulation activities can be separated from the making as well as from supportive and preparatory activities in the organisation and organised separately for each of these.

1.3.3.3 Summary

The approach that has been put forward offers an analytical framework to observe and understand the technical division of labour in transformation processes and changes in these. By combining the subsequent choices which are made on coupling or decoupling at different organisational levels of generic system functions of a transformation process, it becomes possible to explain organisational differences in the production of similar products or services. The combined result of decisions on design principles constitutes the organisational structure. Due to the differences in the design of organisational structures, tasks in similar transformation processes can range from extremely fragmented, simple tasks to wide-ranging, integrated and complex jobs (Van Hootegem, 2000: 67ff). The final outcome of the different steps in the technical division of labour is thus a structured network of interconnected jobs which will eventually have to be assigned to workers through organisation-specific allocation principles.[11]

11 In fact, the tasks in a technically divided process can either be assigned to employees or 'assigned' to technological systems, in other words automated. Consequently full correspondence does not necessarily exist between the production structure and the tasks assigned to employees. For reasons of brevity we omit this distinction here and focus only on the allocation of tasks to employees.

An important step towards building our research framework is therefore complete: the analytical formalisation of transformation processes into generic system functions and their interrelationships generates a model that is robust in the sense that it has strong potential for making comparisons. Variations in organisational structures resulting from different design principles and different combinations of generic system functions at different levels, can be described and compared using the same vocabulary and applying the same set of concepts and relations. The above model also makes it possible to compare the production structures, business functions and tasks within these business functions before and after their geographical restructuring. In this way, the formalisation achieved using a (relatively) simple conceptual model makes it possible to reduce the complex social reality for the purpose of observation and interpretation, and thus to 'create order where there is chaos', which is a core mission of social science (Van Hootegem, 2000: 17).

For the present study, the original key question 'What is the relationship between changes in the spatial division of labour and changes in the technical division of labour?' can be specified further: 'To what extent will spatial restructuring provoke changes in the level of functional concentration, differentiation and task specialisation and fragmentation?'. Given, however, the fact that the technical and social division of labour are not entirely mutually independent as has been explained, the relationship may also operate in the other direction, leading to the question: 'To what extent might changes in the level of functional concentration, differentiation and specialisation-fragmentation alter the conditions for a spatial division of labour?'.

1.3.4 Reducing complexity

One key advantage of this model is that it makes it possible to include managerial decision-making and corporate strategies in the picture, since organisational design is regarded as the outcome of choices and decisions. Various theoretical perspectives can be called upon to explain such choices and decisions. The organisational structures approach develops this analytical framework from the perspective of what they call the organisation's key goal of 'meaningful organisational survival in a turbulent environment full of (potential) disturbances' (Achterbergh & Vriens, 2009: 224). The STOSA aims to make organisations innovative by creating synergies between effectiveness, flexibility and the quality of work. The key to organisational design that makes it possible to reconcile these three organisational objectives is integration rather than separation. Increasingly diverse products and services, heterogeneous clients and markets, and (sometimes unpredictable) fluctuations in orders and workloads lead to increased complexity in transformation processes. This forces the organisation to break down the production structure into different and separate work flows. Following the principles already set out, it should be preferable to do this according to order types and to integrate all different tasks (preparation, making, support and regulation) for one order (or a set of similar order types). The reason for this is that the tasks involved in producing a single order are highly interdependent. If these different functions and tasks are separated and spread across different work flows, this increases organisational complexity and interdependency between, rather than within, work flows.

A core argument for reducing complexity is that in an organisational structure where the tasks for producing one product are coupled (including regulation), disturbances that occur during the transformation process will be attenuated because the number of relationships and interfaces in the network of tasks and the variability in those relationships is reduced

(*ibid.*: 261ff).[12] At the same time, the integration of tasks will strengthen the regulatory potential to solve these disturbances. Especially in turbulent environments, such integration is important, both at the level of operations and at the level of regulation. If, on the contrary, the different tasks involved in realising a single product are assigned to separate flows, every product takes time to be passed on to the next flow which may generate disturbances. In addition the solution of these disturbances becomes more complex. Consequently, when seeking to reduce disturbances, researchers in this area postulate the importance of 'low values' in production structure parameters, which means low levels of functional concentration, differentiation and task fragmentation and specialisation. Such low levels of concentration are also a necessary precondition for reducing regulatory tasks to the lowest level, which in turn is required in order to increase the potential for regulation (Christis, 2009: 13). In short, the core mission of STOSA is to change complex organisations with simple functions into simple organisations with complex functions (*ibid.*: 9).

Based on these important consequences of the design of transformation processes, the research question on changes in the technical division of labour related to spatial restructuring may be complemented by adding a further dimension: 'What will be the effect of these changes on disturbances and on the regulation potential?' An advanced geographical division of labour may result in complex (inter-)organisational structures and increase the number of relationships and interfaces within the network of tasks. The distance between tasks is likely both to amplify disturbances between highly interdependent, and geographically and/or contractually dispersed, tasks and to decrease the potential to resolve these adequately.

1.3.5 The link to the quality of work and to knowledge

The relationship between the technical division of labour and the quality of work is relevant to our study because it allows us to create a link to our second research objective, which concerns the role of knowledge in spatial restructuring. A close relationship exists between the structure of the technical division of labour, job content and workers' opportunities to make use of their knowledge and skills in their work and learn from it. To the extent that spatial restructuring changes the job content, these conditions for knowledge and skill utilisation and learning will also change.

It has already been pointed out that the approach used by STOSA researchers explicitly addresses the goal of improving the quality of work. The link between the operational and control structure and the quality of work is easy to make. Tasks in which employees are confronted with many disturbances place high job demands on them, which may be problematic if they lack the resources to resolve them, including the regulation potential and decision-making latitude. In other words, the quality of work is likely to worsen with high levels of concentration, high levels of differentiation and high levels of task specialisation and fragmentation because adequate levels of regulation potential will be lacking at the place where problems occur (which is likely to happen more often) (Achterbergh & Vriens, 2009: 257ff). Based on this premise, authors on the STOSA conclude that, in addition to more efficiency and flexibility, job quality is also fostered by low disturbances and high regulation potential (van Eijnatten & van der Zwaan, 1998: 303ff). This view of what constitutes good job quality, so-called integrated tasks, is in line with the generally adopted position in the literature on the close relationship between the technical division of labour and the quality of work. The key reference literature, to which the above researchers also refer, builds on the

12 Christis (2009: 13) emphasises, however, that in the lean production model based on similar organisational principles and on just-in-time, the constant effort to achieve further reduction of in-process stock will increase the vulnerability of the production structure to disturbances.

job demands/job control model developed by Karasek and Theorell (Karasek, 1979; Karasek & Theorell, 1990) and the broad strand of research that tested, fine-tuned and enlarged their model. Summarising in broad terms, the model argues that jobs need to provide workers with adequate resources to meet the job demands. Job demands refer to 'the physical, social and organisational aspects of work that require psychological and/or physical attention and effort' (Holman & McClelland, 2011: 17). Job demands include workload, cognitive demands, emotional demands and physical demands. Required skills and knowledge are thus explicit aspects of job demands.

Job resources enable the person to manage these job demands, facilitate the achievement of goals, promote learning and fulfil basic human needs (*ibid.*). Originally job resources mainly referred to decision latitude but the concept has gradually been enlarged to include other work aspects, including feedback, social support, skills utilisation and task significance (Demerouti *et al.*, 2001). In addition it is now seen as common sense in the quality of work literature also to take into account other dimensions, which can be broadly grouped under 'quality of employment' (wages, working times, benefits, etc.) and 'quality of empowerment' (individual and collective voice and representation, access to training, etc.). Essentially, these additional dimensions include the core aspects involved in the allocation of workers to the tasks which are shaped in the technical division of labour, as well as their participation in the organisation. Together with the job content, these dimensions make the quality of work a multidimensional concept (Bustillo *et al.*, 2009; Holman & McClelland, 2011). This broader set of dimensions is missing from the STOSA due to the confines of their theoretical model, which places the emphasis on providing a coherent model on the organisational structure and its relation to job content.

We are specifically interested in the relationship between job content and the conditions for learning. These conditions depend on the balance between knowledge and skills requirements and the knowledge and skills of workers. By definition, job content determines the knowledge and skills required to do the job. The concept of job demands includes several dimensions that directly point towards required knowledge and skills, such as the aspects of work that require psychological attention and effort and cognitive demands (if tasks are complicated). Workers have the opportunity to use their skills and mobilise their knowledge to meet these requirements when jobs enable workers to organise their work and allow them sufficient opportunity to solve the problems that confront them, receive feedback and seek support. Achterbergh and Vriens state in this respect that jobs fostering skills imply that they are 'sufficiently complex to allow for gaining knowledge about cause-effect relations related to the goals of a job' (Achterbergh & Vriens, 2009: 361). Jobs including preparatory, supportive and regulatory tasks provide basic conditions for the use of such skills and knowledge. If skill and knowledge requirements are in balance with the worker's skills and knowledge, the conditions for learning are optimal (Thompson & Smith, 2010: 17; Holman & McClelland, 2011). Simple and fragmented jobs, in contrast, do not provide opportunities to apply and develop job-related skills (Achterbergh & Vriens, 2009: 361). These knowledge-related aspects of job content will be dealt with in more detail in the second chapter.

In conclusion, the analytical framework used to formalise the empirical observation of spatial restructuring enables us to formulate more detailed research questions concerning the relationship between spatial restructuring and the technical division of labour. Firstly: 'Will spatial restructuring be related to changes in the level of functional concentration, differentiation and fragmentation?'. Secondly: 'What are the effects of these changes on disturbances and on regulation potential?'. Thirdly: 'To what extent will these changes impact on job quality?'.

Earlier we identified three main tasks for this chapter: first: to build an analytical framework to formalise the empirical observation of the technical division of labour; second: to make explicit the way the organisation is included in the study; and third: to clarify the theoretical perspective that will provide an interpretation scheme to understand the process and impact of spatial restructuring. Now that the first task has been accomplished we can address the two remaining tasks, starting with the organisation.

1.4 The organisation and the employment relationship

1.4.1 Defining organisations

1.4.1.1 The organisation and the global value chain

In the previous section we demonstrated that the STOSA provides a powerful analytical scheme for analysis of transformation processes as they are found in organisations. Since our study does not investigate the restructuring of entire companies or entire global value chains but focuses on relocation, as a change in the chosen allocation of part of a transformation process, it is the organisational perspective rather than the value chain perspective which is essential. Indeed, when looking at production processes in reality, what we 'see' is not value chains but organisations, as identifiable entities, amongst which transformation processes are distributed. The value chain is relevant in that it provides a broader perspective on the division of labour that transcends the individual organisation but earlier we were concerned about losing the focus on the organisation by overly emphasising this broader value chain perspective. The option to take a specific activity of an organisation as the unit of research rather than the entire organisation, does not exempt us from defining what constitutes 'the organisation' where the activity under review is (re)shaped as a result of decision-making processes.

Observing and delineating organisations no longer seems to be straightforward. As has been explained, in the context of a growing and complex inter-organisational and spatial division of labour, transformation processes stretch in different directions beyond the organisation's physical premises, combining different economic coordination mechanisms and different locations. In advanced economies, organisations cannot be conceived as self-contained. The various steps involved in a transformation process to bring a product (or service) to the market will rarely all be carried out by a single organisation. By the same token, it is likely that a single organisation will accommodate (parts of) multiple transformation processes. From the perspective of the global value chain, the organisation can be conceived as a cross-section or subset of one or more different value chains which are the outcome of historical technical and social division of labour processes. From the perspective of the organisation, however, the view is different: the organisation is the outcome of managerial decisions on activities that must be performed to realise specific organisational objectives and how these activities are organised by combining different governance modes - market, organisation and possible intermediate collaboration modes - as well as different geographical (and temporal) options.

1.4.1.2 The organisation as social system

It has already been mentioned that according to the organisational structures approach, the organisation's key goal is 'organising transformation processes under the condition of meaningful organisational survival and taking account of disturbances' (Achterbergh &

Vriens, 2009: 224). The organisation of transformation processes is achieved through the primary organisational structure within the organisation itself, which consists of an operational transformation process, the production structure, and its regulation process, the control structure. As we have already mentioned, an adequate organisational structure is identified as the first condition that anticipates the conditions in terms of human resources and technological infrastructure (*ibid.*: 13). Once the organisational goal is defined, the management decides on the primary activities needed to realise this goal (*ibid.*: 192). For the primary activities, subsequent decisions on functional concentration or deconcentration at different levels will then result in specific production and regulation structures. In the decision-making process of allocation, the primary activities will generally be organised in-house because they are most important to the organisation's survival, while other necessary activities will be acquired from other organisations through trade relationships. In addition, decisions will be made on where these activities will be located, especially where the organisation has multiple sites at its disposal. The end result is an organisation with a specific internal structure and with, in principle, a more or less complex set of links to the broader value chain(s) which will eventually bring the product or service to the final customer.

Since organisations operate in turbulent environments, their internal structure and these links to other organisations will be reviewed if this is expected to be more appropriate and effective to achieve the goal of meaningful organisational survival. In that case, the management may decide to change the internal production structure, the technical division of labour, the contractual coordination modes (outsource or insource activities) or the location of in-house activities, or to combine all these in single or successive restructuring processes. In sum, from the perspective of the organisation, decision-making on the technical division of labour and the social division of labour both within and beyond the organisation and changes made to these are made with the organisation's key goal in mind.

It should be clear, however, that the contractual and spatial (and temporal) allocation of the tasks within the organisational structure does not in itself provide the organisation with the workers needed to carry out the work. In order to have access to a workforce, the organisation must bring together a number of people in a relationship that allows it to ensure, in a sufficiently stable way, that all the jobs will be carried out in the way that the organisation expects them to be carried out (Van Hootegem, 2000: 79). Such a relationship is established when individuals are connected with the organisation by means of an employment contract. By selecting workers and establishing an employment relationship with them based on an employment contract, the organisation establishes itself as a social system and defines its boundaries with the external environment and with other organisations.

It thus appears that organisations can be described as social systems with goals, decisions and boundaries. To use the version of the definition that Daft, Murphey and Willmott (2010: 10) propose in their book 'Organisation theory and design', organisations are: '(1) social entities that (2) are goal-directed, (3) are designed as deliberately coordinated activity systems, and (4) are linked with the external environment'. As the key goal of organisations has been described earlier, organisational decision-making further concerns defining the primary transformation process and designing the organisational structure to realise this process as 'a coordinated activity system'. These decisions were also clarified in the previous section. Concerning the organisation as a social system, Van Hootegem (2000: 76ff) refers to Luhman's social system theory. In this theoretical perspective, a system consists of a network of related nodes. The decisions on the technical division of labour for a given transformation process structure the relationships between the network of jobs, which can be regarded as the nodes in this system. As we have seen, however, this structured network of jobs still has to be allocated to people using a range of allocation mechanisms. The structure of the technical divi-

sion of labour is consequently only part of the organisation as a social system; it is a subsystem (*ibid.*: 39). The combined allocation mechanisms also have to establish a network of structured relations in order to enable to link workers to the network of jobs.

It has already been pointed out that the social division of labour comprising decisions on inter-organisational, spatial and temporal allocation is not sufficient to ensure in a stable way that all jobs will be carried out according to the organisation's expectations. To be certain of this, the organisation needs to establish a stable relationship with its workers. This relationship is established in the employment relationship. The employment relationship not only refers to the social division of labour as defined thus far, but also includes a number of other allocation mechanisms such as the type of skills that need to be available, the type of contract, the wages and so on (*ibid.*: 54ff). Its constituent element is the employment contract. The employment relationship, which is the second subsystem in the organisation, interacts closely with the technical division of labour. In the organisational structures approach, this is defined as the human resources condition, which is the second condition to achieve the organisation's goal. While we have elaborated extensively on the first subsystem in the previous section, it is now time to investigate this second subsystem in more detail.

1.4.2 Membership and the employment relationship

1.4.2.1 From employment contract to employment relationship

A number of researchers consider membership to be a decisive criterion to define an organisation in organisation theories, as illustrated by the following citation from Ahrne and Brunsson (2005: 431): 'Members are necessary if organizations are to exist and to act at all'. The issue then is to define who is a member of the organisation and who is not. As summarised by Van Hootegem (2000: 45ff), this requires specification of the entry and exit conditions. In the type of organisations that are the subject of our study, the employment contract establishes these entry and exit conditions. The employment contract cannot, however, be reduced to a purely legal document signed between two parties (the employer and the worker) (*ibid.*: 56). In order to ensure that the employment contract is adequately implemented, additional regulation is needed which leads us to the broader concept of the employment relationship.

Since long, the concept of the employment relationship is central in several strands of sociology of work, employment and industrial relations adopting a wide range of definitions and approaches (for an overview see Kaufman, 2004). These approaches not only concern the relationship between the individual employer and employee or the organisational level, but also the industrial relations at various levels such as industries and states. Theories evolved a.o. around the questions of the specificities of the bargain of wage to effort and the creation and stabilisation of mutual expectations between employee and employer within the employment relationship. Also economic theories such as the transaction cost approach have been applied to the employment relationship in order to investigate its specificities as contrasted to market relationships. From this perspective it is acknowledged that both parties, employer and employee, develop opportunistic behaviour based on bounded rationality, incomplete information and the pursui of self-interest. The insecurity and conflict potential of the employment contract that result from this require additional regulation for the transaction to be succesful. This additional regulation implies different mechanisms as compared to pure market coordination (Müller-Jentsch, 2004, p. 26, Kaufman, 2004, p. 55). Such rational choice theories have, however, been criticised because of neglecting the social

context and reducing the parties involved in the employment relationship to rationally behaving individuals (Wachter, 2004, p. 173ff).

Focusing on the key issue addressed in the literature of the creation and stabilisation of mutual expectations, the most essential characteristic of the employment relationship, next to determining a range of wage and working conditions necessary to establish job allocations properly, is that it comprises a 'promise to obey orders'. Van Hootegem draws attention to this key function when he builds on the social systems theory of Luhman: this promise to obey orders is functional because of its potential to stabilise behavioural expectations in the organisation. It implies that members of an organisation are expected to act and behave in ways that are meaningful for the organisation. This stabilising element is to be found in the fact that organisation-relevant behaviour can be distinguished from non-organisation-relevant behaviour (*ibid.*).

The reason for the need to stabilise behavioural expectations is well known: the subject of the transaction of the employment contract is not labour, but labour power. The employment contract is open-ended: 'The terms, conditions and performance requirements *[of the worker]* cannot be anticipated and set down in writing ex-ante to the start of the work' (Kaufman, 2004: 55). The key function of the employment contract is to reduce uncertainty over the transformation of labour power into labour and to limit the worker's behaviour to the organisation's expectations, under the condition that it is impossible to precisely specify in advance the work that must be done. Van Hootegem clarifies that the employment contract implies the agreement on an 'implicit zone of indifference': 'This is a zone of mutually accepted (between the organisation and the member) behavioural expectations and conditions. Within this zone, the member accepts that his or her behaviour is directed by the organisation under specific conditions.' (Van Hootegem, 2000: 50, own translation).

In short, the employment contract is the necessary condition for establishing the relationship between the worker and the organisational structure. It is not sufficient, however, to secure the 'promise to obey orders' and the subjugation to managerial control and authority. Additional regulation is also needed to transform labour power into labour. This regulation implies a range of decisions concerning all aspects of the links between the transformation process (the network of interrelated jobs) and the workers with whom the organisation concludes an employment contract. In other words the employment relationship not only includes a legal contract but also covers the various aspects of human resources policies that make it possible to allocate jobs to workers and to reduce uncertainty over the transformation of labour: selection and recruitment, contractual, spatial and temporal aspects of employment, qualification and competence-building, mobility, wages and working conditions and relationships at work (*ibid.*: 54-66, own translation).

At the level of the organisation, this employment relationship establishes a network of what can be called 'membership sets' that will be related to the network of jobs (*ibid.*). It should be emphasised that we initially identified three key allocation mechanisms in the organisation which were defined as dimensions of the social division of labour: the inter-organisational, spatial and temporal division of labour. In order to establish the employment relationship and membership sets that make it possible to access workers who will do the work as expected, the organisation will have to complement these three allocation mechanisms from the range of additional decisions that was listed. These organisational decisions will be jointly and directly reflected in the individual employment relationship between the organisation and the worker.

1.4.2.2 Membership and blurred boundaries

Using the employment contract as a way to define the boundaries of an organisation and distinguish members from non-members has become a complex matter in modern organisations. The reasons for this are diverse. One factor is that employment contracts within each organisation are increasingly diverse. There are workers with open-ended contracts and workers with a variety of temporary or fixed-term contracts, and these contracts may range from a very small number of working hours to extremely long overtime hours. To deal with this variety it is possible to apply the principle of equifinality or functional equivalence, meaning that there are multiple ways to achieve a goal. Functional equivalence makes it possible to substitute different indicators of the same subject and this is 'the natural way to incorporate historical and cultural diversity into the larger theoretical framework' (Goertz, 2005: 63). In the context of the employment contract it is a useful principle to establish 'the predominance of functionality over formalistic appearances' (Van Hootegem, 2000: 56, own translation). The essence of the existence of various legal employment contracts is that they constitute a range of formally different solutions to the same functional problem for the management, which is to have a workforce at its disposal to do the work as expected. The principle of functional equivalence makes sense because part of the diversity in employment contracts within an organisation is explained by the institutional mechanisms that regulate the employment contract at different levels (the state, the industry, the organisation and the individual). Consequently, the specific terms of the employment contracts with workers should not be regarded as decisive in defining a worker as a member or not. The mere existence of an employment contract is sufficient to do so.

This institutional complexity is not, however, the main problem associated with the growing blurring of organisational boundaries. Within the same walls one will also find people in a range of different employment situations for reasons other than the institutional complexity. At a single site there may be subcontracted security and cleaning staff, a freelancer setting up the company's website, university researchers seconded to the R&D department, people in internships, temporary staff replacing employees on sick leave, etc. Such workers, who may be physically present at the organisation's premises for considerable periods, have employment contracts with other organisations (the university, the security company, the service provider, the temporary agency, etc.). Conversely, the 'organisation' is not only present at this one physical location: apart from workers working for its domestic or international subsidiaries, the organisation may equally send out staff to other organisations for longer or shorter periods, to collaborate with others in project teams, for training, to help out customers, etc.

In the studies addressing the employment relationship in different contractual forms of inter-organisational collaboration to which we referred earlier in this chapter, Flecker (2010) analysed this growing complexity as 'fragmentation of employment' and Marchington *et al.* (2005) refer to 'fragmenting work and the blurring of organisational boundaries'. Specifically with reference to the growing number of services that are increasingly organised remotely with the help of ICTs, Smith further observes: 'Although most service work remains within management control systems and a work*place*, the idea of 'work' as organization-centred is being undermined - de-centred, stretched spatially and temporally, as services move to 24/7 access and labour reserves are sourced by price on an increasingly global scale' (Smith, 2010: 272, emphasis in the original). In the cases listed, the diversity of employment contracts at one site does not reflect functional equivalences related to institutional and regulatory complexity but results from the range of contractual forms of collaboration with other firms to carry out part of the organisation's activities on site or, in other words, is related to the complexity of modes of economic governance. In fact this issue is not new and it is raised in

more general terms, for instance in the extensive literature on temporary staff agencies and secondment arrangements where a triangulation of the employment relationship occurs. However diverse the situations may be where such triangular relationships exist, these seconded workers should be considered primarily as members of the organisation with which they concluded their original employment contract.

Nevertheless it is still relevant to elaborate upon the question of how to interpret the link between the externally contracted workers and the organisation where they actually carry out their work, that is: where they transform their labour power into labour. Our interest in elaborating on this question is related to the issue of the functional coordination of production structures which, as we have seen, is influenced by increasingly complex patterns of division of labour, and which transcends the physical and contractual boundaries of a single operational unit. In some cases it is not particularly difficult to classify this link between 'external' workers and the organisation, especially in cases where on-site outsourcing is used for activities that are not regarded as primary activities to realise the organisation's objectives but can only be carried out on the spot. Obvious examples are maintenance, catering, cleaning, security, etc. The workers carrying out these activities are members of the contracted service providers because the management of the client company has deliberately chosen *not* to engage in employment relationships with the workers engaged in these activities. The fact that such services are provided on site with the customer can often be explained by the 'uno acto' principle, which makes it inevitable that the service is produced where it has to be consumed. Consequently there is no alternative to working at the customer's premises and it is still the employer who decides, sometimes on a day-to-day basis, where the service will be delivered. While the membership situation is clear, another issue is the question of how these workers perceive themselves. Research has shown that situations in which workers are present at a client site on a long-term basis may lead to a shift in their identification and loyalty towards the client company. These workers tend to see other workers present on this site, whether they are employees of the client-company or of other subcontractors, as their colleagues rather than their formal 'colleague co-members' working on other sites and for other clients (Martinez, 2007; Pauwels, Ramioul & Van Peteghem, 2012).

Nevertheless, in other cases, as the examples show, the boundaries between the organisation and other organisations may be more blurred. It may happen that a small part of a regular in-house business function is outsourced or that external employees (temporarily) carry out work that is normally organised in-house because it is still considered to be of primary importance in order to reach the organisation's goal. There are, in other words, situations involving very close links and strong interdependencies between outsourced and in-house tasks on a particular site. Workers from different companies may work alongside each other and interact systematically to successfully complete the work, sometimes for long periods. To summarise a few examples, these include different forms of project work bringing together workers from different firms, for instance in software development or on (large) construction sites; secondment of university staff to the R&D unit of a company to develop a product; internship situations, the implementation of complex technical infrastructures on a site involving close interaction with end-users; subcontracting of part of the work in situations where the capacity of the regular workforce is inadequate or to cover a peak in demand and so on. Since they are highly involved in the organisational structure at a particular site, the tasks of these external workers are jointly functionally coordinated with those of the 'real members' and they are quite likely to be expected, at least to some extent, to follow instructions from the local management. In practice, it may be difficult to distinguish these workers from the regular ones, not least for themselves.

Although their membership is theoretically not discussed, ambiguity about the status of these external workers is again caused by the fact that some, but not all, conditions of the employment relationship are separated and regulated in another organisation and in another place. Examples might include working time schedules, technical tools and infrastructures to be used, health and safety regulations, operational working relations, specific training opportunities, environmental working conditions, etc. Generally speaking, those working conditions intended to regulate and coordinate concrete tasks are likely to be determined on the client's site. Several of these conditions are linked to the functional coordination of the production process. Who decides what will depend on the concrete working environment and on the specific contractual terms of the outsourcing contract, but there may well be a grey zone when it comes to the day-to-day management of these workers. From this perspective, the 'fragmentation of the employment relationship' and the 'blurring of organisational boundaries' referred to by Flecker (2010) and Marchington *et al.* (2005) may sometimes give local management far-reaching authority over non-members. It may also make a particular site the crucial locus for the organisation of the work because the work of all workers who have a task, regardless of their employment contract, is likely to be functionally coordinated by the same set of organisational coordination mechanisms (technical infrastructures, administrative procedures, staff interventions, etc.).

In sum, while the conditions for the exchange of labour power for wage may be defined in the employment contract, it is in the actual labour process of another organisation that this exchange is eventually materialised and labour power is transformed into concrete labour effort. As a result, part of the managerial authority is disconnected from the employment contract and from the place where the employer is located.

The growing complexity of the division of labour thus results in the fact that the physical location is not, in itself, a suitable criterion to define the organisation's boundaries because workplace, work, employment contracts and managerial control are increasingly disconnected. This disconnection implies a separation of the two constituent dimensions of the employment relationship, the employment contract and employment regulation. This points to the fundamentally different conceptual nature of these two dimensions. In the case of the contract, the employment relationship is established first and this first dimension is a necessary condition on its own. Employment regulation makes it possible to implement the contract and it is therefore an equally necessary condition, needed to reduce indeterminacy and to allocate workers to the tasks of the organisational structure. The two dimensions are jointly necessary and sufficient in order to establish the employment relationship. Employment regulation is not, however, sufficient on its own; it complements the contract. Moreover, the different aspects of the employment regulation can be characterised as highly contingent in time and space. The regulation dimension encompasses a whole set of decisions and choices, but each of these decisions and choices is not individually necessary in order to define and 'complete' the employment relationship and not all possible aspects of regulation need to be put in place in order to reduce indeterminacy. In contrast to the employment contract, which is necessary on its own, it is sufficient to determine only part of the regulatory aspects to secure the employment relationship, rather than the whole set. Consequently, some of these dimensions of regulation may be transferred elsewhere, to a client organisation. The recent trend towards payrolling, for instance, demonstrates how far employment regulation may be 'stripped off': in payrolling, an organisation outsources all its administrative responsibilities as an employer to a third organisation, which hires the personnel and becomes the formal, legal employer. In practice, however, the client organisation, where the worker is working on a quasi-permanent basis but is not a 'member', decides on virtually all non-contractual aspects of the employment contract (Mol & Daems, 2012).

This fundamental difference between the two dimensions of the employment relationship, the contract and the regulation, can be captured in terms of their different conceptual structure: while the legal contract has a 'necessary and sufficient condition' structure, the regulation dimension of the employment relationship can be defined in terms of a 'family resemblance' structure, which categorises concepts on the basis of a range of similar, overlapping features rather than by one essential common feature (Goertz, 2005).

What are the consequences of this digression for the present study? First, it is important to reiterate that our primary interest is to look at the restructuring of activities and tasks across a distance, the changes in the spatial division of labour, rather than to investigate in detail the specific contractual and regulation features of workers who are allocated to them (wages, working times, etc.). Second, in the analysis of a restructuring process and its outcome, our point of departure is the organisation where the restructuring is initiated and we will focus on the effects and changes in that organisation. Consequently, our interest must be primarily focused on those workers who are members of this organisation, *i.e.* those who have an employment contract with the organisation under investigation. Third, to the extent that the spatial restructuring of activities implies outsourcing, we consider it relevant to include in the analysis those workers at the destination company who are linked to the restructured production process because they are at least partly subject to its functional coordination infrastructures and mechanisms. The fact that part of the employment regulation is transferred to the client-organisation is considered a sufficient condition to assume that their tasks will be at least partly functionally coordinated on that site. This functional coordination has a process-oriented perspective and involves all operational staff in the organisation leading to a certain degree of analytical equivalence between intra- and inter-organisational coordination.

1.4.2.3 The organisation and the labour process approach

So far, we have clarified how to address 'the organisation' when investigating spatial restructuring. To reiterate, we see organisations as goal-directed social systems consisting of two subsystems: (1) the organisational structure based on decisions about the structure of the technical division of labour and leading to a network of related jobs, and (2) the employment relationship based on the decisions concerning the membership sets of the organisation which aim to allocate workers and reduce uncertainty on the transformation of their labour power. The merit of this model is that it helps to meet the concerns we raised with regard to the use of the business function and global value chain as generic analytical concepts for investigating spatial restructuring. The organisational perspective that has been presented makes it possible to analyse changes in the spatial allocation of jobs of the production structure as decisions driven by managerial strategies to achieve organisational objectives. Moreover, the employment relationship as an essential subsystem of the organisation also comes into view and more specifically this includes the non-contractual arrangements which encompass a range of employment regulation aspects that complement the initial terms of the employment contract. This prevents any analysis that abstracts too far from the organisational context and the complex and multidimensional relationships between the organisation and its members in which restructuring decisions are embedded.

As regards the organisational boundaries as defined in the employment relationship, our decision to include both in-house and outsourced spatial restructuring events means that, for our study, the functional coordination of a transformation process is considered to be more relevant than the economic coordination mode of its different subdivisions. While this does not mean questioning the basis, in principle, of organisational membership (and thus the organisation's boundaries) as constituted by the employment contract, it does seem appropriate to include all workers who are subject to the same functional coordination mecha-

nisms, since this functional coordination is likely to be affected by spatial restructuring as well as by possible changes in the production structure that may be related to them. This may additionally offer opportunities to find indications for differences or similarities in the outcome of spatial restructuring in different economic governance modes.

In the employment relationship, the open-ended nature of the employment contract came to the forefront as a distinguishing and determining feature. The issue of insecurity in relation to the worker's labour effort, which is generally referred to as indeterminacy, is not only fundamental in the organisation theory we use but it is also the key foundation of the labour process approach, which is rooted in Marxist theory. The reason why the 'transformation problem' (Müller-Jentsch, 2004: 8) is central to the labour process approach is because this transformation is a key condition for the creation of surplus which forms the foundation for capital accumulation. Capital accumulation is a necessity for the existence of organisations under capitalism (Sayer 2004: 10). Since capital accumulation is essential, so are the employment contract and the various non-contractual mechanisms of the employment relationship which are necessary to materialise labour power. Smith clarifies the particular nature of labour power, which is: '(...) the element in the labour process that is uncertain, embodied, external and with an essential duality - the *person* of the worker is not what the employer actually wants, but rather only the labour services (...), which is the "property" stored in living labour and carried into the labour process by the worker' (Smith, 2010: 269, emphasis in the original). Elsewhere the author states: 'Indeterminacy remains the conceptual key to understanding the material foundation of workplace antagonism between employers and workers' (Smith, 2006: 390). Due to indeterminacy, the employment contract requires permanent monitoring, follow-up and bargaining by which both parties try to define the indeterminacies to their own benefit.

Overall, considered from the Marxist perspective in which the labour process approach is rooted, the relationship between labour and capital is a central dimension of the organisation and, consequently the labour process is defined as 'the location where the specific set of relations between capitalists and workers is produced, reproduced and transformed' (Fleetwood, 2005: 45). There are, however, many ways in which the condition of capital accumulation can be materialised. Authors on the labour process approach assert that the precise way in which labour power is transformed is contingent on the internal structure of organisations in terms of jobs ('work') and employment regulation. Nevertheless, there is always a mix of control and autonomy and of collaboration and resistance, albeit in these contingent combinations, since fundamentally, 'there are always simultaneously conflicting and shared interests' (Kaufman, 2004: 67).

With this definition of the labour process and the acknowledgement of the structuring effect of both the internal job structure and employment regulation, the labour process approach is not incompatible with the definition of the organisation as explained by the STOSA. The perspectives of both approaches on the employment relationship, essentially built upon the indeterminacy principle and including a range of organisational mechanisms to materialise labour power, also do not appear to be contradictory. The STOSA emphasises the differences in power between the organisation and its members as structural and generic on the basis that it concerns a relationship between a human, a person, and a non-human system, the organisation, to which he or she is subjected (Van Hootegem, 2000: 49). Authors writing on the labour process analyse power imbalances between management and workers from the perspective of the antagonistic relationships between labour and capital under capital accumulation conditions. This power imbalance is rooted in the fact that, on the one hand, workers have no choice but to engage in paid work, which subjugates them to the employer, and on the other hand the indeterminacy of the employment contract. Overall, we

conclude that both approaches present themselves as feasible for the purpose of investigating spatial restructuring events as we intend to do because, in their analysis, they both include the technical division of labour as well as the employment relationship as the two constituent dimensions of the organisation as a social system.

Nevertheless, each has its own specific merits and contributions, rooted in its respective longstanding theoretical work and research tradition. The benefit of the social systems theory as underpinning the STOSA approach is, as has been explained, that it provides a strong basis on which to build an extremely useful analytical scheme to observe and understand the structure of the technical division of labour of organisations in a comparative perspective. As was stated very early in this chapter, by focusing the analysis on the actual tasks of a spatial restructuring event, we aim to add value to sociological approaches that investigate restructuring primarily from the perspective of contractual relations and employment conditions. It was therefore appropriate to elaborate in detail on the STOSA that will enable us to achieve this.

On the other hand, as was also emphasised at the outset, we also want to investigate the effects of the strategies and agency of management and workers on the process and outcome of spatial restructuring. It has already been stated that several of the approaches and disciplines investigating inter-organisational relations can be criticised for neglecting or insufficiently emphasising the fact that corporate strategies are developed in a context that is also determined by these social relations. From this, it is argued that managerial control, the agency of workers and the complex and contradictory interactions between them play a fundamental role in the shaping and reshaping of labour processes. To reiterate a previous quotation, such a labour process analysis implies: '(...) an empirical interest in the experience of work at the point of production and a theoretical concern with the contradictory relationships between capital and labour' (Edwards, 2010: 42). Referring to our definition of the organisation, it implies giving a central role to managerial strategies and decisions on the structure of the technical division of labour, the contractual and spatial allocation of work and the other dimensions shaping the employment relationship. These decisions will generate behavioural expectations towards workers that can be characterised as contingent and dynamic combinations of control and autonomy. As a result of conflicting and coinciding interests, agency of workers can be characterised as combinations of collaboration and resistance.

The aim in adopting this perspective in the present study is to add value to research that tends to underrate the role of these social relationships in organisational shaping. At this point, the labour process approach has a strong research tradition of analysing and understanding the labour process as the place where management and workers meet in structured antagonism. In particular, its acknowledgement of the dynamics of the employment relationship and of the contradicting but coinciding strategies of autonomy and control and compliance and resistance within the organisation makes it possible to understand why the strategies and agency of management and workers are essential in the 'production, reproduction and transformation' of labour processes.

Consequently, both approaches prove to be complementary for the research endeavours in our study. Now that the model for analysing the technical division of labour has been extensively clarified, we will now dig deeper into the agency of management and workers as conceptualised in the labour process approach.

1.4.3 The employment relationship and the labour process approach

1.4.3.1 Indeterminacy and managerial strategies

In our exploration of theories on the division of labour, the work of Braverman (1974) which laid the basis for huge strands of research, came prominently to the fore. The key message of Braverman's description of the increasing technical division of labour through scientific management and Taylorist management techniques was that these were the prime strategies to acquire control over workers and their knowledge. In the Marxist tradition, power and control in the workplace are central issues. Generally, research rooted in the labour process approach and based on Braverman has kept abreast with economic, technical and managerial developments such as the growth of service work, globalisation and different waves of technological innovation and the impact of these on work and the emergence of new managerial paradigms, such as high involvement workplaces, lean production and other new forms of work organisation. Debates on the theoretical foundations of the labour process approach as well as empirical research building on these, still occupy an important place in industrial sociology. The labour process approach includes different substreams and has a vast research tradition but it is the deskilling and upskilling debate, for which Braverman laid the ground, that is still of particularly central concern (for overviews see *e.g.* Adler, 2004; Sawchuk, 2006; Grugulis & Lloyd, 2010).

At a more fundamental level of labour process dynamics is the explanation by Marxist authors of the fundamentally contradictory relationship between the forces of production and the relations of production. The basis for this lies in the distinction between use-value production and exchange-value production. The production of use-value refers to the basic need of humans, workers, to create, 'play' and produce, and to learn by doing so. Use-value is fundamental to all human activity and is created not only in the private sphere but also within the labour process. Exchange-value is produced when use-value is commodified under capitalist production relations. As economies expand, use-value is increasingly organised according to the principle of exchange-value production (Sawchuk, 2006). Use-value created within the labour process is, however, still important and is reflected for instance in the fact that workers take pride in their work (Edwards, 2010: 33), regardless of their skill level and the type of job. The distinction between use-value and exchange value production is therefore basically an analytical one (*ibid.*: 35). As this distinction and the importance of use-value within the labour process will prove important when we consider knowledge in the labour process, we will come back to this premise in Chapter 2.

In the earlier works on the labour process approach, and drawing on Braverman's (1974) work, managerial strategies based on the standardisation of work and aiming at control and compliance of workers were central to explanations of the commodification process. Gradually, a more nuanced view came to the fore, emphasising that managerial strategies are based not only on control and compliance but also on collaboration and consent. Hence, since management seeks a stable working environment and stable employment relations in order to realise its objectives (Thompson & Newsome, 2004: 135; Grimshaw, Willmott & Rubery, 2005: 60), it was acknowledged that the structural contradiction between the forces of production and the relations of production ultimately cannot be resolved by coercive managerial strategies alone. Based on a broader view of managerial control, Marsden, for instance, argues that there are two necessary and sufficient conditions for the creation of a workable employment relationship within the framework of the indeterminate employment contract: enforceability and efficiency (Marsden, 2004: 81). Enforceability relates to the rules that have the effect of forcing the employee to work (to obey orders). Efficiency relates to the fact that this work needs to be useful to the organisation: the competencies of the employee must be

relevant to and adequate for the requirements of the production structure. Earlier we referred to regulation as the encompassing concept that secures the transformation from labour power into labour. The condition of efficiency as brought forward by Marsden (*ibid.*) makes the allocation and mobilisation of skills and knowledge a central concern in the organisation. Indeterminacy and workers' knowledge are intrinsically connected, as will be explained in Chapter 2. Viewed from this perspective, management needs to develop collaboration strategies in order to persuade and motivate workers to use their skills for the benefit of smooth and efficient work processes, to find flexible responses to unforeseen problems, to contribute to innovation, etc. Cooperation and consent are the necessary complements to control and compliance and are equally fundamental in the employment contract and in the continuous bargaining on its implementation which is needed to produce stability, reduce uncertainty and minimise the risks of conflict for both parties.

This idea is present in the wide range of studies, longstanding theoretical development and intense debate that has centred on the dialectics between autonomy and control in the labour process. We will limit ourselves here to emphasising that it is now widely recognised that control in the labour process can be based on a variety of mechanisms, sources and forms (for overviews of the literature and research on this issue, see Damarin, 2010; Sturdy, Fleming & Delbridge, 2010). Managerial control can range from hierarchical structures and direct authority to indirect forms achieved by socialisation, norms and regulation, such as exerted by occupational groups, professional codes, skill certification, peers, colleagues in the workplace and in teams, and even customers. Authors such as Burawoy (1979), Edwards (1979) and Foucault (1982) were significant in that they laid the foundations for the recognition that workers may also become complicit in their own domination. One illustrative approach in this strand is developed by Doorewaard who identifies different mechanisms for the production of consent (Doorewaard & Brouns, 2003). In the tradition of the 'normative control approach', Doorewaard uses the concept of hegemonic power to describe the strategy of 'management by seduction' whereby employees are induced to consent to dominant organisational views and accept their insertion into organisational practices despite the possible disadvantages these might have. Rather than bureaucratic rules, authoritarian behaviour or aggressive action, hegemonic managerial power is established by much more subtle processes of meaning and identity formation, resulting in subordination to power without being fully aware of it (*ibid.*). The mechanism is seduction (rather than threat) which generates an implicit and gradual process of acceptance of authority or, in this case, of organisational practices even when they may have disadvantages (*ibid.*). Other authors on normative control similarly describe mechanism whereby the very 'selves' of workers become the key mechanism of control (Sturdy, Fleming & Delbridge, 2010: 116). Sturdy, Fleming and Delbridge (2010) take this premise a step further when introducing the concept 'neo-normative control' defined as: 'Neo-normative control then involves the selective enlistment of the private dimensions of employee selves, usually under the rubric of individualism and free self-expression as a way of extracting behaviour amendable to organizational objectives' (*ibid.*: 119). In this way these authors reinterpret management rhetoric and practices concerning diversity, the 'celebration of difference' with respect to lifestyle, etc., and the encouragement of self-expression and even criticism of the management as new forms of hegemonic power.

While these diverse forms of control refer to managerial agency, it is, however, equally important to include and acknowledge active employee agency in the analysis of the employment relationship.

1.4.3.2 Employee agency

Clearly, the second dimension of the employment contract, 'the promise to obey orders' primarily focuses on the role of management in defining the conditions for the employment relationship and to the fundamental inequality in the employment relationship where the employee is subjugated to the employer because he or she has no other choice but to sell his or her labour. From this perspective, the terms 'disciplination' of the workforce or 'enforcement' are originally used to denote managerial strategies to secure the expected behaviour from workers (either by control or through collaboration and granting autonomy). Meanwhile, views on the relationships between management and employees are more balanced and the active agency of workers, rather than their merely defensive resistance to this subjugation, becomes more prominent. Since not only management may benefit from cooperation, authors also emphasise the role of the consciousness, identity, consent and dissent, agency and social interaction of workers. Thus workers are 'recovered' as acting subjects rather than as mere objects of control (Sawchuk, 2006: 602). This acknowledgement of active agency can be grounded in the fact that the employment contract is more than a 'promise to obey orders' but also enables workers to fulfil their needs. The fact that their direct need for the creation of use-value, and their indirect needs such as the acquisition of purchasing power to buy goods and services on the market, are realised through the employment relationship is reflected in cooperation and consent.

The acknowledgement of the active agency of workers is an important point. One of our key research questions is to investigate how workers may influence the actual process and outcome of spatial restructuring. While spatial restructuring will be initiated by the management of the organisation and behaviour of employees will essentially be reactive, this research question directs attention to the workers involved. It is therefore relevant to explore some additional pointers towards the types of behaviour to which employee agency may refer.

It has already been stated that the literature makes a basic distinction within employee behaviour between compliance and collaboration *versus* conflict and resistance. Both types may refer to either the individual employee or to workers collectively. We leave aside forms of organised and of collective behaviour such as investigated in the broad strand of theories and research on industrial relations and forms of organised opposition such as strikes and collective action.

Our focus is on individual agency as it exists in the day-to-day labour process and as it is determined by the conditions shaped by the organisational design. An overview of theories and research on 'resistance, misbehaviour and dissent' made by Collinson and Ackroyd (2005) indicates that there are very different forms of oppositional agency by employees, some of which constitute open confrontations, such as sabotage or work limitation, while others are more subtle, even including subconscious forms of disengagement such as absenteeism, cynicism or even humour (Thompson & Smith, 2010: 20). When linked to indeterminacy, such oppositional forms of agency have been analysed as a means of allowing workers to adjust the bargain of the employment contract, *i.e.* to re-balance effort to wage (*ibid.*). The analysis of oppositional employee agency by authors on the labour process is more complex and takes account of different and coinciding forms of subversion and resistance. To understand this, reference is made to the behaviour of management as rooted in the fundamentally contradictory nature of capitalist employment relations: 'Typically, managers seek to harness employee commitment and creativity while limiting this very same worker's discretion because that might be applied in ways deemed unacceptable. These contradictory managerial practices seek to manufacture consent while also exercising coercion.' (Col-

linson & Ackroyd, 2005: 314). Employee resistance is then regarded as a mirroring reaction against such ambiguous managerial behaviour.

Collinson and Ackroyd (*ibid.*) emphasise that forms of employee resistance need to be analysed in close relation to concrete workplace practices and managerial strategies. For example, they observe how cynicism may be regarded as a typical form of employee resistance in work situations where there is a high discrepancy between official managerial policies and discourses and their actual practices. Such an employee reaction may be regarded as 'psychological distancing', which is more typical of relatively new forms of organisational practices and discourses. These forms of worker behaviour can be distinguished from more traditional forms of resistance typical in Taylorist work organisations where sabotage, pilferage, soldiering or effort restriction were more feasible and effective forms of employee reaction (*ibid.*: 318ff). Huws (2011: 517) also argues that: '(...) each form of control evokes a different form of resistance'. Bélanger and Thuderoz (2010: 144ff) relate management control, ranging from subjection to responsibilisation, to employee behaviour, ranging from commitment to work to opposition, to identify different modes of employee opposition, including rebellion and militancy but also retreat and cynicism (*ibid.*: 147). The authors emphasise that management control and employee commitment are not mutually exclusive binary categories but, on the contrary, coincide. They underscore the interaction between worker and management behaviour.

A final interesting conceptualisation of employee agency in the labour process approach is the notion of 'appropriation', which refers to 'an active set of practices that attempt to recover a degree of autonomy at work' (Fleming, 2001: 190-1, referenced from Thompson & Smith, 2010: 19). Four distinct 'loci' of appropriation are distinguished: working time, working effort, the product of work and work identities. Thompson and Smith (*ibid.*) argue that the term appropriation is conceptually innovative because it moves beyond the control and resistance model by emphasising the active agency of workers and because it focuses on 'identity' rather than only on subjectivity, which makes it possible to acknowledge worker's interests.

1.4.3.3 Job crafting

Alongside resistance and 'misbehaviour', workers may thus also behave in ways that are not by definition contrary to the organisation's objectives and which aim to fulfil their own needs by appropriating or recovering a degree of autonomy in terms of working time, working effort, the product of work and work identity. In the same realm of agency, we may refer to the concept of 'job crafting'. Developed within the field of applied psychology, the concept of job crafting is used to describe different forms of intervention whereby workers actively shape the tasks, social relationships and cognitive meanings that compose a job (Wrzesniewski & Dutton, 2001). Drawing on a social constructivistic paradigm, Wrezniewksi and Dutton describe how even in the most standardised and routinised jobs workers can exert some influence on what is the essence of their work and that they are key actors in 'constructing' their job. While the job is defined as 'a set of task elements grouped together under one job title, linking the employee to the organisation' (Ilgen & Hollenbeck, 1992, referenced from Wrzesniewski & Dutton, 2001), job crafting implies that these tasks are altered by the employees in different ways: '(...) by changing the form or the number of activities one engages in while doing the job, whereas changing cognitive task boundaries refers to altering how one sees the job (*e.g.* as a set of discrete parts or as an integrated whole), and changing relational boundaries means exercising discretion over the people with whom one interacts while doing the job. By changing any one of these elements, an individual alters the design of the job and the social environment in which he or she works.' (Wrzesniewski & Dutton,

2001: 180). Changing the type, scope and number of tasks that one does and changing relational boundaries are self-evident. Changing the 'cognitive task boundaries' is defined by these authors as altering the view of work either as discrete parts or as an integrated whole. This can basically be understood as different forms of identification with the job and/or the organisation and changing cognitive boundaries (taking more responsibility, ascribing new meanings, etc.).

In its description, job crafting is not specifically defined as a form of either resistance to or compliance with managerial authority. According to the authors, workers craft their jobs to create work with which they are more satisfied. The outcome of job crafting may benefit the organisation, for instance if workers do more work than they have to or if they interact with people other than those they have to in order to perform better. The authors state in this respect: 'Whether this crafting is "good" or "bad" for the organization is an issue that is situationally dependent' (*ibid.*: 180). Wrzesniewski and Dutton refer to perceived opportunities as the motivation for job crafting, although they acknowledge that this perception is rooted in the task structure, that is in: '(...) (1) the level and form of task interdependence and (2) the level of discretion or freedom to job craft implied by monitoring systems in the job' (*ibid.*: 184). The level of task interdependency refers to the extent to which the items or elements on which work is performed or the work processes themselves are interrelated so that changes in the state of one element affect the state of the others (*ibid.*: 184). According to the authors, the more interdependent the tasks, for instance because one has to collaborate with colleagues, the less opportunities the employee sees for job crafting. Similarly, when jobs are explicitly controlled, employees may see less opportunity for crafting their activities. If, on the other hand, there are high levels of discretion, the perceived opportunities to craft the job are considerable. When employees have a lot of autonomy to choose the sequence of their tasks, their methods, the people they interact with to do their job, etc. they have ample opportunity to craft the job to suit their own needs.[13]

The authors state that 'motivation to craft a job will most often result from situations in which employees feel that their needs are not being met in their job as it is currently designed' (*ibid.*: 183). The merit of the concept, as the authors emphasise, is that it changes the direction of the relationship between the employee and the job. In contrast to the job design perspective, which is concerned with the impact of job design characteristics on employee motivation and attitudes, job crafting looks at how employees change the job design to suit them better (*ibid.*: 181). This reversal in the direction of the relationship between the individual and the job is interesting in that it acknowledges the importance of the worker's active role in task execution and the fact that this ultimate task execution does, as a rule, tend to deviate from formal work instructions. We will come back to this issue in Chapter 2.

1.4.3.4 Concluding points on employee agency

Job crafting, as defined by Wrzesniewski and Dutton (*ibid.*), is essentially confined to the relationship between the individual and his or her job and is analysed from the psychological perspective of the worker. This contrasts with our conceptual framework in two respects. First, our perspective is to look at how tasks define opportunities for employee agency and not at the employee's perceptions and motivations in their job. Second, in this approach neither the relationship between the individual and his or her job nor job crafting are situated in the broader context of the labour process, made up of the organisational structure subsystem and the employment relationship subsystem. Job crafting is not conceptualised as a

13 In the WALQING framework project, the concept is applied to extremely distinct settings but with similar occupations, ranging from high levels of discretion to high levels of standardisation, to explore the relationship between task structures and job crafting (Pauwels, Ramioul & Van Peteghem, 2012).

form of appropriation aiming to restore the balance between wage and effort or to recover the worker's autonomy and identity in the dialectic with management. Consequently, the structuring role of the employment relationship in defining the conditions for employee agency tends to remain out of sight. Explaining job crafting on the basis of the individual needs of the employee gives rise to the risk that other, more fundamental explanations will be ignored, such as those provided by the labour process approach. In particular there is a risk of overlooking the way in which the labour process is structured, involving a mix of autonomy and control, and the dynamics of collaboration and conflict.

The conclusion that employees in standardised and highly controlled jobs see fewer opportunities to craft their jobs also seems to be out of line with the labour process approach, which interprets specific forms of agency, namely resistance or collaboration, as responses to and forms of interaction with specific managerial strategies. From this perspective, the forms of employee agency will equally be determined by the organisational structure but it does not conclude that workers see fewer opportunities for agency, such as resistance, when their jobs are highly standardised. The history of the organised labour movement demonstrates that it was precisely Taylorised organisations and standardised work organisations that created an important basis for the emergence of resistance, collectivisation and collective action, because these work organisations are particularly sensitive to conflict and collective action. In Chapter 2, the issue of (individual) employee agency in different types of organisations, including those where work is standardised, will come up again.

To conclude, the importance of elaborating on both managerial strategies and employee agency in the context of the employee relationship can be seen in that these provide the final piece and concrete anchors that may shed light on the way in which the organisational level 'makes the difference' in the process and outcome of spatial restructuring. One fundamental argument for fitting the organisation to the analysis, rather than limiting it to a business function or another segment of the production process as part of a global value chain, is based on the employment relationship. On the one hand, this comprises strategies on the allocation of workers and aims to reduce the insecurity concerning the transformation of labour power into labour that exists alongside the employment contract. On the other hand, in the dynamics of the labour process, the agency of workers must be acknowledged. While power imbalances between the organisation and the member should not be neglected and employee agency is principally responsive rather than pro-active, it is rooted in indeterminacy and in the structured antagonism of employment relations. A central question is how this complex social context will influence the processes and the outcomes of spatial restructuring.

1.5 Summary

We can now summarise the five different steps taken in the construction of our theoretical framework to investigate spatial restructuring. As a first step, we clarified our decision to focus on the spatial dimension of organisational restructuring events. We have opted to analyse the spatial redistribution of tasks in a transformation process which may occur either within the confines of a single organisation (including its units at different locations) or may be accompanied by contractual outsourcing to another organisation. The key question in the study is to ascertain whether or not such changes are related to changes in the technical division of labour.

In a second step, it was decided to adopt a theoretical perspective to investigate spatial restructuring, on the basis of an exploration of a range of economic and sociological theories and studies that focus on trade relations between firms. The primary concern of economic theories is to identify different economic drivers and antecedents of inter-organisational col-

laboration and the establishment of networks, while their main focus is on effects on economic performance. Our objective, in contrast, is to analyse changes in the actual labour process and tasks. We chose to do this because we want to contribute to insights in comparison with sociological research that focus primarily on the effects on employment contracts and relationships in contractual modes where employees change employers (such as multi-employer work situations) but where a spatial relocation of the work is not by definition involved and/or considered. Another objective is to open up this analysis of inter-organisational relations to the labour process perspective and to investigate how the agency of management and workers impact on the processes and outcomes of spatial restructuring.

We then turned to theories and approaches which are relevant to these two objectives in order to build a theoretical framework. To understand spatial restructuring as a change in the division of labour, this concept was clarified further. One key issue is the way in which divided transformation processes are linked and coordinated. Here it was emphasised that alongside and in addition to economic coordination, functional coordination mechanisms must be put in place whenever there is technical division of labour and particularly in spatially dispersed processes. This functional coordination is necessary to bridge the temporal and spatial gaps between interdependent tasks and therefore involves all layers of the organisation in infrastructures, day-to-day procedures and processes. Our focus on the technical and spatial division of labour gives a prominent position to such functional coordination. In addition we need a framework to observe and empirically analyse changes in the division of labour, and creating this was our fourth step in the construction of our theoretical framework.

Our starting point here was current research on global value chain restructuring because the global value chain and the concept of the business function, which is at the centre of its empirical observations, are potentially interesting metaphors for the different steps in the transformation process to deliver a product or service. However, three problems arose. First, rather than an input-output model, we need a more fine-grained framework and vocabulary to describe the technical division of labour and identify changes in it at different levels: the organisation, business functions and also their component tasks. Second, the business functions which can be identified in an organisation, are themselves the outcome of division of labour processes shaped by managerial decision-making rather than generic analytical categories. Third, when looking at either global value chains or separate business functions, there is a risk that the organisation, as the locus of both this managerial decision-making and the employment relationship itself, will be left out of the observation.

As a third step in building the theoretical framework we tackled the first problem, which concerns empirical observation of the technical division of labour. This was addressed with the help of the SocioTechnical Organisational Structures Approach (STOSA). Combining subsequent steps in the coupling or decoupling of generic system functions enables us to see how certain functions are organised as separate business functions within an organisation, while it is more difficult to identify these as such in another organisation because they are functionally deconcentrated. The lower levels of differentiation and task specialisation and fragmentation enable us to describe successive steps in the technical division of labour right down to the subtask level. The fact that production structures may be designed according to different coupling and decoupling principles results in organisational variety even in similar transformation processes. The combination of design principles at different levels eventually shapes the network of individual jobs that are assigned to workers. This approach also addresses functional coordination as part of the regulation and control structure of the organisation.

The importance of this model also lies in the fact that the technical division of labour is decisive in determining the job content and thus the knowledge and skills used in the job and the learning that occurs. This is important when we consider the role of knowledge of production processes during restructuring in the following chapter and assess the impact of spatial restructuring on job quality.

Our fourth step was to address the organisation. Three constituent dimensions of organisations were highlighted. First, the organisation can be described in terms of its key goal which is 'organising transformation processes under the condition of meaningful survival'. This key goal is decisive for decisions on the technical division of labour in primary activities. When looking at the organisation as a social system, the resulting organisational structure is conceived as the first subsystem. Second, managerial decision-making concerns the allocation of jobs: whether these will be organised in-house or acquired through trade relations, where they will be located and with what temporal arrangements. In addition, a range of other allocation decisions are required in order to establish membership sets that link workers to the network of jobs. Third, the boundaries of an organisation can be described on the basis of membership, which in the type of organisations under consideration refers to the workers with whom an employment contract is concluded.

The definition of membership enables us to identify the employment relationship as the second subsystem of the social system 'organisation'. The employment relationship is composed of two dimensions: the employment contract and the employment regulation which is necessary to transform labour power into labour, or in other words, to materialise the promise of obedience. This is explained by the fact that, next to subjugation, the essential dimension of the employment contract is indeterminacy. Indeterminacy is settled on the basis of an agreement on an 'implicit zone of indifference' which means that the worker accepts that his or her behaviour is directed by the organisation under specific conditions. Employment regulation is necessary to secure efficiency and enforceability and to stabilise behavioural expectations in view of the organisation's objectives. Using this model of the organisation it has become possible to distinguish the two essential dimensions substantiating our analytical and conceptual model: the technical division of labour and the employment relationship.

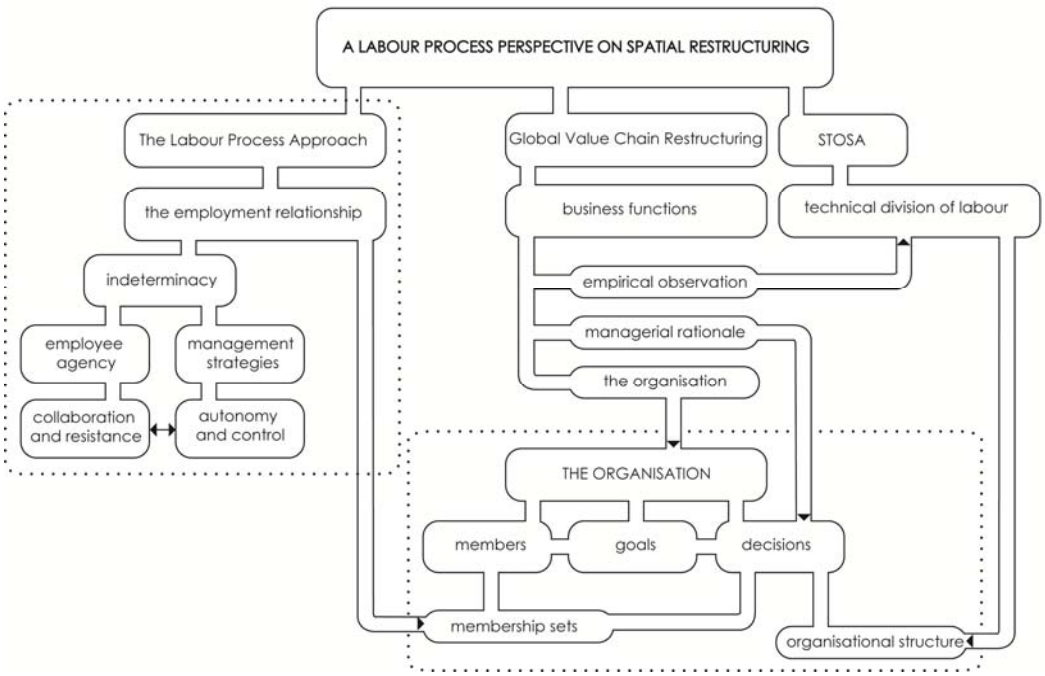
Defining the boundaries of the organisation based on the definition of who is or is not a member appears to be complicated by the presence of a wide variety of workers on the premises of a single firm. Here it was concluded that, while the primary and necessary criterion for membership is still the employment contract, it should be acknowledged that there are externally contracted workers on site or closely involved with the transformation process who are (at least partially) also subject to operational orders given by the local management and to prevailing functional coordination mechanisms. The trade contract that regulates their presence on site implies that part of the regulation of their employment is transferred to this client organisation. This is possible because defining membership does not require arranging all aspects of employment regulation at the level of the organisation with which the worker has concluded an employment contract.

In our fifth and final step in constructing our research framework, we set out from indeterminacy, as a core concept in the labour process approach, to address the agency of employees as the essential dimension of the employment relationship. In the labour process approach, the complex and contradictory nature of both managerial and employee agency in capitalism is central. On the one hand, coercive managerial strategies are not sufficient to resolve the structural contradiction between the forces of production and the relations of production because management seeks to obtain a stable working environment and stable employment relations in order to realise its objectives. As a result, managerial agency simul-

taneously includes strategies aimed at increasing control over workers and worker autonomy. Employee agency, however, which aims to fulfil both indirect and direct needs, is inherently rooted in conflicting interests, leading to equally complex and contradictory dynamics consisting of both collaboration and resistance, which may be formal and informal, individual and collective. This employee agency may range from explicit to implicit and from open to covert forms of resistance, which may turn out to be either positive or negative for the organisation. We therefore decided to focus on the micro level: the agency of the individual worker which comes into play in the concrete day-to-day execution of the work. This means not examining forms of collective action, whether formal or informal, that take place in response to spatial restructuring.

With the acknowledgement of the regulation dimension and both managerial strategies and employee agency as constituents of the employment relationship, the second subsystem of the organisation, it is possible to place the organisation in the analysis of spatial restructuring. This enables us to investigate how both management and workers play a part in the process and outcomes of this spatial restructuring. We have therefore addressed the two core concepts of our study, spatial restructuring and the employment relationship, and combined them in an integrated theoretical framework using the STOSA on the one hand and the labour process approach on the other. The logic followed in this chapter is summarised in the following diagram.

Figure 1.4 A labour process perspective on spatial restructuring



In the course of developing the theoretical framework, several questions were formulated that must be addressed in the empirical analysis of the study. These can now be summarised.

The first research question concerns the relationship between spatial restructuring and the technical division of labour and was specified as follows: (1) To what extent will spatial restructuring be related to changes in the levels of functional concentration, differentiation and task specialisation and fragmentation? (2) What is the impact of these changes on disturbances in the work flow as well as on their regulation? (3) What is the impact of these

changes on job quality? In addition, after the empirical analysis we may have obtained elements making it possible to assess the value of the business function concept for the investigation of spatial restructuring.

Our second aim is to include the strategies and agency of both management and workers in our analysis of spatial restructuring as a key dimension of the labour process. While the investigation of management strategies and agency essentially concerns the sequence of decisions made on the design, implementation and management of a spatial restructuring project, the agency of workers will be considered as it exists in day-to-day work. Forms of employee behaviour, whether collaboration or resistance, need to be analysed in close relation to concrete workplace structures, practices and managerial strategies and changes in all of these.

Now that the foundations of our research framework are in place, the themes opened up in this chapter will all continue to be relevant and will have a prominent place in the next chapter. In particular, the labour process approach provides crucial contributions towards understanding the role of knowledge in the labour process and changes in it. The conceptualisation of knowledge and its role in the labour process will also be explored in both theoretical and empirical ways in the second chapter.

2 | Knowledge and the labour process

Introduction

In economic theories, knowledge is now commonly perceived to be a critical factor in the 'raison d'être, definition, functioning and performance of firms' (Amin & Cohendet, 2004: 1). This central economic role of knowledge has gradually come to the fore since the evolution of advanced economies has been characterised as increasingly knowledge-based. During the last decade, moving towards the knowledge-based economy has become the cornerstone of government policies in the EU in the face of economic globalisation. The prime example of this is provided by the 2000 Lisbon goals, including the frequently cited headline that 'the European Union has set itself the strategic goal of becoming the most dynamic and competitive knowledge-based economy in the world' (European Communities (EC), 2004: 8). For decades, however, knowledge has been considered crucial for a service-based economy and for economic development (Drucker, 1993; Gibbons *et al.,* 1994; Stehr, 1994). Academic debates on knowledge and its significance for organisations have a long history in economics, management studies and sociology. Comprehensive theories on the emergence of the knowledge-based economy date from industrialism and post-industrialism with the seminal work of Bell (1973). These theories and the large number of scholars building on similar assumptions of post-industrialism, are mainly based on (variants of) the thesis that 'routinised (and particularly physically exhausting and/or repetitive) work is being replaced from year to year by new technology and work systems that require greater use of information, knowledge, greater discretion, smarter workers and symbolic analysts, all fueled by advanced education and training (...)' (Sawchuk, 2006: 595). The demand side drivers for these transformations are identified as ubiquitous technologies, increasingly varied, unpredictable and fast-changing consumer demands, growth in services and economic globalisation involving the relocation of unskilled work to distant locations.

The last argument in particular provided an inspiring starting point for this study. In the debates on globalisation and the knowledge society, the discourse seems to be shifting away from the mainstream idea about the massive movement of unskilled labour towards developing countries, leaving behind mainly knowledge-based work in the old economies, towards a more qualified view. The present view, which is often presented with some defeatism, is that knowledge-based work is also prone to offshoring and is consequently subject to worldwide competitive pressures, mainly targeting employment conditions (wages and social security benefits). At the same time, the idea of the knowledge-based society is itself being criticised more as studies demonstrate that there are also new niches for low-skilled work in the old economies, for example (but not exclusively) in the services sector (see for instance Thompson, Warhurst & Callaghan*,* 2001; Goos, Manning & Salomons*,* 2009; Fernandez-Macias, 2010; Thompson & Smith, 2010; Vandekerckhove, Capéau & Ramioul, 2010). Other authors emphasise that neither recent employment growth nor innovation are found exclusively, or even mainly, in the so-called high-tech industries, but on the contrary are situated in a wide range of traditional industries that are classified as 'low-tech' when benchmarked against the prevailing criteria on the knowledge economy (Hirsch-Kreinsen *et al.,* 2003).

Bearing in mind these general lines of argument, the question emerged concerning the extent to which the knowledge-intensity of activities plays a part in their relocation. Starting from the micro-sociological focus of this study, the research question was phrased as: What is the relationship between specific knowledge-related characteristics of activities and the design and implementation of their spatial restructuring? This question triggered a range of

considerations. What types of tasks require proximity and are difficult to relocate because of their specific knowledge characteristics? How does management take account of the knowledge needed for a production process when managing spatial restructuring? What will be the effects of the restructuring in terms of knowledge? How do workers react to all these changes? In order to formulate these questions more effectively, it is necessary to explore the significance of knowledge for the organisation and to link knowledge to our theoretical perspectives identified in the first chapter: the labour process and the employment relationship. Once again there is a wide range of both economic and sociological theories to consider.

In the next section we synthesise the ways in which mainstream economic and sociological theories conceptualise knowledge, how they distinguish codified from uncodified knowledge and how they explain knowledge codification as a key component of corporate strategies. The second section specifically focuses on the dimension of uncodified knowledge and its significance for spatial restructuring. In the third section we clarify employee agency with respect to knowledge utilisation in the labour process and assess a range of studies that address knowledge in spatially distributed workplaces. In the last section we draw conclusions on the importance of the insights discovered in this second chapter.

2.1 Selected theories about knowledge

The study of knowledge is included within comprehensive strands of theory and research in several disciplines. These include theories of the firm, such as evolutionary economics (where the key work was done by Nelson & Winter, 1982) theories on individual and organisational learning (first advanced in the work of Penrose, 1959), the literature on science and technology policy (Smith, 2002; Foray, 2004), theories on innovation (innovation systems, the geography of innovations, etc.) (Lissoni, 2001), theories on artificial intelligence (Dreyfus, Dreyfus & Athanassiou, 1986; Collins, 2007) and various strands in cognitive psychology and educational theory. We have restricted our attention to a number of theories that specifically consider knowledge in the organisation.

2.1.1 Codification in rationalist economic theory

In both micro- and macro-economics, knowledge is put forward as a key productive force and a key asset in advanced economies. The generation, dissemination and utilisation of knowledge is found to be essential in determining the innovative capability of firms and is conceived as a decisive determinant of their competitive advantage and, consequently, of economic growth and societal progress. Quite a significant proportion of academic debate concerns the epistemological and ontological definitions of knowledge. These debates are especially centred on knowledge codification, the scope and importance of uncodifiable knowledge and the conditions under which knowledge can or cannot, should or should not be codified in relation to innovation, the performance of firms and competitiveness. Codified knowledge is generally defined in straightforward terms as: 'structured data and the necessary instructions for its processing' (Johnson, Lorenz & Lundvall, 2002: 247) and it is characterised by the fact that it can be stored in hardware and transferred independently of individuals. In mainstream economic theories based on a rationalist paradigm, knowledge has long been regarded as akin to information and the production of knowledge was a question of reducing uncodified knowledge and turning it into information. Especially in earlier economic theories, firms are regarded as information-processing entities, with one of their prime objectives being to increase the stock of codified knowledge and to leave as little knowledge as possible uncodified (Amin & Cohendet, 2004: 254). Generally, the underlying assumption

behind these approaches is that the codification of knowledge is regarded as progress (Johnson, Lorenz & Lundvall, 2002: 255) because codified knowledge is more accessible and easier to disseminate. This is considered beneficial from the perspectives of science and technology policies (if codified knowledge becomes a public good) and global economic development, for instance to improve access to globalised markets for developing economies (*ibid.*: 255-256). On this basis, codification is considered to be a cornerstone of investment in science and technology programmes and R&D support. From a management perspective, knowledge codification is considered beneficial for firms because it contributes towards the reduction of transaction costs, permits 'modularisation', which can lead to specialisation, and facilitates knowledge externalisation, greater division of labour, outsourcing and modification of the spatial organisation (Cohendet & Steinmueller, 2000: 203; Malerba & Orsenigo, 2000: 292; Huws, 2011).

Economists consequently have a general interest in gaining a better understanding of the conditions under which potentially codifiable knowledge can be codified, of the limits of codification and of the extent to which it is necessary for economic performance (Cohendet & Steinmueller, 2000: 202-203). In view of this understanding, several scholars have developed complex taxonomies and theories of knowledge, its generation and dissemination and its role in relation to innovation and the performance and growth of firms and regions (for overviews see Ancori *et al.,* 2000; Amin & Cohendet, 2004). These taxonomies basically aim to define rules for the classification of knowledge according to its codifiability. Typically they differentiate between uncodified content, which is content that is not yet codified but may be codified in the future, on the one hand and strictly uncodifiable content on the other. Studies have further emphasised that the codification of knowledge is time and space dependent and that codification processes may be initiated at different levels, including nations, regions, industries and firms (Smith, 2002; Foray, 2004). From these perspectives, the codification of codifiable content is considered to be a matter of the time and resources that are invested at each of these levels. Major macro-economic drivers of codification are R&D investment, technological progress and the drive to make economic activities science-based. The codification debate also receives a boost from the continuing innovation, distribution and use of information and communication technologies which contribute towards new possibilities for the development of the so-called 'information flux', which is: 'the growing flow of information of all types that is available to organisations and individuals' (Cohendet & Steinmueller, 2000: 195).

Overall, the codification debate is considered to be relevant to a wide range of current economic questions, in relation to e-learning, patent regulations, R&D programmes, etc., but it is particularly linked to issues surrounding the circulation and transfer of scientific and technological knowledge between firms, the idea of science-based industries and the broader issue of innovation. Within these economic strands, strategies for the codification and classification of knowledge are identified as important forms of leverage to support these economic objectives. Overall, scholars adhering to these economic theories tend to argue that the conditions under which knowledge can be codified basically boil down to economic incentives and cost-benefit considerations (Cowan, David & Foray, 2000) and the expectations for codification are generally rather optimistic.

2.1.2 The meaning of uncodified knowledge for work and organisations

2.1.2.1 Constructivist and critical realist perspectives

A number of strands of theory from economics, management and learning science repudiate such a positivist view of knowledge and emphasise the role of uncodified knowledge in the organisation. Constructivist approaches such as those proposed, among others, by resource-based views of the firm, argue that knowledge cannot be understood independently of the individual or process through which it is obtained because: 'the knower cannot be separated from the known' (Ancori, Bureth & Cohendet, 2000: 263). This approach argues that humans generate knowledge and meaning from their experiences rather than passively absorbing new knowledge. Consequently, it is argued that more is to be expected from the uncodified bodies of knowledge, as intangible and non-transferable resources and capabilities, when considering organisational innovation and the competitive position of firms. This implies that knowledge and innovation management should aim not only to maximise codification but rather to stimulate the utilisation of uncodifiable knowledge for the benefit of the firm's objectives. From that perspective, the codification debate also strikes at the heart of organisational questions such as: what organisational structures favour knowledge mobilisation, how can the innovative capabilities of firms be enhanced, how can workers' implicit knowledge be harvested, how should learning be stimulated and how should knowledge circulate with different types of innovation in mind? Authors such as Nonaka (1994; Nonaka & Toyama, 2005) and Nielsen and Lundvall (2003) have demonstrated how organisational structures are decisive for facilitating organisational knowledge creation and innovation by articulating, appropriating or innovating the knowledge of workers. As was explained in Chapter 1, knowledge as a non-transferable asset is considered as an important driver of inter-firm collaboration and the establishment of inter-organisational networks. These networks generate access to knowledge that is regarded as a firm-specific capability. Nevertheless, these approaches still put forward codification as an intentional and functional strategy to foster efficiency in inter-organisational distributed work (Maenen, 2010: 164ff).

Scholars adopting a critical realist perspective are sceptical about both rationalist and constructivist paradigms. They emphasise the necessary distinction between the existence of an 'entity', like knowledge, and its observation or identification. The distinction is made between what is actual and observable, and what is real. Knowledge may 'exist' and be real without necessarily being articulated and observed (either by agents or by social scientists). It is defined as real because it has causal efficacy; this means that it has effects and generates observable events (Fleetwood, 2005: 199-200). Unarticulated (or uncodified) knowledge is therefore real because it has effects without necessarily being explicit. Through activity, for example at the workplace, knowledge is interpreted, applied and eventually adapted in order to become adequate. Using the terminology of the critical realists, knowledge at the workplace is necessarily conceptually mediated in the process of being used and applied. For knowledge to be reproduced or transformed, or to have effects on its environment, it still does not need to be articulated (*ibid.*: 215ff). Through their propositions, both the constructivist and critical realist perspectives bring the concept of tacit knowledge prominently to the fore.

2.1.2.2 The tacit dimension

Exposés on tacit knowledge typically start with the famous aphorism 'we know more than we can tell' which was used by Michael Polanyi when he introduced the concept (Polanyi,

1967).[14] Studies of tacit knowledge focus on how to understand the realm of tacit knowledge, where the boundary should be drawn between what is codifiable and what is uncodifiable and how this border may be shifted, for example through the use of ICTs. Today, the literature seems to have reached some consensus on the definition and characteristics of tacit knowledge. As summarised by Gertler (2003), tacit knowledge refers primarily to 'subsidiary awareness', which is based on the observation that successful performance depends on 'the observance of a set of rules which are not known to the person following them' (Polanyi, 1958: 49, cited in Gertler, 2003: 77). Should the performer focus his or her awareness on this tacit knowledge, the quality of the performance would drop (Ancori, Bureth & Cohendet, 2000: 272) as is typically illustrated with the act of swimming (not sinking), cycling (keeping one's balance) or driving a car (focusing on the traffic rather than on the various manoeuvres involved in changing gear).

The second and related aspect of tacitness refers to communication difficulties and the language inadequacies involved in expressing certain forms of knowledge (Gertler, 2003: 77). As a consequence of both characteristics, tacit knowledge can only be acquired through interaction with experienced tutors, learning by doing, imitation, trial and error and practical experience.[15] Unlike codified knowledge, tacit knowledge cannot be formalised and stored in impersonal forms, be generated by formal deduction or be acquired by formal study. Crucially, it cannot be utilised without the participation of the knowing subject (Hirsch-Kreinsen *et al.,* 2003: 27-28). On the contrary, it is necessarily exchanged and shared in interaction with other people. Furthermore, codified and tacit knowledge are interrelated and the boundary between the two types of knowledge can rarely be drawn neatly. All codified knowledge requires tacit knowledge in order to be useful. The production of codified knowledge implies the production of new forms of tacit knowledge in order to be used, and vice versa (Ancori, Bureth & Cohendet, 2000: 281). When mastering a language, for instance, it is not sufficient to know the words and the grammar; one also needs to develop linguistic feeling and social and cultural sensitivity to know what is considered as polite or rude in a given community. Mastering a language requires interaction with native speakers and is based on iterative combinations and reinforcement of both tacit (practice) and codified (grammar, vocabulary) knowledge. Human behaviour can thus in fact be understood as based on dynamic conjunctions of codified and tacit knowledge achieved by the individual in relationship with his or her environment. The consequence of this position is that human behaviour essentially implies learning.

The academic debates on tacitness and (un-)codifiability have implications for the economics of science and technology and innovation. At least, they lead to an acknowledgement that the efforts and the conditions under which knowledge can and will be codified are more complex and multifaceted than simply a matter of economic incentives, dedicated efforts or cost-benefit considerations. As a consequence, innovation cannot solely rely on R&D infrastructures or patents. In theories of innovation this insight has led *e.g.* to the development of Gibbons' 'mode 2' form of innovation, denoting the creation of knowledge in the context of applications, where it is context-driven, interdisciplinary and problem-centred (Gibbons *et al.,* 1994). It also contributes to the acknowledgement of innovative capabilities other than internal R&D resources, for instance in so-called Low- and Medium-tech industries, which may often be easily characterised in the public debate as less 'innovative'. Further, the importance of uncodified knowledge as a key asset for innovation at the firm level, and

14 Michael Polanyi (March 11, 1891 – February 22, 1976) was a Hungarian–British chemist and philosopher. He should not be confused with Karl Polanyi (October 25, 1886 - April 23, 1964) who was a Hungarian philosopher and political economist.

15 In their book 'Mind over machine' Dreyfus, Dreyfus and Athanssiou describe in detail how humans learn and evolve 'from novice to expert' by gradually incorporating knowledge and experience through practice, leading knowledge to shift from explicit to implicit (Dreyfus, Dreyfus and Athanassiou,1986).

hence for the competitive position of firms, is emphasised by resource-based views of the firm. This acknowledgement results in more ambiguous positions in the codification debate, so that limitless (public) investment in codification is no longer unconditionally considered to be feasible or beneficial (Ancori, Bureth & Cohendet, 2000; Malerba & Orsenigo, 2000; Johnson, Lorenz & Lundvall, 2002; Gertler, 2003). From this perspective, it is acknowledged that economic actors may not, by definition, be assumed to share their firm-specific knowledge with third parties.

More generally, these insights on the concept of tacitness have also led to an acceptance that codification cannot be a matter of substituting tacit knowledge and that it cannot be an easy undertaking. In their article with the inspiring title 'Why all this fuss about codified and tacit knowledge?' Johnson, Lorenz and Lundvall (2002) proclaim that, rather than speaking about substitution or complementarities of tacit and codified knowledge, every form of knowledge has a tacit dimension: 'it is exceptional for human or organisational competencies to be fully transformed into codes but, at the same time, it is always possible to transform aspects of them into codes' (Johnson, Lorenz & Lundvall, 2002: 253). The authors suggest that knowledge be divided into 'know what' (facts, information, data), 'know why' (algorithms, laws of nature, causalities), 'know how' (theoretical and practical abilities, skills) and 'know who' (personal networks and collaborative and communication abilities). The degree of codifiability of each type of knowledge differs. 'Know what' and 'know why' are in principle easier to codify. 'Know how' can be codified to a certain extent but since the acquisition of skills requires practice, codifiability inevitably remains limited (*ibid.*: 252ff). The codification of 'know how' also entails a risk of loss of knowledge during the transformation process. Furthermore, 'know who', including both personal networks and abilities in relation to social interaction with their members, is highly context-specific and often individualistic, which also sets limits on its codifiability.[16]

2.1.2.3 Critical reflections

Apart from the divergent epistemological and ontological views on knowledge and codification, it can be observed that the acknowledgement that conflicts of interest may exist in relation to both issues is generally absent from the above-mentioned economic and management theories. On the contrary, the underlying assumption seems to be that workers are in principle unconditionally prepared to share their knowledge with the management to promote the organisation's objectives. In theories emphasising the benefits of codification it seems to be accepted without question that workers' knowledge can be codified regardless of their opinion and collaboration. At least, the potential absence of their explicit consent is not identified as a possible hindrance to the codification process. In the previous chapter it was concluded that the agency of workers and their interaction with management are complex and often contradictory and although this may imply consent (as explained for instance by hegemonic power mechanisms), it cannot be assumed that collaboration in the codification of work-related knowledge should be taken for granted. This assumed implicit consent is all the more remarkable when it appears that the expected benefits of codification include knowledge externalisation, greater division of labour and outsourcing, all of which are defined as progress. It is legitimate to argue that not all actors in the organisation will necessarily share this view. Also the resource-based perspectives of the firm share the idea of harmonious employment relations when it comes to putting workers' knowledge at the disposal of the company. Generally, they do not look very closely at the complex and potentially conflict-

16 Here, too, ICTs may once again contribute towards further steps in codifiability as the rapid spread of virtual networks such as Facebook, Twitter and LinkedIn demonstrate. These can be identified as forms of codification of 'know who'.

generating contexts in which processes of codifying knowledge of the labour process are undertaken.

Authors writing on the labour process approach are critical about the presentation of workers' knowledge in organisations as something which is objectively accessible and also of the fact that workers are not addressed as knowing and acting subjects in the antagonistic context of the labour process (Sawchuk, 2006). Jackson (1994) for instance, criticises the treatment of knowledge and skills as 'stable objects which stand outside the performer'. This permits performance appraisals which are presumed to be unambiguous while it is precisely the separation of the knowing subject from the action and the denial of the learning aspect in this action that provides the possibility for control and authority (Jackson, 1994, cited in Sawchuk, 2006: 601ff).

Doorewaard and Benschop (2003) refer to the 'system-control thinking' as developed by Watson (2002) where: '(...) the organisation is seen as a system, which is controlled by qualified and rational managers, all of whom are neutral experts, capable of designing, engineering and driving the system to reach pre-established organisational goals.' (Doorewaard & Benschop, 2003: 275). The authors also criticize the proper concept of 'resources' in this theory as if: 'Human beings (...) are seen as sets of competencies, knowledge, skills and attitudes that are required to realize specific organisational outcomes' (*ibid.*). These organisational outcomes are sustainable competitive advantage and organisational change, and workers are assumed to make a unique contribution towards these if properly utilised. In contrast, the authors put forward the approach that: 'acknowledges the pluralistic, messy, ambiguous and inevitably conflict ridden nature of work organisations' (Watson, 2002: 375, cited in Doorewaard & Benschop, 2003: 273).

2.1.3 Knowledge in the labour process approach

2.1.3.1 Codification and commodification of labour

Marxist sociology of work theories emphasise the role of knowledge codification in capitalist economic expansion. The codification and appropriation of the knowledge and skills of workers is a strategy to cheapen and expand production under capitalism because it allows (a task) '... to be analysed and broken down into its component parts so that these can be turned into a set of instructions that can be replicated by less-skilled people or a machine' (Huws, 2006: 7). Codification enables the standardisation of tasks, making it possible to move on to a next phase in the technical division of labour as well as quantifying, measuring, and thus commodifying the output of work (*ibid.*) Gertler defines this as the problem of 'how to find and appropriate tacit knowledge' and denotes it as the original knowledge problem, as old as capitalism itself: '[the problem of] ... bridging the gap between conception and execution and building recursive loops to allow tacit knowledge acquired during execution by shop floor workers to feed back to conception by engineers, designers and managers' (Gertler, 2003: 82). As mentioned in Chapter 1, the ongoing technical division of labour based on knowledge codification and on the standardisation of work also contributes to the growing specialisation of firms and sectors and the acceleration in the globalisation of the economy. These developments are necessary in order to allow capital to expand further.

Recent research in the labour process approach highlights the fact that not only codified and standardised work is commodified. On the contrary, human activities based on knowledge which is to a large extent tacit, are also subjected to managerial control in order to achieve capitalist objectives (Thompson & Smith, 2010: 12). In particular, research on interactive services has generated a growing interest in types of work that can be characterised as

strongly context-related and involve an important individual, tacit dimension, such as creative, aesthetic and emotional work. Research into interactive service work demonstrates how emotional and aesthetic work has been transformed from basic human qualities allowing day-to-day social interaction into actual 'work' (Junor & Hampson, 2008: 4). Grugulis, Warhurst and Keep (2004) proclaim that: 'in emotional and aesthetic labour, employees' feelings and appearance are turned into commodities' (*ibid.*: 8). These insights demonstrate that codification of work and knowledge is not necessary a precondition for its commodification but that uncodified knowledge and even the 'whole person' is also commodified (Thompson & Smith, 2010: 17). With the growing importance of the service economy, character traits, attitudes and social predispositions are increasingly defined as 'generic' skills (*ibid.*: 16). Authors critical of the debate on the knowledge economy thus emphasise the shifts in how skills are defined and valued.

Economists such as Ancori, Bureth and Cohendet (2000) are among those who point out that codification makes it easier to commodify knowledge but that it should not be simply identified with commodification. Commodification of non-codified knowledge is also possible, and there are numerous examples of commodified activities that rely predominantly on tacit knowledge. This is particularly the case in service activities where production and consumption occur simultaneously: after-sales services, driving schools, consultancy, etc. On the other hand, as the authors proclaim, not all codified knowledge is necessarily commodified because not all codified knowledge is necessarily valuable to the market (*ibid.*: 258).

2.1.3.2 The discovery of the knowledge worker

The issues of knowledge-based work and knowledge-based workers have generated a broad strand of literature and research aimed at characterising this type of work, investigating the extent to which the work done by knowledge workers is fundamentally different and the extent to which the emergence of knowledge-based work will lead to fundamental shifts in the power relationships between capital and labour and in society as a whole (Frenkel *et al.,* 1999; Thompson, Warhurst & Callaghan*,* 2001; Darr & Warhurst, 2008). This explicit focus on knowledge-based workers is inspired by the growth in knowledge-intensive jobs, such as the emergence of a large workforce in IT and IT-enabled business services, which is supported by empirical evidence (Fernandez-Macias, 2010).

Scholars on the labour process approach remain critical about the assumption of a fundamental change in employment relations as a result of this evolution. Darr and Warhurst observe that as the tacit and inalienable knowledge of (certain categories of) workers were recognised as critical to the firm's competitiveness, the economic and management literature began to tackle the issue of the management of these knowledge workers. This literature proclaimed that, due to their autonomy and the fact that they even 'own the means of production' (Drucker, 1993: 18, cited in Darr & Warhurst 2008: 32), a specific management approach is apparently required to capitalise on these workers' knowledge. The central focus of such knowledge management concerns the human resource management of knowledge workers: 'for companies to succeed in the knowledge economy, the task for the management is to create, capture and capitalize on workers' knowledge' (*ibid.*). Authors on the labour process approach are sceptical about the subsequent paradigm shifts from 'post-fordism' to 'new economy' and then to 'knowledge economy' and also about the assumed positive outcomes for workers. They generally question the optimistic message about the move from command and control towards collaborative, high-trust, high-commitment employment relationships (Thompson & Smith, 2010: 15).

Nevertheless, several studies point to the fact that knowledge-intensive work does indeed seem to result in specific management strategies, where in particular trust plays a key role

(Adler, 2001; Adler, Kwon & Heckscher, 2008). Huws addresses the role of creative and knowledge workers in capitalist development and emphasises the contradictory relationships and interactions between management and workers in this type of work (Huws, 2011). She argues that the experiences of knowledge and creative workers: '(...) exhibit in a particular acute form a range of contradictions which in more routine occupations lie further below the surface' (*ibid.*: 512). Creative work is crucial for the economic development of organisations because creativity forms the basis for a range of innovations and activities. Since management needs to manage the creative workforce but at the same time to secure control over intellectual property, a complex balance between autonomy and control has to be achieved. Creative workers, in turn, are attracted to this type of work because of the self-realisation that it offers them. The labour of creative workers is characterised by a high commitment to the work itself and they exhibit a strong identification with the product of their labour. As such, creativity is experienced as unalienated and 'owned' by the workers (Huws, 2011: 511ff). On the other hand, the employees still have to sell their labour. As a result of these complex dialectics, different forms of managerial control need to be developed and each of these gives rise to different forms of worker resistance (*ibid.*: 519). Overall, creative work is also subject to the general trend towards increasing codification and commodification.

These observations point towards the fundamental discretion of the (creative) worker over his or her labour which is the basis of indeterminacy in the employment relationship. This is linked to the dialectics of autonomy and control as set out in Chapter 1. From this perspective, knowledge is considered an essential foundation of the employment relationship.

2.1.3.3 Knowledge and the employment relationship: use value and exchange value

In Chapter 1, it was explained that the premises of managerial control and employee agency are rooted in the fundamentally contradictory dynamics between use-value production and exchange-value production. Reviewing these basic concepts provides inspiration when it comes to considering the role of workers' knowledge in the labour process. The production of use-value refers to the basic need of humans to create, 'play' and produce, and to learn by doing so. Use-value is created both within and beyond labour processes because it is fundamental to all human activity. Exchange-value is produced when use-value is commodified within capitalist production relationships. As capitalist economies expand, use-value is increasingly organised according to the principle of exchange-value production.

In view of the fact that both tacit and codified knowledge are generated whenever people engage in activity, the use-value thesis highlights the fact that every labour process implies learning (Sawchuk 2006: 611). Tacit knowledge, defined earlier as subsidiary awareness, as knowledge that cannot be simply transferred by formal language and is in constant interaction with codified knowledge, emerges as a result of this basic human need to produce use-value, even in the context of its potential commodification in production relationships based on exchange-value. From this perspective, the utilisation of knowledge in work is directly linked to indeterminacy. Sawchuk recalls the importance of the use-value thesis for work/skill analysis and argues that: '(...) its fundamental contradiction with exchange-value anticipates varying degrees of cooperation and conflict, engagement and alienation, upskilling and deskilling, which necessarily and simultaneously co-exist within the same environment' (*ibid.*: 604). The author further emphasises that: 'Activity, skill and knowledge embedded in use-value production account for the pragmatic and generally co-operative orientation by both workers and management towards the intrinsic, practical usefulness of the service or the product' (*ibid.*: 604). Use-value is reflected in the fact that workers take pride in their work even if it has to be done under precarious conditions and is regarded as of low quality

when measured against prevailing job quality indicators (Pauwels, Ramioul & Van Peteghem, 2012).

This conclusion assigns a key role to knowledge in the employment relationship. When tacit knowledge and the creation of use-value are acknowledged in the labour process, workers come to be seen as acting and knowing subjects.

2.1.4 Summary

A number of theories explored in this first section address the importance of the inalienable, social, context-related dimension of tacit knowledge and the fact that this cannot be ignored in the organisation. In the economic and management literature, the limits of codification have gradually come to be recognised and the acknowledgement of uncodified knowledge is identified as crucial for the firm's innovative capabilities and its competitive position. A major argument put forward by the labour process approach on the role of knowledge in organisations is that the discovery by the management and mainstream economists of the importance of uncodified knowledge, which remains in workers' possession, does not fundamentally alter the key drivers and strategies of management under capitalism. These aim to control and commodify labour, expand its activities and create profit.

While the importance of uncodified knowledge may be broadly shared, the paradigms and fundamental principles behind the approaches explored in this section obviously differ considerably. One key difference is that the assumptions underlying most economic and management theories generally do not set out from the existence of fundamental conflicts of interest between management and workers in relation to knowledge or they do not address these explicitly. In the labour process approach, in which structured antagonism is given its own place, it is acknowledged that the worker's agency does not necessarily serve the organisation's objectives and the basic assumption is that labour processes are contingent upon the dynamic power relationships between management and workers. Viewed from this perspective, power relationships play a key role in strategies intended to codify workers' knowledge, in the limits that management encounters in these codification processes and in the alternative strategies that have to be developed in response to these. These management strategies may be expanded in order to commodify uncodifiable knowledge (for example in emotional or creative labour) and control strategies may be complemented by strategies to appropriate the innovative and flexible capacities of human labour through alternative formal or informal management practices.

As argued in Chapter 1, the agency of workers, in all its diversity, also has a central role in the labour process. This agency is rooted in their ultimate discretion over their work and over inalienable dimensions of knowledge which are fundamental to human activity. The basic human need to create use-value, which comes into conflict with the appropriation of the surplus value, generates a fundamental contradiction between the forces of production and the relations of production, which has to be managed in a variety of ways and which generates a variety of interactions between labour and capital. The following citation provides a concise conclusion: 'The special, indeterminate status of labour power as human, embodied, mobile and active ensure common imperatives of control are tried, but also that any settlement between labour and capital is temporary and diverse' (Thompson, 2010: 15). While this conflict and how it is managed may be more apparent and acute in the case of knowledge and creative workers, it is fundamental to the very nature of the employment relationship.

2.2 The map and the territory

From the overview of theories and approaches on the role of knowledge in the organisation, the tacit dimension of knowledge comes to the fore as of particular relevance when investigating spatial restructuring. On the one hand, it is possible, and indeed is common practice, to transform large bodies of knowledge into codified information, even though this may be easier for certain types of knowledge (know what, know why) than for other types (know how and know who). Codification undoubtedly has benefits when it comes to knowledge sharing (Maenen, 2010: 286-287). Consequently, this knowledge is, in principle, less spatially bound, which is not to say that transferring it is necessarily an easy undertaking or that it does not require specific effort, such as investment in local skills. On the other hand, it is equally undeniable that some aspects of knowledge are uncodified in a specific period and context and still others will always remain uncodifiable. The tacit dimension of knowledge implies that certain aspects of knowledge are embodied in individuals and can only be utilised, generated and circulated through social interaction in a given social context. Consequently these aspects of knowledge are highly person- and location-specific and are at risk of being lost through relocation.

These insights make it possible to specify the key questions for this study: What is the relationship between the specific knowledge characteristics of activities and the design, implementation and outcome of their spatial restructuring? How will management take account of those types of knowledge when setting up spatial restructuring projects and take into account the risks of a possible loss of knowledge? What management interventions in relation to the management of knowledge are deployed when designing and implementing spatial restructuring projects and how can these interventions be explained? What knowledge utilisation practices are used by workers in the restructuring context and how can these be explained? In order to address these questions empirically, the next task is to identify knowledge-related task characteristics that may facilitate or hinder relocation. These questions invite us to explore the variety of knowledge characteristics of activities that may influence their potential to be relocated. A number of recent studies have focused on this question.

Before exploring these, however, we will clarify how employee agency is addressed in this empirical investigation. We approach knowledge as a central dimension of the indeterminacy of the employment contract. This makes it subject to the dynamics of the labour process and highlights the agency of workers. At the same time, 'knowledge' is difficult to grasp conceptually and to observe empirically. Since the tacit dimension is described as a kind of subsidiary awareness which is difficult to formalise and store and inseparable from the subject, human knowledge is, by definition, a highly dynamic reality which is difficult to 'unpack' into observable codified and uncodified parts. Although knowledge is dynamic, however, it is nevertheless real because it has effects on which we can focus our observation. These effects are visible in the actual work done in practice. The approach is therefore to focus the investigation on the day-to-day working environment in which workers utilise their knowledge as knowing and acting subjects in the social context of the labour process. The specificities of knowledge, and its effects, come to the fore particularly clearly in two types of workplace behaviour: contextualisation and improvisation.

2.2.1 Knowledge and employee agency in the labour process

In Chapter 1 it was argued that the processes and outcomes of spatial restructuring are influenced by the strategies and agency of management in interaction with the workers. It was explained that from the labour process perspective, management strategies can be analysed as complex and often contradictory, simultaneously implying control of the workers and

worker autonomy. In practice, control and autonomy will be shaped by organisational decisions on the structure of the technical division of labour and the control structure governing the transformation process, and by decisions concerning the regulation of employment, including various strategies in relation to human resources policies and practices. These strategies will collectively define the conditions for employee agency. Workers may express this agency by behaving in accordance with the organisation's expectations, which means doing their work as instructed and expected by the management, and making use of their (tacit) skills to do this. Conversely, they may also exhibit various forms of resistance or craft their job in order to suit their own needs and serve their own interests. Contextualisation and improvisation as expressions of the individual worker's agency in the actual work done may resolve the indeterminacy of the employment contract in either of these ways.

2.2.1.1 Tacit knowledge and contextualisation

2.2.1.1.1 Polymorphic actions and practical knowledge

We defined human behaviour above as based on dynamic conjunctions of the individual's codified and tacit knowledge in relation to his or her environment. Based on this conceptualisation of knowledge, we define contextualisation as the process of combining tacit and codified knowledge whereby uncodified information from the immediate environment is actively obtained, used and applied to perform a task. Collins' action categories, drawing on the distinction between tacit and codified knowledge, are helpful in order to understand contextualisation (Collins, 2007). The author labels actions based on the carrying out of formal instructions as 'mimeomorphic' because they can, at least in principle, be repeated in the same way on any occasion. These actions can be formalised in instructions (Ribeiro & Collins, 2007) and they are basically context-neutral. Polymorphic actions, in contrast, rely on combinations of many different behaviours depending on a specific context. For example the act of 'greeting' is never exactly identical but, on the contrary, is necessarily performed in a specific social context and in interaction with others. If the act of greeting were based on a fixed set of movements always repeated in the same way, it would lose its sense and purpose (*ibid.*). Reference can also be made to Bourdieu's differentiation between the *modus operandi* and the *modus operatum* and the importance of the context for the former (Bourdieu, 1993 cited in Brown & Duguid, 1991: 41). The modus operandi looks at the process of a task as it unfolds, influenced by the changing conditions in the environment; the modus operatum refers to the finished task as such. This distinction between modus operandi and modus operatum underlines the importance of finding adequate responses to a variety of situational, contextualised requirements for successful performance. The link to the distinction between codified and tacit knowledge, and their dynamic conjunction, is easily made.

This difference between modus operatum and modus operandum resonates with the other literature. Hirsch-Kreinsen (2006) uses the concept of 'practical knowledge' when he emphasises the importance of tacit knowledge in day-to-day work and innovative practices that can be observed in all work processes, regardless of the skill level of the workers or the knowledge-intensity or complexity of the tasks: 'On that score, particularly the never completely anticipatable conditions under which the products and technical systems are developed and used must be taken into account: the complexity and contingency of the material, social and economic factors of the usage situation and the imponderabilities of possibly intricate technical systems. Often experience, even sure instinct, seldom - or only with great effort - explicable, are essential for their use.' (*ibid.*: 7ff). The author regards such practical knowledge as an important basis for different types of innovation: 'Unlike scientific knowledge that orients itself on criteria such as theoretical relevance and universality, validity criteria such as practi-

cability, functionality, efficiency and failure-free use play a decisive role for practical knowledge. It is generated in work process-related contexts and its probation rules are determined by the respective application and utilisation context.' (*ibid.*). An example is the requirement to adapt tools and equipment (for instance new software, a new tool or a new machine) in order to be able to use them in the concrete production process.

2.2.1.1.2 Common ground in collaboration and the customer as context

Other authors emphasise the importance of collaboration for establishing contextualisation. This theme has become more prominent since remote collaboration is increasingly prevalent due to the use of ICTs and the processes of economic globalisation. In her study on geographically dispersed teams, Cramton (2001) identifies several problems in such teams, stemming from the fact that the establishment and maintenance of 'mutual knowledge' is hampered. In the literature on communication, mutual knowledge is defined as knowledge that the communicating parties not only share in common but know that they share it, referred to as 'common ground': 'Indeed, the usage "common ground" suggests how deeply engrained physical co-presence and shared physical setting may be to establishing shared understanding and affiliation' (*ibid.*: 346). One key problem arising in remote collaboration is, according to the author, the failure to communicate and retain contextual information. An important reason for the failure to build up mutual knowledge is the elimination of non-verbal and brief verbal cues (such as nodding), which have important signalling and corrective functions in face-to-face communication, and the omission of the 'decoding and interpreting' function (*ibid.*: 362). These refer to Collin's polymorphic action category and to contextualisation. In Cramton's study, telemediated communication seems in particular to contribute towards exacerbating the communication problems that can also occur in collocated teams.

Particular concerns about the importance of collaboration for contextualising knowledge are raised by studies on geographically distributed software development. In his study on remote software development projects, Mirani (2007) emphasises the importance of intergroup interactions, informal links, liaison, information exchange, etc. in bridging the gaps in contextual and application-specific knowledge between dispersed teams (*ibid.*: 228). Such integrative mechanisms, 'micro-coordination' or 'organic' structures are important to foster mutual learning and to secure effectiveness and performance, especially in situations where there is high task complexity and interdependency. Mirani demonstrates that it is necessary for integrative mechanisms to complement the codification processes that are equally necessary and typically precede offshoring of complex, highly interdependent tasks. This confirms the necessary and complementary character of codified and tacit knowledge through contextualisation.

Holtgrewe (2008) also observes the dialectic between codified and tacit knowledge in the context of the outsourcing and relocation of knowledge-intensive work in the IT sector (*ibid.*: 13ff). She states that codification cannot be regarded as a linear process but is a recursive loop (*ibid.*: 2ff). She also demonstrates that codified knowledge paradoxically requires greater contextualisation efforts to apply it successfully: 'Codification of knowledge does not substitute contextual or tacit knowledge but apparently *increases* the demands and pressures on employees' capacity for sense making and re-contextualisation (...)' (*ibid.*: 13ff, italics added).

Finally, a particular type of contextualisation, where the central focus is on interaction with others, applies to service work requiring interaction with clients, customers, patients, etc. Work consisting of interaction with others inevitably requires contextualisation which is most prominent because the conditions under which these tasks can be performed can never be fully anticipated. In this respect, Thompson, Warhurst and Callaghan (2001) conclude from their analysis of interactive service work that these labour processes instead draw on:

'(...) capacities and attributes located (often unconsciously) within each worker. These workers draw on limited technical knowledge during their work, but they do have to develop a consciousness of their social skills and an awareness of how and when to deploy these' (*ibid.*: 937). The authors denote these as tacit skills. In the third section of this chapter, we will describe in more detail the specific characteristics of interactive service work and their relevance for spatial restructuring.

2.2.1.1.3 Formalised or tolerated contextualisation

Overall, while it clearly relies on tacit knowledge, contextualisation may be part of a job description, for instance in service work or in work organisations that intentionally create ample opportunities for social interaction and knowledge sharing between employees, for example in teamwork settings. In such cases, contextualisation is a part of the job and is expected, stimulated and valued as such. This acknowledgement of the importance of contextualisation and of the socially interactive dimension for the generation, utilisation and exchange of knowledge is reflected in a broad strand of academic literature on participative job design, high involvement workplaces and, in particular, theories on organisational learning (Argyris & Schön, 1978; Fiol & Lyles, 1985). Such formalisation does not, however, always take place. Thompson, Warhurst and Callaghan (2001) observe that the capacities and forms of contextualisation involved, and the skills they require, as identified in interactive types of service work, are not necessarily recognised and are not by definition valued by management. The skills needed for service work which involve emotional aspects (as in some types of call centre work, for example in health services or debt collection), aesthetic aspects where the right 'appearance' is the main criterion (for instance when working on a reception desk or in retail) or creative work (for instance in media industries) are often understood by management as personal traits rather than skills.

Other authors also conclude that the unrecognised knowledge required to solve unanticipated problems, which workers bring into play to make the process run smoothly, is often addressed by management in ambiguous ways (Flecker *et al.,* 2008: 94ff). The authors argue that, on the one hand, standardisation (based on codification) is often, by definition, intended to eliminate the unpredictable aspects of work. On the other hand, the need for contextualisation can never completely be ruled out and a new need for contextualisation is generated when labour processes are reshaped: 'Standardisation and new demands on tacit knowledge are interrelated and put on workers (and their ad hoc functional flexibility and tacit skills) an additional demand in both innovative business functions and the less-than knowledge-intensive areas. Especially there, in the face of Taylorist standardisation, the remaining and increased demands on knowledge tend to be invisible and underrated, specifically when newly imposed routines get in the way of competent work performance.' (*ibid.*).

2.2.1.2 Improvisation

2.2.1.2.1 The necessity of improvisation

The fact that contextualisation may not be formally rewarded, encouraged or recognised but is nevertheless applied by workers, points towards the issue of informal work practices and improvisation. Informal work practices based on uncodified knowledge are given a prominent position by authors following the community of practices approach, which refers to the work of Lave and Wenger (1990) and Brown and Duguid (1991). These authors emphasise that work necessarily draws on the combination of formal descriptions and informal work practices when they demonstrate how 'formal work descriptions and abstract knowledge

omit the "details" that are however necessary to make the formal descriptions work in practice' (*ibid.*: 40). Brown and Duguid define the role of noncanonical practice (such as workarounds), in contrast to canonical descriptions, as crucial even to the extent that it is decisive for the success or failure of organisations. Improvisation, rather than the descriptions and documentation prescribed by management (*i.e.* in codified knowledge) often forms the basis for adequate task performance. These authors also emphasise that such improvisational practice is often viewed by management as deviant behaviour.

The authors take this a step further by showing that inadequacies of the firm's directives actually make work more difficult to accomplish and thus require more, not fewer, improvisational skills. As a result: 'An ostensible downskilling and actual upskilling therefore proceed simultaneously' (*ibid.*: 42ff). The relevance of informal work, according to these authors, is the acknowledgement that working and learning are necessarily inseparable. Both have not only an individual but also a collective dimension due to the need for collaboration to solve the problems encountered during work and because of mutual learning through interaction. These insights lead to the authors' concept of communities of practice, which has become a major reference concept in the literature on organisational learning and organisational innovation.

2.2.1.2.2 Improvisation from a labour process and an organisational perspective

Authors adopting the labour process approach emphasise the existence of informal work in all labour processes, either as a form of collaboration or as resistance. It is rooted in use-value creation because: 'Apparently unskilled, routinised work can frequently obscure enormous evidence of play, hidden "tricks-of-the-trade" and subversion' (Sawchuk, 2006: 603). In this respect, Thompson, Warhurst and Callaghan (2001) demonstrate that the interest among managers in uncodified knowledge in general and informal work practices in particular is not a post-industrial phenomenon but an integral part of industrialist capitalism (*ibid.*: 928). They recall the historical account of managers' awareness of uncodified knowledge when they bring into the picture how during the history of Taylorism informal shop floor practices were implicitly tolerated by management as forms of innovation which were actually necessary to secure a more effective work performance than the formal prescriptions could (*ibid.*). The authors conclude that the knowledgeable worker was 'left into the shadow', until new management practices, such as high performance workplaces, brought the importance of shop floor knowledge to the fore and now: 'management is keen to introduce organisational structures and practices which facilitate initiative and innovation in the form of creativity and continuous improvement on the part of the workers' (Thompson, Warhurst & Callaghan, 2001: 929).

From the point of view of the definition of the organisation as set out in the first chapter, the distinction between formal and informal is not relevant. From this organisational perspective, the employment relationship, as the second subsystem of the organisation as a social system, is necessary because of its function to stabilise behavioural expectations. This implies that members of an organisation are expected to act and behave in ways that are meaningful for the organisation. Whether this is formal or informal is irrelevant (informal can be meaningful too) and this is in fact impossible to establish in advance. Within the 'implicit zone of indifference' that is settled in the employment relationship, the worker accepts as a member that his or her behaviour is directed by the organisation under specific conditions. Formal instructions from the management will generally be incomplete and insufficiently specified. 'How' incomplete and unspecified depends on a number of organisational decisions. These concern the structure of the technical division of labour, the contractual and spatial allocation of work and the other dimensions shaping the employment

relationship. These will collectively define the level of control over workers or their autonomy. If workers are granted sufficient autonomy and support, they will have opportunities to contextualise and adapt the prescribed work to the actual needs by means of improvisational practices. Conversely, if control strategies dominate, this will be more difficult, although no less necessary. According to some of the authors just cited, more contextualisation and improvisation may even be required in cases where work is strictly prescribed and highly controlled. Consequently there will be improvisation on the work floor in both situations, as a practice whereby orders are interpreted and adapted to compensate for the 'omitted details'. From this organisational perspective, the term improvisation is better suited to describe these day-to-day work practices as a form of employee agency, rather than the term 'informal'. Improvisation, which is situated within the grey zone of indeterminacy, may indeed be a form of behaviour that is functional in terms of meeting the organisation's expectations. This possibility, which applies in principle to improvisation in particular and to employee agency in general may also encompass behaviour that is deviant from the organisation's expectations, as demonstrated by the list of forms of resistance by workers discussed in the first chapter. Improvisation may therefore serve the worker's interest rather than the organisational objectives and may involve deviations from orders.

2.2.1.2.3 Improvisation and codification

One illustration of the dynamic relationship between codification and the emergence of improvisational work practices is provided in the study on cross-border software development by Maenen (2010). The author first describes how codification of software development projects is boosted by a range of management manuals which describe in detail how the various steps, goals and resources involved in project development should be designed and implemented (*ibid.*: 180). These manuals aim to anticipate and minimise the range of possible problems that can apparently rise in such complex collaborative projects. Various forms of 'slippage' do, however, occur between these descriptions and practical implementation and these result in a range of responses, both by management and by team members. These responses may move further along the path towards codification, for instance with 'recalibration', which is a type of 'en route' (re)codification of the project based on contextualisation (*i.e.* taking account of the concrete circumstances of the project development). Conversely, they may also involve various forms of informal shortcuts and adaptations, denoted by Maenen as 'decoupling' or 'bricolaging' in order to find solutions to make the systems work. These work practices are possible because operational staff are well acquainted (in any case better than their bosses) with the tools used to solve complex technical problems and run development projects. These practices involve team members transgressing formal hierarchical, functional or even inter-organisational boundaries of the development project and possibly setting up their own adjusted, informal system to coordinate the remote collaboration (*ibid.*: 220).

It is important to emphasise here that improvisation is not necessarily undocumented and is therefore not by definition limited to uncodified knowledge. Employees may keep personal notes with hints and tips or may otherwise unofficially document their working practice in order to facilitate the execution of their tasks. These may nevertheless be unknown to the management and may therefore remain uncodified for the organisation.

2.2.1.3 Summary

It may not be easy to distinguish between contextualisation and improvisation when observing how a concrete task unfolds, since both types of knowledge utilisation are essential to secure a normal, seamless work flow. Nevertheless, they are two different knowledge utilisa-

tion processes. Contextualisation is the way by which codified knowledge and tacit knowledge, defined as subsidiary awareness, are combined and applied in the process of concrete execution of a task by obtaining additional information from the environment. This environment may encompass the way technical infrastructures operate or variations in materials and may also include colleagues (when working in teams) or the customers and clients to whom a service is provided. The worker's tacit knowledge is the essential feature of contextualisation. It has already been emphasised that contextualisation may constitute the very core of a job and may be formally acknowledged and valued in the employment relationship. Improvisation concerns the practical application and adaptation of orders and prescriptions because these are, as a rule, incomplete and insufficiently detailed. Improvisation is specifically important in order to deal with all kinds of unanticipated and unavoidable disturbances. Improvisation is, in contrast to contextualisation, not necessarily tacit for the worker. Viewed from the company's perspective, however, this type of worker agency falls by definition outside the scope of the formalised prescriptions and therefore often remains uncodified for the management. What is codified and uncodified is context-specific and relative rather than absolute. In an organisational context it is important to distinguish between codified, uncodified in the sense of undocumented and 'informal', and tacit, in the sense of uncodifiable subsidiary awareness which is implicit even for the user. This acknowledges that uncodified knowledge may encompasses the entire realm of knowledge not explicitly documented in a certain social context, including both what is tacit and what is known to the user but unknown to the management.

Based on these definitions it is also clear that contextualisation and improvisation are not specifically reserved for complex work. Both in knowledge-based work and in work that is considered not to be knowledge-intensive there is a realm of uncodified knowledge which is required to carry out the tasks as needed and expected.

Contextualisation and improvisation can both be regarded as emanations of the way in which the worker applies knowledge to his work, which is why they are important categories of actions for the purposes of this study. They demonstrate the limitations of codification in general and the limitations of codification for a seamless work flow in particular. It is notable that a number of authors have observed how codification actually brings about *new* needs for contextualisation and for improvisation. The relevance of both processes relates to their importance for undisturbed production processes. In this respect, the management may have an ambiguous position towards these types of knowledge utilisation by workers. While the application of uncodified knowledge is not, by definition, recognised (as a skill) or formally valued and encouraged, it is possible that management is well aware of its potential and perhaps even of its indispensability for the organisation's performance. It does, however, represent a type of employee behaviour that can be used against the organisation.

To conclude, we can refer to the analogy advanced by Bourdieu, who distinguishes between the journey as seen on the map and the journey as it is undertaken on the ground, where we have to take account of traffic jams, road works, fatigue, mistakes in directions, etc. However useful, the map is nothing more than: 'an abstract space, devoid of any landmarks or any privileged centre' (Brown & Duguid, 1991: 2). While the map is required to start the journey, by itself it provides little insight into the ad-hoc ways in which changing conditions can be resolved. Starting from this reference point, we conclude that codified knowledge can only provide a temporary solution and starting point and that it is not sufficient to accomplish the work and to arrive at the finish. The map, in other words, is not the territory.

2.3 The search for relocation criteria

After concluding that uncodified knowledge and day-to-day agency of workers are so profoundly important, one might wonder whether the relocation of work can be possible at all. Indeed: 'tacit knowledge does not travel easily' (Gertler, 2003: 84). The history of economic development and of organisational structures, however, in which a constantly increasing inter-organisational and spatial division of labour are fundamental trends, proves the opposite. Our first key question of this chapter as to the relationship between the specific knowledge characteristics of activities and the design, implementation and outcome of their spatial restructuring, remains essential. The central focus of this section is the search for knowledge characteristics that may influence spatial restructuring. This process of exploration represents a key step in the empirical design of our study.

We turn to a selection of studies to find indicators of ways in which specific types of knowledge influence spatial restructuring. As demonstrated in the first chapter, the literature on offshoring and outsourcing is vast and it has received a particularly important boost from recent technological developments that have enabled knowledge work to be easily distributed across the globe too. It seems that customer relations work, of the type provided by call centres, and IT activities such as software development, are emblematic of the types of activities that are increasingly being offshored. This development has given rise to a large number of empirical studies, both quantitative and qualitative, which aim to estimate the prevalence of relocation and its outcomes in relation to a range of organisational issues. While it is not possible to give an exhaustive account and analysis of this extensive empirical field, we have made a selection of studies that identify characteristics that make jobs prone to relocation or, on the contrary, limit their restructuring over distance. To achieve this, a range of quantitative studies have developed indicator sets to measure and forecast outsourcing and offshoring, while others have focused in greater depth on the knowledge-related specificities of certain activities. Some of these studies also include overviews of management strategies used to bridge time and distance in geographically distributed work.

First we will assess some quantitative studies that construct lists of characteristics in order to forecast offshoreability, specifically for service occupations. These studies seek to define exhaustive and generic criteria in order to produce aggregated statistics. Secondly we will look more closely at some qualitative research concerned with acquiring in-depth insights into the spatial distribution of particular types of jobs. Here we focus on customer services work and complex, knowledge-intensive work. Particularly in the latter area, the research also addresses the ways in which the generation, utilisation and circulation of knowledge is managed when work is geographically dispersed.

2.3.1 Measuring offshoring and outsourcing

2.3.1.1 Forecasting offshoreability

In the wake of a growing policy interest in globalisation, a number of attempts have been made to quantify the outsourcing and offshoring of activities and to map international employment shifts related to global trade. This research received an additional boost when it became clear that not only manufacturing work is being massively relocated to developing countries, but that business services are also being moved more easily. Unlike the internationalisation of manufacturing, which can be estimated by using, for instance, trade statistics for intermediary goods and input-output tables, international trade in services is much more difficult to map. Kletzer and Jensen (2006), van Welsum and Vickery (2005), van Welsum and Reif (2006), Blinder (2007a & 2007b) and Goos, Manning and Salomons (2009)

developed empirical approaches to identify, at a detailed level, business service activities that are potentially exposed to international trade.

The common feature of these studies is that they assess the characteristics of occupations with a view to predicting offshoreability. Van Welsum and Vickery (2005) and van Welsum and Reif (2006) classify service occupations as having 'offshorability attributes': such occupations rely on the intensive use of ICTs, have an output that can be traded/transmitted with the help of ICTs, have highly codifiable knowledge content and no face-to-face contact requirements (van Welsum & Vickery, 2005: 12; van Welsum & Reif, 2006: 9). Based on these criteria, the authors evaluate for a number of available occupational classifications what service activities are potentially offshorable and then they calculate the potential employment impact of offshoring and outsourcing these. Kletzer and Jensen's criteria used to identify tradability and offshoreability are similar. Their initial approach is based on mapping the geographical concentration of service activities within the U.S. in order to identify which service activities are traded domestically, and then to classify those as potentially tradable internationally. Next, they complement this classification by adding task content in order to better typify jobs in terms of their offshoreability. Their empirical basis for this step is the information on the content and context of occupations that is available from O*Net, a US occupational database that provides time series with data containing qualitative information on job tasks, work activities (interacting with computers, processing information) and work context (face-to-face discussions, work with others, work outdoors, etc.) for approx. 450 occupations. The authors assess whether or not these characteristics are positively or negatively related to offshoreability and on this basis they combine these characteristics to form an index to classify occupations.

Goos, Manning and Salomons (2009), in another example of this type of research, aim to understanding the changes in the qualitative structure of employment better in relation to two main drivers: globalisation, which means the relocation of work, and technological innovation, which means the automation of work. In order to quantify changes in employment structures they have converted the US O*NET into the European occupational classification ISCO. The authors classify occupations according to their routine, abstract or service-based characteristics. They depart from the traditional dichotomy of 'routine - non-routine' task categories which is used in studies on automation (see below) but they broaden the non-routine category by contrasting routine with 'abstract tasks', which are described as tasks requiring complex problem solving, originality, convincing others or interpretation of information. In addition, by referring to Blinder (2007a; 2007b), they add the category of service tasks that cannot be carried out by computers (Goos, Manning & Salomons, 2009: 33-34).

The quantitative studies cited end with lists of occupations that can potentially be offshored. The main aim of the authors is to provide economic, trade and labour market policymakers with quantitative forecasts (Kletzer & Jensen, 2006; van Welsum & Vickery, 2005; van Welsum & Reif, 2006) or trends in the evolution of employment structures (Goos, Manning & Salomons, 2009).

2.3.1.2 Occupations versus jobs

The databases on which these studies are built include descriptions of a wide range of occupations while either an assessment of the task content by the researcher is used as the ultimate basis for the classification, or this is based on inferences concerning the characteristics of occupations from occupational databases. To distinguish between occupations that can be organised remotely, the different studies explicitly refer to the distinction between tacit and codified knowledge, between routine and non-routine tasks and between the importance or not of contextualisation and interaction. While the chosen attributes (convincing others,

interpretation, creativity, problem solving, flexibility, personal communication, personal contact, etc.) are plausible in themselves as forming limits to offshoreability, assigning them to a broad range of occupations listed in formal classification systems is subject to certain constraints.

The use of occupational classifications in studies of this type is typically necessary because of the absence of alternative sources that allow data to be aggregated, but the question remains of the extent to which service-based occupations in particular can be classified as generic and cross-sectoral based on the assessment carried out by researchers. For some occupations (hairdressers, nurses, taxi-drivers), their non-offshoreability may be clear, but for a whole range of occupations it is much less so. The problem is that the knowledge requirements of occupations may vary considerably between and within industries. Generally speaking, an occupation is not the same as a job. A developer in the software industry is not the same as a researcher in the pharmaceutical sector or a designer in a clothing company, a manufacturer in the steel industry has a different profile from a manufacturer in agriculture, and a salesperson in the travel and tourism sector needs different skills from a salesperson in the wholesale industry. One inspiring method used to overcome this intersectoral heterogeneity of occupations and to create aggregated, quantitative data at the level of the job rather than at the level of occupations is provided by job matrices, which cross-tabulate occupations and sectors (Fernandez-Macias, 2010; Vandekerckhove & Ramioul, 2011a).[17]

Another problem is that occupational classification schemes are not neutral. They reflect the historical emergence of a wide range of occupations based on skill differentiation and on vertical structures of hierarchy and authority. They constitute the formalisation, for statistical purposes, of historical and ongoing processes in the technical and social division of labour within the economy, leading to occupational differentiation (Fernandez-Macias, 2010). These schemes are the result of gradual processes of refinement and revision based on political compromises (for instance in view of collective bargaining) and specific types of organisational logic (for instance the development of internal career paths). Consequently there is a particularly uneven differentiation in terms of classification between occupations involving blue-collar work (highly diversified) and service work (much less differentiated), leading to a gender-biased classification. Additional complexity concerning the classification of service occupations is that the boundaries between adjacent/similar occupations are often blurred because several occupations can do very similar work, for instance 'numerical clerks', 'office clerks', 'other office clerks', etc. This problem is even more acute in relation to a range of so-called 'new' occupations such as web developer, content manager, etc.[18]

From our specific research objectives, two additional critical remarks can be made. First, we suggest that the simultaneous use of different job characteristics, notably routine, codified knowledge, knowledge requirements and contextualisation requirements, may be confusing. Second, just like the intersectoral heterogeneity of occupations, we argue that the organisational variety of jobs should also be acknowledged for the purpose of our study.

2.3.1.3 Contextualisation, knowledge work and routine

2.3.1.3.1 Routine and non-routine

When developing their criteria for non-offshoreability, the studies refer to the extent to which the occupations can be characterised as having uncodifiable content, as non-routine

17 Clustering of occupations within sectors was done to overcome this problem in the WORKS project, Geurts, Coppin and Ramioul (Geurts, Coppin & Ramioul, 2007) and has been further developed in the WALQING project (Vandekerckhove & Ramioul, 2011a).

18 In the EU-project STILE, the ISCO classification in so-called 'new' e-occupations in the Information Society is critically assessed (Ramioul *et al.*, 2005).

and as service-oriented and based on interaction. Leaving aside the service provision aspect and the interactive nature of the jobs for discussion later on, we will concentrate at this stage on the description of routine and non-routine and its association with uncodified content, knowledge-intensity and contextualisation.

For the distinction between routine and non-routine, major reference is made to a study by Autor, Levy and Murnane (2003). In their study, the distinction between routine and non-routine was used to construct indicators to assess potential for automation of occupations. The authors developed a task model in order to understand the skill content of technological change. The thesis is that computers either substitute for workers in performing routine cognitive and manual tasks or complement and support workers in performing non-routine problem-solving and complex communication tasks. A routine task is defined as a task that is 'a limited and well-defined set of cognitive and manual activities that can be accomplished by following explicit rules'. These activities can be accomplished by machines and are based on 'methodological repetition' (Autor, Levy & Murnane, 2003: 1280 & 1283). In this definition, the basis for defining routine directly refers to codified knowledge (explicit rules, methodological repetition, work carried out by machines). Since computers perform increasingly well at processing - 'storing, retrieving and acting upon' (*ibid.*: 1284) - information they also support, rather than replacing, the execution of cognitive tasks. This type of computer support is restricted, however, to cognitive tasks that do not require flexibility, creativity and complex communication. Furthermore, automation is not possible in the case of tasks that are associated with tacit knowledge, understood as perception, contextualisation, feelings and meaning: 'But in cases where perceptual problems, contextual knowledge, or feelings are involved, or where numerous exceptions apply, the substitution of a human agent by a machine is complicated or impossible. Computers are limited in their capacity to understand meaning, and therefore human interactions with a computer only work within a limited framework of rule-based selections.' (Sieben *et al.,* 2009: 555). The first tasks are defined as non-routine, the latter as routine.

Other authors also confine the involvement of contextual knowledge to problem-solving, complex, flexible, creative or knowledge work and conclude that these tasks are consequently non-routine. We have, however, already referred to Goos, Manning and Salomons (2009) who broaden the original non-routine category in their occupational classification to include 'abstract' tasks, described as tasks requiring complex problem solving, originality, convincing others or interpretation of information. In this way knowledge-intensive tasks (complexity, interpretation of information) and creative tasks (originality) are added in contrast to routine. From the strands of literature on knowledge work and innovation, the study by May (2002) on the organisational and occupational commitment of knowledge workers provides another illustration. The author draws on Gibbons' Mode 2 knowledge production category, which is context-driven, interdisciplinary and problem-centred, in contrast to 'Mode 1 knowledge production', which is academic, researcher-initiated and discipline-based. May states that one of the key features of knowledge work is the synthesis of theoretical and contextual knowledge, whereby contextual knowledge refers to 'knowledge of non-generalisable company policies or procedures and task-objects' (May, 2002: 779ff). This combination of theoretical and contextual knowledge occurs through iterative processes of diagnosis, inferences and applications to resolve complex problems (*ibid.*: 780).

In earlier works on organisational coordination, the distinction between routine and non-routine tasks is also related to contextualisation and codification (see for instance Perrow, 1967; Leifer & Delbecq, 1978; McDonough & Leifer, 1983; Cheng & Miller, 1985). In this literature, routine tasks concern a specified order in a well-known context for which known and formalised rules can be followed. Non-routine tasks are not specified at a detailed level

in advance and are therefore also described as unpredictable or 'uncertain' (McDonough & Leifer, 1983: 729), or as characterised by the extent to which 'there is variation in both the problems encountered and in the methods used to solving these problems' (Perrow, 1967; cited in Cheng & Miller, 1985).

2.3.1.3.2 What does (non-)routine really mean?

The linking of routine with the absence of contextualisation requirements, codified knowledge, and less knowledge-intensive work is not entirely surprising. It is plausible, and is indeed observed, that repetitiveness, as an essential characteristic of routine, statistically coincides more often with low-skilled jobs than with jobs requiring knowledge, skills or creativity, which are then consequently labelled as non-routine.[19] If such a relationship between different variables is statistically significant, the use of comprehensive indicators for statistical purposes, such as for constructing aggregate data, is intelligible. Our study, however, aims to provide an in-depth understanding of the processes of knowledge utilisation in the micro-sociological reality of day-to-day work and from that perspective linking non-routine to contextualisation, tacit knowledge, knowledge-intensive and creative work is more problematic.

A first problem arises due to the assumption that routine tasks are carried out using codified knowledge, 'accomplished by following explicit programmed rules', while non-routine tasks are based on tacit knowledge. In our view, the most essential characteristic of the distinction between routine and non-routine is that the former implies recurrent, repeated and, therefore often (although not by definition) predictable tasks and circumstances, while non-routine refers to non-recurrent, exceptional, and often (although not by definition) unpredictable tasks and circumstances. By using the key criterion of repetition, the basic description of routine tasks as 'a specified order in a well-known context' does indeed apply. The term 'standardised tasks' could, however, equally well be used. The addition 'for which known and formalised rules can be followed' is more problematic because it suggests that the knowledge required for routine tasks is necessarily codified. Based on the fundamental insight that human activity involves both codified and uncodified knowledge, it is clear that routine tasks also imply uncodified knowledge and that non-routine tasks also require codified knowledge. We would even argue that it is precisely because of their repetitive character that there will be more tacit, in the sense of uncodifiable, knowledge involved in routine than in non-routine tasks. Indeed the very definition of tacit knowledge is that it relies on 'subsidiary awareness' and 'rules that one uses without knowing'. If the worker turns his or her explicit attention to these rules, it is predicted that performance will drop, in other words that the routine will stop functioning as a routine. Tacit knowledge is essentially acquired through practice and consequently not in spite of routine but because of it.[20]

Following the same reasoning, the utilisation of codified knowledge in non-routine tasks should be acknowledged. If a doctor is confronted with a disease that she encounters only

19 In research on indicators of the quality of work the labelling of work as 'routine' is not uncommon. For instance, in the Flemish Werkbaarheidsmonitor (a large-scale survey on the 'workability' of jobs), the label 'routine work' is used as a popular, easy to understand term for this instrument's composite indicator 'task variation' which is developed by the VBBA (Vragenlijst Beleving en Beoordeling van Arbeid). The VBBA is a validated and widely used instrument used to measure job quality in the Netherlands. The VBBA indicator 'task variation' is based on six items: doing the same things over and over again, variation in the job, sufficient diversity of tasks, the requirement for creativity, the use of specific capabilities and skills, and the requirement of a personal contribution to the job. Jobs scoring low values on these six items are labelled as problematic in terms of task variation and denoted as 'routine jobs' (Bourdeaud'hui & Vanderhaeghe, 2010: 19ff). In this composite indicator 'task variation', three criteria measuring variation and repetitiveness are clustered with three criteria measuring knowledge-intensity. This clustering is based on the internal consistency (Rho-scale) of the indicator 'task variety' which is 0.82, which means that the coincidence of these six items is statistically significant (van Veldhoven, 2000: 100-101). A similar internal consistency (Cronbach alpha 0.824) was found in the Flemish questionnaire's first wave survey (Janssens, Bourdeaud'hui & Vanderhaeghe, 2004: 22).

20 See the earlier cited book 'Mind over machine' by Dreyfus, Dreyfus and Athanssiou for a convincing argument on how the shift from explicit to implicit knowledge occurs through experience and practice (Dreyfus, Dreyfus and Athanssiou,1986).

rarely, it may be her experience, tacit knowledge, that makes her conclude and 'feel' that there is something unusual about the symptoms, but at the same time it seems to be a good idea to consult her medical manuals to verify and specify the diagnosis and decide on the cure. At the same time, tacit knowledge is obviously necessary when a shift from routine to non-routine is required. If process operators in a nuclear plant are confronted with a non-routine, major disaster, they should ideally rely on their well-mastered routines for an adequate intervention. If, however, this mastery consists only of codified, theoretical, bookish knowledge, they, and we, will probably be in trouble. The routines of these workers will have to be trained and repeated endlessly, until they are 'embodied' and tacit, precisely so that they can handle crisis situations. Adequate crisis intervention requires all attention to be focused on the exceptional circumstances.[21] In conclusion, distinguishing routine from non-routine tasks on the basis of the use of codified knowledge ignores the importance of tacit knowledge in the former and of codified knowledge in the latter type of tasks. The routine/non-routine distinction is too ambiguous to serve as a way of categorising tasks in terms of their offshorability.

The second problem with the definitions set out above is that they mix up non-routine, knowledge-intensive and complex jobs. In these definitions, routine tasks are contrasted with abstract tasks, tasks requiring complex problem solving, originality, convincing others or interpretation of information. The basic description of a repetitive, routine task as 'a specified order in a well-known context' may, however, apply to short-cycled, Taylorised tasks on the conveyer belt just as well as to hip and knee operations. For a creative worker who has to come up with a new advertisement every week, originality is routine; for a salesperson, convincing others is routine, and for an academic, abstract thinking is routine. Similarly, some tasks that all these knowledge workers have to perform less frequently such as completing timesheets or travel expense forms are, while non-routine, probably easy and at least not by definition complex. While low-skilled and routine may statistically coincide more often, they should not be conflated *a priori*. Knowledge-intensity refers not to the non-routine-character of a job but to the type of work or the occupation, which determines the required levels of education and vocational training, the required levels of theoretical expertise, abstract, conceptual, interpretative and symbolic thinking, the mastery of a specific set of theories and methods, etc.

The third problem is the restriction of 'contextual knowledge' and the need for contextualisation to non-routine and knowledge work. It has been stated that contextualisation refers to actively obtaining, using and applying information from the environment in the execution of a task and this is, as a matter of fact, a generic mechanism involved in applying tacit knowledge in human activity. The requirement for contextualisation may, of course, differ considerably, for instance when we compare services provided to individuals, driving, cleaning or technical helpdesk work with assembly work, accounting or administrative tasks. Linking contextual knowledge with non-routine tasks and defining knowledge work as 'a synthesis of theoretical and contextual knowledge', however, neglects the intrinsic contextualisation that can be identified in work regardless of the skill level required.

Overall, the essential criterion to distinguish routine from non-routine is repetition as contrasted to exception. While it may be plausible that tasks that are repetitive and involve 'a specified order in a well-known context' are preferentially considered for relocation, this criterion is not sufficient to assess their feasibility for such restructuring. There may be strong arguments to consider the relocation or outsourcing of exceptional tasks as well. Other task characteristics therefore play also a part. The criteria associated in the studies with non-rou-

21 Christis (2009) describes very precisely the importance of routines in organisations characterised as so-called High Reliability Organizations, where failures are daily business.

tine work and which are explicitly addressed in the above studies deserve to be used separately rather than collapsed into the concept (non-)routine. These include both knowledge-intensity, which comprises requirements such as abstract thinking, complex problem-solving, interpretation of information, etc., and also interpersonal demands, including both collaboration with colleagues and provision of services to clients and customers. The knowledge typically required for these types of tasks is more difficult to codify and to share remotely and these are important reasons why jobs comprising such tasks are less prone to relocation. In the sections below we will look in greater detail at knowledge-intensity and interaction requirements and how these are linked with codifiability.

Before doing so, the question arises of whether these two characteristics of tasks will provide a sufficient basis to make conclusive judgements on their relocation potential as long as the organisational varieties of the tasks in question are not considered. This is, in fact, a similar problem to the one encountered in relation to the concept of a business function in Chapter 1, which was at risk of being isolated from the logic of the organisation when it was defined as generic.

2.3.1.4 Bringing the organisation back in

As we have seen, it is not possible in aggregate statistics to take into account the organisational context in which specific occupations are embedded. This is a disadvantage because not only the type of work but also the way in which this work is organised determines the utilisation of knowledge and consequently the extent to which a job can eventually be relocated.

As was explained in detail in the first chapter, the structure of the technical division of labour and of the regulation results in tasks that may range from fully integrated to highly fragmented functions, with high or low potential for regulation. Integrated tasks and tasks with high decision latitude support learning because the worker is given sufficient opportunities to solve work-related problems and to exchange information. Not only the utilisation of codified knowledge but also contextualisation, as when actively using information from the environment, and improvisation, as a necessary complement to formal instructions, are fostered and stimulated when jobs include sufficient opportunities to plan and prepare the tasks, to regulate their different aspects including solving problems and disturbances, to obtain support and feedback, to interact with colleagues and superiors, etc. Such integrated tasks create favourable conditions for the generation, utilisation and circulation of knowledge - particularly tacit knowledge. Consequently there is a risk that this knowledge will be lost through restructuring and that the restructured production process might not 'work' as it should, at least initially. The workers assigned to the restructured tasks will have to rebuild sufficient levels of knowledge by means of contextualisation and improvisation, depending on the opportunities they are given to do this.

Where jobs are limited to 'making' and do not involve planning, preparation and control, where jobs include no scope for regulation or opportunity for interaction and where they are, in addition, fragmented into short-cycled, standardised operations, they tend more easily to end up as the 'limited and well-defined set of cognitive and manual activities', referred to by Autor, Levy and Murnane in their automation study. Short-cycled, standardised and fragmented tasks do not provide many opportunities to apply and develop job-related skills and tacit knowledge. For that reason they are quite likely to be less spatially bound.

Overall, forecasting offshoreability does not appear to be an easy task. Based on the insights gained so far, the hypothesis is that knowledge-intensive work and interactive work are more difficult to relocate because they have a strong reliance on employees' input and in any case more so than in less complex, well-defined manual or cognitive tasks, which are

chiefly based on easier, codified knowledge or where little social interaction is required. The former types of work depend more on the skills and knowledge of the workers and they intrinsically include more uncertainty and unpredictability, which is why it is more difficult to anticipate exactly how the tasks must be carried out. This makes their relocation more difficult. The actual utilisation of both codified and uncodified knowledge at work, however, including its use in contextualisation and improvisation, depends not only on these typical task-characteristics but also on the way in which the tasks are designed in the organisational structure. Therefore, a second hypothesis is that spatial restructuring not only depends on the generic knowledge characteristics of activities but is also influenced by the specific organisational context. Similarly as we concluded in Chapter 1 to look at business functions in relation to organisational decisions, we plea again to bring the organisation back in when assessing tasks in terms of their offshoreability.

In the following sections, we will zoom in more closely on knowledge-intensity and requirements for interaction, using a selection of empirical studies as a key step towards designing the empirical phase of the study.

2.3.2 Interaction in customer services work

2.3.2.1 The specific features of service work

From the theories set out in the previous sections of this chapter, the importance of social interaction in the utilisation, circulation and generation of knowledge and in contextualisation have come prominently to the fore. Social interaction is emphasised particularly strongly in customer services work. The quantitative studies that have been discussed intentionally focus on the potential to relocate service work with the help of ICTs and they identify interaction and service provision as key characteristics when assessing relocation potential. In addition to this quantitative approach, a lot of qualitative research has also been carried out on this issue.

In this strand of literature, services are typically described using five characteristics that distinguish them from material products: intangibility, the simultaneity of production and consumption (the so-called uno acto principle), variability related to the human whims of both the service provider and the consumer, perishability (it is impossible to 'store' services) and inseparability (the service is produced jointly by the service producer and the service receiver) (Korczynski, 2002, cited in Flecker, *et al.,* 2008). These characteristics imply that services are essentially bound to the social interaction between the producer and the recipient of the service and that the provision of the service inherently involves a fair amount of uncertainty and contingency. In line with this, various studies highlight personal and/or face-to-face interaction in services as a key factor hindering offshoring and automation. The occupations listed in the quantitative studies use labels such as 'face-to-face' requirements, 'personal' services, and 'convincing others'. Further, Blinder (2007a & b) assesses services in terms of their offshoreability when they: '(...) can be delivered [to its end-user] electronically over long distances with little or no degradation in quality'. He concludes that only 'impersonal' services, requiring not much face-to-face interaction, are potentially vulnerable to offshoring (*ibid.*: 2-3). He assesses this criterion as being more pertinent to the offshoring debate than the traditional routine/non-routine distinction. Blinder regards the personal/impersonal criterion as a continuum (rather than a dichotomy) marked by the extent to which the service degrades when it is offshored. This (im-)personality aspect of services is considered important regardless of the skill level of the occupations.

From the perspective of knowledge utilisation, the essence of service work situations is that social interaction is a way of contextualising, in other words a way of obtaining additional information from the 'environment' by means of an iterative and interactive process involving communication and exchanges with the service receiver. This social interaction is necessary in order to take the right decisions to provide the service. Typical examples of service tasks involving social interaction are selling, teaching, problem-solving, care work, personal services (such as hairdressing, caring) consultancy and advice. While it will never be possible to automate several of these types of work, work based on social interaction is also subject to rapid changes brought about by the use of ICTs. These technologies have seen fundamental changes in the extent to which services can be carried out over distance: 'The digital convergence between communication technologies and computer technologies has rendered feasible any combination of communication forms (between individuals, organisations and machines) and creates possibilities to network, interact and communicate around the world' (Soete, 2001: 143). ICTs have contributed towards shifting the limits of the typical features of service work. The fact that ICTs contribute towards minimising face-to-face interaction requirements can be illustrated using a huge number of examples, ranging from call centres to e-learning, e-counselling or telemedicine.

2.3.2.2 Degrees of interaction

Some further specifications to analyse the need for social interaction in customer services work can be found in literature. Studies on call centres, which have grown almost in parallel with the particularly fast and global spread of this industry have given particularly strong impetus to theoretical discussion of customer services work. The Global Call Centre project, for instance, has demonstrated that the call centre industry contains workplaces that are highly differentiated in terms of job quality, employment conditions and labour relations (Batt, Holman & Holtgrewe, 2009). Major determinants of these differences are related to the product strategy and the customer market segment, specifically mass market customers *versus* business customers, which appear to be decisive in determining the organisational structure of the customer services function either as an in-house department or as a subcontracted call centre (*ibid.*: 470). Holman, Frenkel and Sørensen (2009) show how variations in work design in call centres are related to the type of customer services. This work design varies between very short encounters, for instance simple requests for information, and customer relations that involve repeated interactions and trust-building (Holman, Frenkel & Sørensen, 2009: 512). Job discretion is higher and performance monitoring lower where the customer's needs are more complex and require efforts to build a relationship and commitment from the employees. In the latter situation the call centre jobs are more complex (*ibid.*: 527).

Valenduc *et al.* (2008: 144ff) similarly refer to this difference in service provision when they state that the need for social interaction in customer services depends on three service characteristics. The first is the degree of interactivity or the frequency and intensity of contacts between the customer and the employee in the service relationship. The second is the degree to which services are personalised; this is the degree to which services have to be customised (in our words: contextualised) to the needs of the customer or, conversely, the extent to which they can be standardised. The third is the time dimension of the service relationship (short or longer contact) and the need for follow-up (*versus* one-off questions). These criteria are decisive in determining the complexity of the service. Combining these criteria, it is possible to identify, at the one end of the spectrum, extremely short, repetitive and often simple questions from customers implying no real personal interaction. These 'encounters' with the customer can - and often are - easily codified in scripts, protocols and procedures, increas-

ingly digitised and closely directed and monitored by ICTs. It is feasible to organise such customer services remotely. At the other extreme are those services for which the direct environment cannot be decoupled from task execution. In other words the services are based on the inseparability or simultaneity of production and consumption (the uno-acto principle), such as cleaning, physiotherapy or transporting people. Both temporal and geographical proximity are, by definition, indispensable for such services (Soete, 2001).[22] In between there are a wide range of more or less complex and difficult requests for advisory services, consultations and interventions, requiring more or less intensive, frequent, personal and/or long-lasting interactions. Sometimes these occur in crisis situations or in situations requiring urgent action and mobilising the professional knowledge and interpersonal skills of the employee to guarantee a high-quality response.

From the insights gained about this type of work, it is therefore important to remember that a broad range of customer services exist, between which a dividing line can apparently be drawn distinguishing, on the one hand simpler, short, repetitive services with low interaction requirements and relatively codifiable responses. This type of customer services will qualify most easily for (automation and) relocation. On the other hand, there is more complex service work which requires face-to-face contact and intensive interaction and which is much more location and context bound as a result. Here, the tasks are more complex and more interdependent of contextualisation and the outcome is less certain and predictable *a priori*. According to the literature on call centres, not only the characteristics of the specific customer services as such, but also differences in work organisation between customer services activities occur along this dividing line.

2.3.3 Knowledge-intensive work

A wide range of studies have been carried out on knowledge-intensive work, focusing on the organisation of distributed collaborative work. A considerable number of these deal with IT activities such as software development work, since this is typically organised within geographically distributed teams due to the globalisation of IT companies. Software development, as a type of innovative and complex project work, is a popular target for research on virtual collaboration. Other research has looked at different types of knowledge work. We select studies that are interesting in that they also include leads on how organisations try to solve the problem of uncodified knowledge in geographically distributed collaborative work situations.

2.3.3.1 Knowledge work in the IT sector

While the complexity of work in the IT sector is not under discussion, a number of studies have emphasised that organisation of work in this industry is increasingly based on codification and the partitioning and modularisation of work into parts that divide complex development tasks from more standardised tasks (Maenen, 2010: 66ff; Mirani, 2007).

In Holtgrewe's study on software development in distributed teams (Holtgrewe, 2008) the corporate strategies and practices used to organise knowledge-intensive work remotely refer to different forms and modes of knowledge codification involving all processes, procedures and (contractual) relations between the relevant actors. She demonstrates how a clear definition of tasks and interfaces is put forward as critical for virtual collaboration. In order to reduce the uncertainty that is inherent in innovative project work: 'Companies develop the processes and routines that support the co-ordination of distributed development projects by

22 For some activities, the use of ICTs may shift the boundary in terms of the simultaneity of production and consumption, as examples such as tele-medicine or tele-counselling demonstrate.

standardising requirements, architectures, and feedback and quality control routines' (Holtgrewe, 2010: 12). Standardisation in this context refers to: 'a systemic approach that introduces formalised development processes which span the whole lifecycle of software, coordinate work on a global scale within the company, and try to assure quality control of a range of very complex products. Thus, integration is achieved by multiple technical and organisational means: by using common code libraries, by project management and a formalisation of requirements and architecture definitions, feedback loops, testing procedures and so on.' (*ibid.*). Further, one strategy to secure control over quantity and quality, which is generally pursued when sourcing services, involves putting in place Service Level Agreements that specify operational procedures in detail. At the same time, working across boundaries, both geographical and cross-company, implies the need to facilitate remote collaboration through a variety of interventions. These include the rearrangement of workflows and modes of communication.

Mirani's research (2007) is interesting in that he shows how strategies concerning the codified parts and the uncodified parts of software development have to be combined. This is because, despite the attempts that have been made to codify this type of work, software-related tasks are still highly interdependent 'by their very nature' (Mirani, 2007: 216). Based on his literature review of existing studies and on his own empirical work, Mirani emphasises the importance of managing this interdependency between dispersed teams through codification of project development and by carefully specifying and partitioning tasks between teams. Task partitioning is found to be important because it reduces the amount of knowledge transfer required (*ibid.*: 227).

The author emphasises, however, that it is critical to complement such interventions with mechanisms to integrate work in order to bridge the gaps in contextual knowledge and communication. This integrative strategy seeks to establish a learning-oriented setting and systematic information flows based on both formal and informal interaction channels across company boundaries. Mirani further observes that these integrative mechanisms differentiate between 'organic' coordination techniques, based on an informal, cooperative and decentralised approach, and 'mechanistic' strategies, based on a formal, controlling and centralised approach (*ibid.*: 218). The first are assessed as more effective, especially for complex and interdependent work. Similar conclusions are found in the cited study by Maenen (2010: 285) and in Eide's research on knowledge-intensive professional services, teleradiology and sophisticated data analytics in the medical and financial industries that are offshored to India (Eide, 2010). The latter author observes how tacit knowledge and soft skills, defined by the author as 'embodied cultural capital', are codified, captured and disseminated by a variety of means such as one-to-one mentorship, visual knowledge sharing sessions and training.

In all, the various studies that have been explored all suggest that, just as in the case of customer services, it is also possible in software development work to identify parts of the work that are more easy to codify, separate and standardise, while for other parts of the work the outcome is more uncertain, because tasks are complex and more interdependent.

2.3.3.2 Sticky knowledge

In the strand of literature on geographically distributed work in the IT industry, von Hippel's work on innovation-related technical problem-solving is a key reference (von Hippel, 1994, 1998). He introduces the concept of 'stickiness' of a given unit of information in a given instance, which is defined as 'the incremental expenditure required to transfer that unit of information to a specified locus in a form that is usable by a given information seeker' (von Hippel, 1994: 430). Stickiness of information refers to information that is costly to acquire, transfer and use. Von Hippel speaks of an information 'transfer in useable form'. This refers

to costs involved in codifying information and also to the amount of information that would have to be transferred or the requirement by the information-seeker to invest in skills so that he or she is able to use the information (*ibid.*: 430-431). With respect to the latter, information that relies on abstract, theoretical knowledge that can only be acquired after a lengthy period of education, training and experience may be defined as sticky. The restricted access to such complex bodies of knowledge and the limited opportunities to share them with others will hamper their transfer and will require the presence of qualified persons or specific investments in training to allow access to this knowledge.

Von Hippel demonstrates how, in technical problem solving, the most (cost-)effective solution is not always to invest in 'unsticking' or reducing the stickiness by codifying information, but that other solutions may also be used. These include: keeping the information on site and bringing the problem that has to be solved to the place where the knowledge is available; iterating problem-solving between different units that possess part of the knowledge needed; or 'task-partitioning' the problem. Although the study is limited to technical problem-solving in software development, the relevance of von Hippel's work is twofold. Firstly, the author emphasises how stickiness of information or knowledge is not necessarily restricted to uncodified or tacit knowledge, but that it may also concern codified knowledge that is complex or vast. Secondly, he demonstrates how different actions, and not only codification, may be able to solve the stickiness problem, such as task partitioning, iteration and interaction between different locations, or investments in local skills. This implies that the distance between the information needed to solve the problem does not necessarily have to be bridged by moving the information, because this may be technically impossible or too costly.

2.3.3.3 The role of distance and proximity in knowledge processes

Schamp, Rentmeister and Lo (2004) investigate the role of proximity in the governance of knowledge processes in knowledge-intensive business service networks, more precisely in M&A projects in the banking sector and in design projects in the automotive sector. The key research question concerns not the type of knowledge in networks but the question of the extent to which knowledge creation depends on both geographical and non-local forms of proximity. The authors state that knowledge creation is supported by the sharing of tacit knowledge and by the establishment of social relationships. Trust is a key issue in establishing the conditions for knowledge sharing and creation.

According to Schamp, Rentmeister and Lo, different forms of proximity can contribute to the organisation of knowledge processes in knowledge-intensive networks. They distinguish between professional proximity, which allows sharing of specific professional language, codes and norms; organisational proximity, which is necessary to share rules, routines and conventions within an organisation; and personal proximity, which contributes towards creating mutual trust. A key finding for our study is that firms have a diversity of resources and use a mix of proximity modes to govern the knowledge processes in distributed, knowledge-intensive businesses. These include putting in place a specific 'transaction leader' for network co-ordination, changes in the division of labour in design projects through outsourcing to specialised service providers, implementation of a parallel and modularised organisation of design (rather than a sequential design process), the use of different contract types, the digitisation of content and the introduction of new technologies establishing 'virtual' proximity for inter-firm communication. Other interventions, which are commonly used in transnational companies, include temporal mobility of employees, shifting tasks between specialised branches and temporary meetings (at airports or other centrally located meeting points) for short-term geographical proximity, which is typically required at the start of a project. In

all, geographical proximity still remains an important tool when it comes to creating trust and overcoming the barriers of tacit knowledge because: 'Geographical proximity seems to reduce intransparancy and hence uncertainty' (Schamp, Rentmeister & Lo, 2004: 621).

When referring to knowledge creation processes in knowledge-intensive services, Schamp, Rentmeister and Lo associate tacit knowledge with professional norms and values, routines and conventions and mutual trust. The main relevance of this study is to differentiated organisational practices to secure the circulation, sharing and creation of these knowledge dimensions among distributed knowledge workers, including changes in the division of labour in the process, the use of technologies and putting in place specific coordination and boundary-spanning functions. It is important to remember this range of management interventions used to bridge distance.

2.3.3.4 Permanent iterations

A number of studies have focused on work situations requiring more permanent, rather than project-based, remote collaboration. These describe various different situations (Valenduc, 2007; Vandenbussche, Devos & Valenduc, 2007: 36). In the usual IT vocabulary, according to Valenduc (2007) 'subcontracting' is used to refer to the outsourcing of specific or specialised IT tasks, while the focal company maintains control over the design and management of its own IT system. Subcontracting mostly covers specific software development, web design or web hosting, e-commerce platforms, technical maintenance contracts, etc. Subcontracting is used as a flexible model. It can coexist with in-house capacities. It includes a mix of short-term or mid-term contracts, linked to specific tasks or projects, with several specialised subcontractors. The term 'outsourcing', in contrast, is mostly used in IT jargon when it concerns a wide range of technical services belonging to the core IT system of the organisation, which are transferred to a limited number of IT providers on the basis of long-term contracts. This often leads to the relocation of system management and control beyond the organisation. This type of more comprehensive collaboration in IT is referred to in French as 'infogérance'. It is a trend whereby organisations confine their IT activities to one or more external service providers. It is typically found in the public services sector (Valenduc, 2007: 1ff; Schuppan, 2009). This 'outsourcing' or 'infogérance' can involve a wide range of activities such as: the management and maintenance of applications, hosting databases, software and servers, the remote management of infrastructures, networks, etc. (Valenduc, 2007).

One step further in this trend concerns Business Process Outsourcing (BPO) where a service provider takes over the full set of functions which have a strong ICT component (including: purchase, accountancy, customer relations management, administration, etc.) (*ibid.*). Such comprehensive outsourcing agreements may have far-reaching consequences, especially for public administrations and public services. They may, for example, involve the separation of front-office and back-office services, creating a single access point for the customer, and establish new forms of work sharing between public and private agencies (Schuppan, 2009). Such forms of IT outsourcing mean that part of the technical infrastructure is decoupled from the organisation, which results in a virtually permanent need for remote collaboration between the service provider and the outsourcing organisation. This permanently dispersed knowledge will involve continuous interdependencies, requiring systematic and interactive regulation by the organisations involved and consequently requiring specific coordination efforts (*ibid.*: 819, 827).

2.3.3.5 Knowledge in global value chain governance

A final example of qualitative research is the study of global value chain governance by Gereffi, Humphrey and Sturgeon (2005). These authors state that knowledge related to economic transactions is a key factor in decisions on the mode of economic governance of global value chains. Central to their work is the analysis and description of global value chains as inter-organisational networks. The prime perspective is on the different economic modes of governance and on relations between organisations as trade partners in global value chains. The authors differentiate between the economic governance modes of activities governed by markets (outsourced), organised in bureaucratic hierarchies (organised internally) or governed according to other modes situated between these extremes: modular, relational or captive relationships.

They observe that three criteria account for the differences in the economic governance mode: firstly, the complexity of information and knowledge transfer required to sustain a particular transaction with respect to product and process specifications; secondly, the extent to which this information and knowledge can be codified and therefore transmitted efficiently and without transaction-specific investment between the parties to the transaction; and thirdly, the capabilities of actual and potential suppliers in relation to the requirements of the transaction (*ibid.*: 85). The authors argue that those bodies of knowledge that are complex and difficult to codify will be governed according to a bureaucratic or relational governance mode, implying long-term relationships based on trust, rather than according to market relationships. The criteria of complexity and codification refer to the (non-) existence of standardised product and process specifications (standards and protocols) and (restricted) access to technologies and software. Gereffi, Humphrey and Sturgeon emphasise the dynamic character of the codification of knowledge in a particular industry: 'These variables [*i.e.* the "complexity of transactions" and "the ability to codify them"] are sometimes determined by the technological characteristics of products and processes (some transactions are inherently more complex and difficult to codify than others, for example) and they often depend on the effectiveness of industry actors and the social processes surrounding the development, dissemination, and adoption of standards and other codification schemes' (*ibid.*: 98).

This study is conceived in the first place to understand trade relationships between firms in a global value chain, so that it belongs to the strands of economic literature that were explored in the first section of Chapter 1. The analysis of work in the different units of the value chain is not developed. It is interesting to note that the authors emphasise the economic mode of governance and the duration or stability of economic trade relations (the bureaucratic and relational mode of governance as contrasted to pure market and so-called captive relations), rather than the geographical distance between activities in the value chain. They put forward trust and long-term relationships as key answers to the limitations of codifiability, rather than proximity as such. Further, it is important to note the definition of codified knowledge used in this study: the existence of industry-based standards and protocols. This definition is in line with the (macro-) economic approaches, rather than with the one adopted by authors on organisational learning or those who contrast codified knowledge with practical or contextualised knowledge on the shop floor.

2.3.4 Summary

2.3.4.1 What tasks can be relocated?

All the selected studies focus on the limits that specific knowledge requirements of jobs place on their relocation, on the impact of distance on the generation, utilisation and circulation of knowledge, and on interventions to bridge that distance.

Overall, it is confirmed that tacit and uncodified knowledge are key factors in remote work, or in other words those parts of the work that are based on knowledge that is or can be codified will qualify more easily for relocation. Given the basic definition of codification as 'structured data and the necessary instructions for its processing' (Johnson, Lorenz & Lundvall, 2002: 247) and its essential characteristic of transferability, this sounds logical. Nevertheless, in the studies explored the explanation of what can be called codified, tacit and uncodified is sometimes explicit, sometimes more vague and in any case diverse. Codified knowledge ranges from the existence of available industry-specific standards, protocols and product and process specifications (Gereffi, Humphrey & Sturgeon, 2005) to different forms of 'systemic standardisation' (Holtgrewe, 2008) and 'routine' tasks. Uncodified knowledge is associated with inter-personal trust and professional norms (Schamp, Rentmeister & Lo, 2004) or it is specifically assigned to a specific range of interactive customer services. Interestingly, the role of uncodified knowledge as a generally present key component in all day-to-day working practice does not seem very prominent in the studies reviewed. In accordance with theoretical insights on knowledge, it is our explicit objective not only to look at knowledge as associated with knowledge-intensive work, but to include work regardless of the skill levels required. Furthermore, the fact should be acknowledged that what is codified, uncodified and uncodifiable is time-dependent and context-dependent. In an organisational context it is important to distinguish between codified, uncodified in the sense of undocumented for the organisation and 'informal', and tacit, in the sense of uncodifiable subsidiary awareness and implicit even for the user.

The different studies explicitly link the codification potential to specific characteristics of both service work and knowledge-intensive work. Complex and difficult requests for advisory services, consultations and interventions requiring intensive, frequent, personal and/or long-lasting interactions are identified as relying to a large degree on tacit knowledge which is reflected by the fact that they require a fair degree of contextualisation. The production and development of complex products, as for example in IT, requires abstract knowledge, complex problem solving and complex information and this makes those tasks often highly interdependent.. Both types of work, interactive work and knowledge-intensive work, share both an intrinsically high level of uncertainty and unpredictability and also a high level of interdependency. These features increase contextualisation requirements and limit codifiability.

While codification is generally identified as a necessary condition for remote transfer, however, it also appears that it is not sufficient. Von Hippel brings the notion of sticky knowledge to the fore, which is defined as knowledge that is too costly to transfer, not only because it is uncodified but also because it is vast, complex, or otherwise bound to specific individuals or to local conditions. Access to such complex bodies of knowledge is limited and transferring them is difficult and costly and requires specific investments. Von Hippel's conclusion that codified knowledge may also be difficult to transfer is important for this study. It confirms that the distinction between uncodified and codified knowledge is not sufficient to assess offshoreability. In this sense, von Hippel's notion of sticky knowledge provides a practical alternative for the traditional contrast between codified, uncodified and tacit. While it was introduced specifically to investigate technical problem-solving in IT and origi-

nally defined in terms of 'costs for the transfer', the notion of stickiness may serve as a synthetic concept, encompassing a range of task characteristics that may in one way or another limit transfer over distance. These task characteristics boil down to either knowledge-intensity and interaction requirements and the main reason why they limit offshoreability is that the outcome of these tasks is more uncertain and unpredictable and they tend to be more interdependent.

In all, it seems that drawing conclusions, let alone making forecasts, on which jobs can be relocated is a complex matter. None of the characteristics seems adequately to explain why tasks can or cannot be relocated and for each of the criteria there is a gradation as to how 'sticky' they actually are. The knowledge requirements will set the conditions for the organisation of the work but at the same time the actual knowledge utilisation is also determined by the technical division of labour. It is important to emphasise that knowledge requirements as such are not to be interpreted as sticky, in an 'absolute' sense, but rather their relation to specific tasks in the network of jobs generated in the organisational structure. As a result, offshoreability is a contingent qualification. The resulting task characteristics may also refer to the notion of 'human asset specifictiy', as one dimension of the asset specificity of Williamson's transaction cost theory, pointing at the degree to which skills, knowledge and experience are organisation-specific and consequently complicate outsourcing (Dibbern, Chin & Heinzl, 2005). The overall hypothesis resulting from these insights is that it is the specific combination and gradation of the knowledge characteristics as well as the organisational context that will jointly define the dividing lines and define the conditions for spatial restructuring.

2.3.4.2 What can be done about this?

Most qualitative studies list a range of management interventions that are used to bridge the gap between transferred and non-transferred knowledge. The selected studies on knowledge work all make the same observation: that the codification of complex knowledge is an explicit and ongoing process in view of the organisation and coordination of these knowledge-intensive production processes across distances. Strategies used for task partitioning or modularisation, systemic standardisation, the design and instalment of procedures and standards, etc. present themselves as indispensable for their functional coordination.

At the same time, the studies demonstrate that these strategies are not sufficient and have to be complemented by other modes of knowledge management intended to establish knowledge-sharing and trust, foster a learning-oriented setting and create opportunities for collaboration due to the high and persistent interdependencies between the remote activities and their uncertain outcomes. These are required in order to bridge the gaps in contextual knowledge and communication.

In order to combine both strategies, different methods and interventions are applied. These include both measures to facilitate the exchange of tacit knowledge: strategies related to the allocation, mobility and training of employees, investment in skills, mutual trust and social relationships and mobility of the workforce are observed. These can be seen as efforts to improve the conditions for the generation, utilisation and circulation of tacit knowledge through social interaction. On the other hand, efforts are made to codify knowledge further in anticipation of its transfer by means of the standardisation and 'contractualisation' of procedures, the formalisation of collaboration and so on. It is important to emphasise here that a number of studies have demonstrated how companies combine and apply a mixture of strategies to take into consideration the complex relationship between different types of knowledge in order to establish workable collaboration over distance.

Overall, these conclusions reinforce two points: firstly, the relationship between codified and uncodified knowledge is dynamic and context-specific and a dividing line cannot be drawn neatly or permanently; secondly, management may explicitly address knowledge in its strategies concerning the spatial distribution of work. These conclusions provide grounds to argue that the analysis of spatial restructuring benefits from approaching it as a process. This means focusing the analysis on reconstructing how a management decision to spatially restructure unfolds in reality: what range of management interventions take place during restructuring and why; how and why these decisions are adapted during the implementation; what is the impact of employee agency and the outcomes of all these decisions, strategies, agency and interactions.

All these questions are pertinent when empirically investigating spatial restructuring processes from the perspective of knowledge utilisation.

2.4 Summary

In this chapter we have clarified how knowledge is conceptualised and why it is a relevant factor in spatial restructuring. First, a number of theoretical approaches on the significance of knowledge for organisations were explored. We reached conclusions on knowledge codification as a management strategy and on the importance of tacit and uncodified knowledge for the organisation. It was also emphasised that, due to the existence of tacit knowledge and the basic human need to create use-value in the labour process, workers' knowledge is a fundamental aspect of the indeterminacy of the employment contract. It is consequently subject to the complex and contradictory relations between management and workers, and this is reflected in the variety of management strategies to manage knowledge in the labour process, in the variety of modes of employee agency and in the ultimate outcome of how labour power is eventually transformed into labour.

Second, we identified two ways by which workers bring their knowledge into work. Through contextualisation, they extract information from the environment in order to adapt task descriptions to the concrete circumstances. In contextualisation they combine their codified and tacit knowledge. Improvisation is a way of complementing the organisation's orders and expectations that are generally incomplete and insufficiently detailed. Through these processes they bring tacit and uncodified knowledge to bear to carry out the work. Both processes are direct emanations of indeterminacy and they may be used either to reach the company's goals or to serve the worker's needs, which are not necessarily compliant.

Third, we explored some empirical studies to gain more insights into different types of work that are organised remotely and where knowledge has to be managed accordingly. This exploration confirmed that uncodified knowledge is commonly identified as a key factor that must be taken into account in remote work, but also that codification is not a sufficient condition to make a geographical transfer feasible. It also emerged that there are different ways in which codified knowledge and the tacit dimension are operationalised in research. The studies also listed different strategies for the management of knowledge in spatially distributed work. These strategies not only concern codification efforts but also interventions in the technical division of labour and in the functional coordination of the transformation process, as well as in the employment regulation. All these interventions aim to facilitate the generation, circulation and utilisation of uncodified and codified knowledge. Linking up to the first chapter, this mixture of strategies aligns with the fundamental management orientation of combining strategies to bring about both autonomy and control.

The studies that have been explored enabled us to distinguish more clearly between types of work where knowledge requirements differ. Knowledge utilisation is primarily determined

by the type of work, and here we essentially identified knowledge-intensive work and interactive work because these are likely to make tasks interdependent, uncertain and unpredictable. Knowledge utilisation is also, however, determined by the structure of the technical division of labour that defines the conditions for spatial restructuring and influences its outcome. At the same time, spatial restructuring and potentially related changes in the technical division of labour will impact on the conditions for knowledge utilisation in the restructured labour process.

During the development of these theoretical perspectives for investigating knowledge in spatial restructuring, several research questions came to the fore. The first question is: 'What is the relationship between the specific knowledge characteristics of activities and the design, implementation and outcome of their spatial restructuring?'. Second, 'What range of managerial interventions concerning the management of knowledge are deployed in relation to the spatial restructuring and how can these interventions be explained?'. Third, 'What knowledge utilisation practices are used by workers in the restructuring context and how can these be explained?'. In order to address these questions, it is essential to analyse spatial restructuring as a process. This is necessary if we want to take account of the dynamic character of knowledge utilisation, where codified, uncodified and tacit knowledge undergo constant and dynamic transformations and if we want to take account of the employment relationship as a key determinant of change processes, where management and workers shape the actual labour process in a dialectic interaction.

In the next chapter we will design the empirical research to provide answers to these questions.

3 | Method and design

Introduction

This third chapter sets out the design for the empirical phase of the study. This will be done in four sections. In this introduction we review the overall research objectives and main research questions. We then justify the decision to use a case study approach and describe the data collection process in the WORKS project. After this we clarify the selection criteria and sampling method and finally, we describe the different steps in the data analysis.

In the first chapter it was explained that the focus of this study is on the spatial restructuring of work, understood as the redistribution of functions and tasks between geographically dispersed units. A primary objective of the study is to investigate the relationship between spatial restructuring and the technical division of labour. Changes in the technical division of labour can be described by analysing the coupling or decoupling of operational and regulatory functions at different levels, business functions and the tasks of which they are composed. In theory relocation will not necessarily affect the structure of the technical division of labour. Organisations may decide to change the spatial allocation by lifting and shifting part of the transformation process to another location (just as they can, in a similar way, shift work to another organisation by means of outsourcing). On the other hand, decisions to change the technical division of labour may also alter the conditions for spatial restructuring. In the first chapter, we decided to analyse the process and outcome of spatial restructuring from the perspective of the organisation, which is composed of two interlinked subsystems: the structure of the technical division of labour and the employment relationship. It was also emphasised that the technical division of labour is determinant for the job quality and for the conditions of knowledge utilisation, which is of relevance for our second research endeavour.

In Chapter 2, a number of theories and studies on knowledge in the organisation were investigated in order to better specify the original question, which was formulated as follows: how does knowledge play a role in spatial restructuring? Here the importance of uncodified knowledge and the conditions for its utilisation, generation and circulation came to the fore. Knowledge-intensity and interaction requirements were identified as two key knowledge characteristics of tasks that may limit their relocation because these tasks are more uncertain, unpredictable and interdependent. It was further emphasised that, as well as the type of work, the organisational structure will also define the conditions for knowledge utilisation in work and therefore play a role in restructuring. From this knowledge utilisation perspective, contextualisation and improvisational work practices were identified as the day-to-day processes whereby workers bring their knowledge to the labour process. Both modes of knowledge utilisation demonstrate the limitations of codification and make it difficult for knowledge 'to travel'. Consequently, it is expected that the type of work and the organisational structure will jointly define the conditions for spatial restructuring. In order to deal with these conditions, management is likely to deploy specific strategies and interventions to manage knowledge issues in restructuring processes.

In both the first and the second chapters, the decision to analyse spatial restructuring from the perspective of the employment relationship was explained. First, the employment relationship is the second subsystem of the organisation which is needed to allocate and regulate work to achieve the organisation's objectives. Indeterminacy is an essential characteristic of the employment contract and because of the uncertainty surrounding the transformation of labour power into labour, the employment contract is necessarily complemented by

employment regulation. Workers' knowledge is a key factor in this indeterminacy. Adopting the perspective of the employment relationship makes it possible to include the strategies and agency of both management and workers in relation to knowledge in the analysis of spatial restructuring. To address these complex underlying dynamics in research, reconstructing spatial restructuring as a process serves as an appropriate research method.

In the course of developing the dimensions of the theoretical framework, several questions emerged. These essentially boil down to two central research questions. The first of these is: 'What is the relationship between changes in the spatial division of labour and changes in the technical division of labour?'. The second central question is: 'What is the relationship between specific knowledge characteristics of activities and the design, implementation and outcome of their spatial restructuring?'. By investigating spatial restructuring projects from these combined perspectives, we believe that our study contributes in several ways towards advancing knowledge of the conditions under which such events occur, and their effects. A first contribution is provided by the analysis of precisely how the different tasks in the organisational structure are spatially restructured and with what effects. This perspective complements approaches that focus on the contractual aspects of interfirm relations and on the impacts of restructuring on both contractual employment conditions and industrial relations. Secondly, we add value to the WORKS project which investigated changes in work in relation to global value chain restructuring. In our view the concept of a business function used in this project is both conceptually and empirically underdeveloped to provide sufficiently detailed descriptions and explanations of changes in the tasks and functions. Thirdly, using the STOSA analytical framework to analyse transformation processes that are organised at a distance and involve sites that do not necessarily belong to one organisation may support the theoretical and empirical validity of this approach more than its original focus on the local and internal organisation of transformation processes. A fourth contribution is that we envisage obtaining indications as to whether potential changes in the technical division of labour differ according to whether or not a change in the contractual governance mode, outsourcing, is involved.

A fifth contribution is that we expect to gain greater insights into the role of knowledge in work that is restructured. Once again the expected outcome is an improved conceptual and empirical understanding. Overall, we aim to hone our insight into the role of knowledge in the labour process and in the employment relationship. Reconstructing spatial restructuring events will bring to the surface not only the uncodified and codified dimensions of knowledge but also the way in which codification is achieved (or not) in restructuring. By focusing on knowledge utilisation by workers in a situation of restructuring, a better understanding can be gained of knowledge as a key element in indeterminacy. By focusing on management strategies and agency in relation to knowledge-related aspects of work being restructured, we hope to better understand how knowledge specificity impacts on the design, implementation and outcome of the restructuring process.

A sixth contribution is the broadening of horizons beyond the 'typical' knowledge work(ers), who seem to be preferentially addressed in these strands of research. Including less knowledge-intensive work makes it possible to investigate the utilisation of practical knowledge, as will be explained below. This extension of the research field is important in a context of dominant discourses on the knowledge-based economy. A seventh and final contribution is that the focus on strategies and agency, as already mentioned, brings in the perspective of the labour process approach. This opens up a form of analysis based on the dynamics of the employment relationship which offers a greater understanding of the mechanisms behind spatial restructuring.

3.1 A qualitative approach, explorations and explanations

3.1.1 Conditions for case study research

The complex phenomena at the core of this research lend themselves to a qualitative research approach. Investigating the complex and interlinked social realities covered by our research questions is not a matter of identifying and observing single variables and relating them in linear causal relationships. They require an open approach, focusing on understanding an event as it has unfolded and taking into consideration the conjunction of a broad range of contextual factors that are involved.

In his widely cited manual on qualitative research, Yin argues that: 'Case studies are the preferred strategy when "how" and "why" questions are being posed, when the investigator has little control over the events and when the focus is on a contemporary phenomenon within some real life context' (Yin, 1994: 1). In such research settings the role of the researcher is often an interpretative one: *i.e.* it should involve putting together the viewpoints of multiple stakeholders to gain a rounded view (Huws & Dahlmann, 2006: 13). Huws and Dahlmann typify qualitative case study research in contrast to quantitative research by means of four features. Firstly, it is holistic: the focus of the research is not on isolating the individual dimensions of a phenomenon but rather on understanding the linkages and tensions between them; the aim is to understand complexity rather than simplifying reality for the purpose of measurement. Secondly, it is based on the recognition of multiple realities: the focus is on understanding different perceptions, aspirations and interests and how these influence accounts of facts and events. Thirdly, it is heuristic, interpretative, inductive and iterative: it involves an open, evolving and more flexible research approach rather than a linear testing of single phenomena. Fourthly, it requires in-depth face-to-face field work (*ibid.*: 14). These characteristics are pertinent to the research questions that we developed.

Manuals distinguish between different types of case study research. Most typologies set out a contrast between exploratory case studies and explanatory case studies (Darke *et al.,* 1998, George & Bennet, 2004:75ff; Huws & Dahlmann, 2006). Exploratory case studies aim to investigate a new phenomenon when only some preliminary ideas on the nature of this phenomenon is available. Such cases permit a better description of the phenomenon, the development of new concepts and the identification of possible indicators and research questions to be explored further in future research. In view of this, cases are selected in an opportunistic way from a wide range of possibilities. Explanatory case studies, in contrast, set out from clear research questions derived from previous research and aim to test hypotheses. They result in scientific arguments backed by empirical data seeking to answer 'how' and 'why' questions (*ibid.*: 35). It is further emphasised that a variety of respondents are addressed and that an attempt is made to achieve similarity in procedure and more precisely in the type of respondents, between the different cases. To maximise the explanatory effect of the results, relationships between the phenomena under investigation are preferably defined in terms of the causal effects of a (range of) independent variable(s) on a (range of) dependent variable(s). Case study sampling is then based on varying the values for the independent variable on the basis of theoretical assumptions in order to explain variation in the values of the dependent variables. In the sampling process, efforts are focused on identifying the cases provided by each one to fill in the categories for the independent variable and to select those cases that are most informative (Eisenhardt, 1989: 533ff).

With regard to the different types of case studies, Huws and Dahlmann argue that in practice the dividing line between exploratory and explanatory case studies is not always clear (Huws & Dahlmann, 2006: 10). This applies to a certain extent to this study. On the one

hand there are opportunities for explanatory research in our study because some issues, such as the division of labour, are not 'new', as was demonstrated by the established literature. Further, as will be clarified below, the case study research from the WORKS project which provides the data for our study, meets the criteria set out for procedural data collection to a reasonable degree. On the other hand, the question remains as to what extent it is possible to translate the social phenomena under investigation into variables and define these as dependent and independent prior to their empirical measurement and thus to conclude on linear causalities. Instead we argue that the two central research questions are distinct by their nature, so that each one demands a specific approach.

3.1.2 A mixed approach

The first research question looks at the changes in the technical division of labour related to spatial restructuring and the relationship between these changes and functional coordination (disturbances and their regulation) and job quality. As set out in Chapter 1, the STOSA equips us with a logical, coherent and well-constructed analytical framework in order to observe the technical division of labour at different levels (the organisation, its business functions, the tasks of which these are composed, operational *versus* regulation tasks) and to derive assumptions from this on the prevalence of disturbances and on the potential for regulation. Established theories are also available for measuring the effects of changes in the technical division of labour on work. By analysing changes in the levels of functional concentration, differentiation and task specialisation and fragmentation in relation to spatial restructuring, related changes in the occurrence and regulation of disturbances and in job quality and knowledge utilisation can thus be explained. Overall, these conditions facilitate an empirical design that comes close to testing the relationship between these phenomena, based on a before-after comparison, and makes it possible to reconstruct a chain of causal events linking spatial restructuring, technical division of labour, disturbances and their regulation, job quality and knowledge utilisation.

Given the specificities of the social reality that is at stake here, however, the causality that is envisaged should be defined in a realistic way. In this respect, the critical realist approach to causal mechanisms is helpful. In critical realism, explanation means accounting for specific outcomes through consideration of causal mechanisms at work in particular contexts (Ackroyd, 2004: 152ff). The causal mechanisms that are investigated do not operate in a closed system but are influenced by a range of particular circumstances. Case studies make it possible to explore the character of causal processes in particular contexts (*ibid.*: 153ff). Due to the importance of the context for the actual outcome, the predictive capacity of the causal explanations is also assessed realistically. The real effects of spatial restructuring will depend on a range of contextual conditions. What we aim for is: 'a reasonable consistency in the empiry to suggest that a mechanism is operative' (*ibid.*). Another way of understanding the realist approach to causality is: 'the attempt to distinguish between "can" and "must", between contingency and necessity coupled with the better search for metaphors and models for representing the world, is central to theorising in social science' (Sayer, 2004: 10). This implies that the actual outcomes and effects are always contingent. Based on this approach, the critical realist scholars focus on 'retroduction' instead of generalisation, defined as the process of identifying what causal powers are active in a given situation and acknowledging that there may be several causal processes that are jointly responsible for a particular event (*ibid.*: 11).

While the theories and models of concepts that are central in our first research question may make it possible to envisage such an understanding, the second research question is

much more exploratory. The second research question was: 'What is the relationship between specific knowledge characteristics of activities and the design, implementation and outcome of their spatial restructuring?'. Furthermore we are interested in strategies and agency of management and workers with respect to knowledge utilisation in relation to spatial restructuring. Here we encounter various difficulties in the case of a cause-effect design. Knowledge is a conceptual construct that is difficult to grasp empirically, especially when considering the ontology of knowledge as a dynamic conjunction involving both codified and tacit dimensions and evolving in concrete action and interaction. On the basis of our theoretical understanding of knowledge, it is not feasible to isolate and observe knowledge in order to measure it. Observing uncodified and codified knowledge, analysing processes of codification and detecting the emergence of new knowledge through contextualisation and improvisational work practices are all highly dynamic and context-specific realities.

Equally, attempting to observe the employment relationship as conceptualised in the labour process approach is not straightforward when we expect complex and dynamic combinations of contradictory strategies (autonomy *versus* control, collaboration *versus* resistance) and interactions. As social science concepts such phenomena are 'notoriously difficult to measure' (George & Bennet, 2004: 19). In all, this second research question requires a deep analysis with a detailed reconstruction of the restructuring process, making it possible to understand the agency of management and workers.

It has been said that a general concern for both research questions is interference from contextual conditions and factors in the restructuring process which may not be included in the theoretical framework. This is an inevitable consequence of our attempt to formulate precise research questions and to specify our research population (Eisenhardt, 1989: 536), for instance as limited to spatial restructuring events. Restructuring processes are influenced by many factors, which are often unique and several of which are beyond the scope of our research and remain unobserved. We may think first of the contractual aspects of spatial restructuring, which we will not analyse in detail, but also the local labour market and institutional regulations at the destination, the firm's wider economic environment, the power relations between different units and firms in the value chain, industrial relations settings and practices and so on, will all have an influence. Under such empirical conditions, the analysis is restricted to identifying 'contributing causes to a certain outcome' (George & Bennet, 2004: 27) based on a heuristic and iterative approach. As a consequence, the possibilities for cross-case comparability are also limited, particularly for the second research question. Comparative research requires a high level of standardisation of variables, research methods and analysis. The aim in the second set of research questions is to unravel complexity and to reach a deep understanding of complex interlinked phenomena in a context of processes of change. This endeavour is interpretative, which means that the primary focus and emphasis is on understanding the idiosyncratic nature of each single case study. Overall there is a trade-off here between the richness of within-case analysis and cross-case comparability.

In order to address the two distinct research questions, to acknowledge their specific logic and to take account of their specific data requirements, the analysis of the case study material will take place in two stages. In the first stage, an analysis of the design and implementation of spatial restructuring and its effects in terms of changes in the technical division of labour is carried out and we examine the consequences of these changes. In the second stage, we reconstruct the strategies and agency of management and workers with regard to knowledge utilisation in the labour process. This includes both a detailed investigation of how management takes account of the knowledge specificities when designing and implementing the

restructuring, and reconstructing the workers' responses in terms of contextualisation and improvisation.

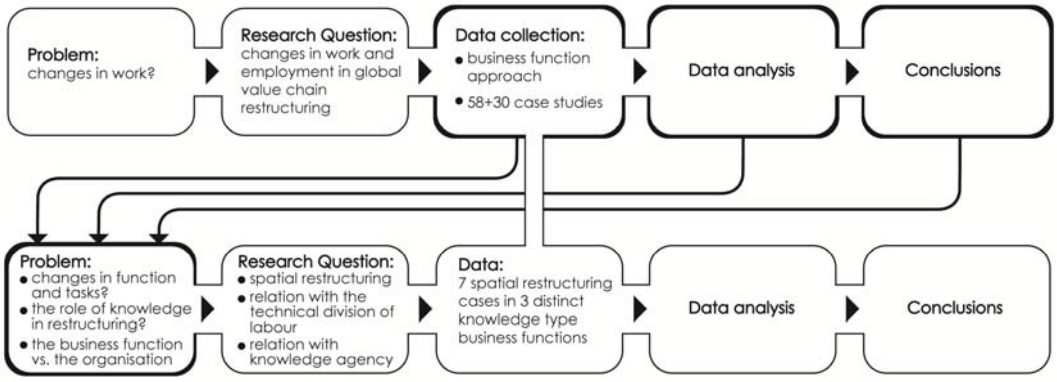
These empirical choices are decisive when it comes to case study sampling. Cases are selected because they are considered most informative in terms of theoretical perspectives and the research questions, without making any claim to generalisation. While we add new concepts into the analysis of restructuring processes for the second research question - knowledge management, knowledge utilisation, interaction and agency - the data requirements also increase. In practice, in-depth face-to-face interviews and sufficient data on both the source company and the destination company are required.

3.2 The WORKS project

3.2.1 An iterative research cycle

This study builds on the European project WORKS that was carried out between 2005 and 2009 and sought to investigate the impact of global value chain restructuring on a range of work and employment issues. As the project coordinator for this project we were actively involved in the design and implementation of all steps in this large-scale research project, making it possible to benefit from its framework, structure and outcomes for the present study. As a result, this study is not the result of a purely linear empirical design from problem to analysis, but instead is the outcome of an iterative process whereby feedback from the various research phases of WORKS was able to feed directly into a subsequent research cycle realised in our study, as shown in Figure 3.1 below. Such an iterative process is a great advantage of qualitative research.

Figure 3.1 An iterative qualitative research cycle



The WORKS project, which will be described in detail below, served as a starting point for the different research phases of our study. The theoretical literature upon which WORKS was originally built provided a strong basis for familiarisation with the theories and research in the area of global value chain restructuring. This made it possible to take up the theoretical and empirical challenges involved in using this perspective to investigate current changes in work. The empirical design of the WORKS project made it possible to test the use of the business function as an alternative unit of observation to traditional company-based or sector-based research. The large number of organisational and individual case study reports in

WORKS and the range of comparative thematic reports derived from these provided rich empirical data for analysis in view of our specific research questions. Consequently this study made it possible to build on the outcomes of WORKS, to seek to add value to the original project and to contribute towards the theoretical and empirical deepening of its rich legacy.

This added value firstly consisted of the further elaboration of some of the key theoretical concepts included in WORKS. Setting out from the initial interest in the role of knowledge in global value chain restructuring, contributions towards specifying the research questions came from the use of additional literature on offshoring and outsourcing, on organisations, on the employment relationship and on the agency of workers, as reported in the previous chapters. The original analysis of the skills impacts of global value chain restructuring created the need to achieve greater conceptual clarity on tacit, uncodified and codified knowledge and on codification processes, as well as addressing the challenge of their empirical observation. As will become clear in the fifth chapter, some case studies in particular set us on this track and encouraged us to dig deeper into the issue of knowledge. Overall, familiarity with the wide range of restructuring cases collected and analysed in WORKS also enabled us to consider the value of different theoretical approaches and to specify what was needed additionally to address our research questions.

A second source of added value was the critical assessment of the empirical approach developed in WORKS. Here our interest obviously centred on the concept of the business function, which was introduced as an important innovative tool. One concrete ambition was to address the theoretical and empirical limitations of the business function, as defined and applied as a generic concept in WORKS. These limitations became apparent in the preparation and execution of field work for WORKS, in the within-case analysis of the data and specifically in the comparative analysis of business functions within and across sectors. Particular limitations were experienced in describing the impact of value chain restructuring on work at a detailed level of technical division of labour. These limitations motivated us to look for a more fine-grained analytical scheme with more explanatory power, which resulted in the use of the STOSA. Of course, since the business function was the basis for sampling in the WORKS case studies, it necessarily continued to be the basis for sampling in our study, as will be clarified.

As regards data collection and analysis, we participated actively in data collection, analysis and case report writing in relation to three organisational and three occupational cases which are also analysed in the present study. We were further involved in the comparative analysis of the whole set of 58 case studies for two comparative thematic reports (Huws, *et al.,* 2009; Ramioul & De Vroom, 2009). As will be clarified below, the analysis for this study was based on the raw data (interview transcripts) and the case study reports. These WORKS reports do not include a detailed or in-depth analysis of the topics central to our research questions, such as detailed descriptions of the technical division of labour or an analysis of the agency of workers from the perspective of their knowledge utilisation. As a result, we carried out an additional analysis on a selection of the WORKS data from our two complementary perspectives: changes in the technical division of labour related to spatial restructuring and the agency of management and workers with respect to knowledge utilisation in labour processes in a context of restructuring.

In all, participating in the design and implementation of all stages of the WORKS project has made it possible to enhance and deepen its theoretical and empirical outcomes in our additional study.

We will now turn to a detailed description of the design of the WORKS project and of the various decisions made during its empirical phases.

3.2.2 The qualitative research within WORKS

3.2.2.1 The WORKS organisational and occupational case studies

The Work Organisation Restructuring in the Knowledge Society (WORKS) project was funded by the European Commission in 2005 under its 6th Framework Programme to investigate the changes that are taking place in the organisation of work as organisations are transformed in the context of economic globalisation. The core research interest of the project was to better understand the impacts of these changes on workers. One of the underlying assumptions of the WORKS project was that global restructuring of value chains contributes to the understanding of the reorganisation of work. The leading research question was: how are employment practices adapting to such changes and with what effect? With partners in seventeen different institutions in fourteen EU Member States, WORKS combined theoretical work and a detailed analysis of EU statistics with in-depth case studies involving organisations and individuals. The project started in June 2005 and ended in August 2009. This study will draw on the qualitative work undertaken in this project by analysing a selection of its case study data.

The design of the qualitative research within WORKS and the different decisions with respect to the case study investigations were based on the initial theoretical work done in the project, whereby comprehensive and multi-disciplinary literature reviews were carried out on the different dimensions of global value chain restructuring and its impact on work and on individuals (Huws, 2006). Based on this, the central themes of the qualitative research were (Flecker, *et al.,* 2008: 8): the networked organisation; the global division of work within the value chain; drivers of change and shaping factors (*e.g.* technological innovation, economic factors, liberalisation and rationalisation); (new) forms of work organisation, co-operation, control, autonomy, time use, learning and working conditions; impact of organisational changes on internal labour market structures, personnel policies, learning and skills; use of organisational temporal and contractual flexibility; industrial relations and participation issues; and, finally, the question of how (national and regional) institutional frameworks shape work organisation and the quality of work. Organisational and occupational case studies were set up in order to address this broad range of issues.

The organisational case studies within the WORKS project covered a number of what were defined as generic business functions and represented a variety of labour processes ranging from highly-skilled knowledge work to semi-skilled manual and administrative tasks. The consortium aimed to focus on those business functions that feature prominently in the external restructuring of companies and thus in the restructuring of global value chains. To achieve this aim, the first selection criterion was to choose a number of business functions from the generic value chain. The selected business functions were: research and development, production, logistics, customer services and information technology activities. The intention was to compare the restructuring of these business functions across a selection of sectors. A second criterion for the sampling framework therefore involved the selection of industries. This selection was designed to reflect the emergence of global value chains in different historical stages (*ibid.*: 9). Sectors were chosen where vertical disintegration and internationalisation are already long established, notably the Clothing industry and the Food industry, and sectors where these have developed only very recently, notably the IT industry, Public sector organisations and Services of general interest. This led to a basic sampling matrix of five business functions in five sectors. The third objective was to study each business function within a particular sector in a number of countries with diverse employment and welfare regimes. This was inspired by the aim of studying the influence of institutional settings on the consequences of restructuring, which was one of the core themes in

WORKS. Obviously, the fourteen countries participating in the WORKS consortium were available and were therefore included in the sampling matrix. The combination of five business functions, five sectors and fourteen countries resulted in the overall case study sampling matrix.

Given the fact that all five business functions can, in principle, be identified in the value chain for each of the five sectors, there were theoretically 25 possible cells in which to study the restructuring of business functions. For obvious reasons it was not, however, possible to undertake 350 case studies (25 cells studied in 14 countries). To begin with, budgetary and time restrictions limited the number to three to four case studies per institute (with 17 institutes involved in the project in total), resulting in a total of 58 cases. It was consequently necessary to make some choices in order to maximise relevant new knowledge and comparability with a limited budget. It was decided to select those business functions within the sectors that were legitimately assumed to be the core functions and to be under particular pressure of being restructured (relocated and/or outsourced). These assumptions were made on the basis of existing literature, previous research by the consortium partners and their familiarity with specific sectors. In Clothing, for example, it was assumed that design, production and logistics were three core functions under high pressure to be restructured; in the IT sector, the focus was on R&D and software programming (production), rather than on logistics or the internal IT helpdesks (IT function), in Public sector administrations, it was customer services (rather than logistics) that was considered to be most relevant for the study, etc. In addition, ptrevious research experiences and the partners' privileged contacts with particular stakeholders in the sector were taken into consideration in the final selection for reasons of efficiency and to optimise the chances of success in accessing the companies. By limiting the number of business functions to be studied in each sector, the overall comparability of the research was also enhanced because more case studies (countries) could then be added into each of the selected cells, rather than distributing 14 countries over 25 cells.

Another advantage of this selection procedure was that since the level of observation was the business function and not the company, it was possible to carry out two different business function case studies in one company. This yielded some important efficiency benefits, for example when negotiating access, collecting basic company information and in the practical organisation of the interviews. It also made it possible to investigate the relations between the business functions in the value chain as they are organised in one company. For a number of cases it was possible to complement the case study with interviews at the destination company, depending on acces and resources. This made it possible to collect additional information on the outcome of restructuring. A total of 58 case studies were conducted between January 2006 and May 2007. The following matrix depicts the distribution of the organisational case study sample across the different participating national teams.

Table 3.1 Sample of WORKS organisational case studies

	R&D/Design	Production	Logistics	Customer services	IT function
Textiles/Clothing	BE; FR; DE; PT; IT	BE; IT; PT; HU; GR	FR; DE; NL; PT; HU		
Food		GR; BG; IT; NO; DK; UK	BE; NO; BG; GR; NL; UK		
IT sector	DE; AT; UK; BE; FR; NO	DE; AT; HU; BG; SE			
Public Sector Administration				AT; BE; BG; HU; IT; UK; SE	BE; NL; UK; FR; DE; NO; SE; PT
Services of General Interest: Post and Rail				DE; AT; SW; NL; GR	

The unit of analysis for the WORKS case studies was the restructuring of a business function that involved either a contractual (outsourcing) or a geographical (offshored or domestic) change or a combination of both. The key criterion for the selection of case studies was a restructuring event that had been initiated a maximum of five years earlier, *i.e.* not before 2002. For the selection of restructuring events in the assigned industries, the national research teams used public information such as newspaper articles or information from magazines and specialised press in the specific industry, and several contacts with sectoral stakeholders, mostly employer organisations and unions. Before the selection was finalised and contacts were established with the organisation, the case studies proposed by the different teams were intensively discussed during a two-day consortium meeting while the final decision was taken by the scientific board of WORKS with the aim of being certain that all the sampling criteria were met.

The organisational case studies were complemented by case studies designed to investigate the impacts of changes at work on individuals. These occupational case studies were closely related to the organisational case studies. Workers were selected within specific occupational groups linked to the key business functions. Six occupational groups were selected: designers in the Clothing industry; researchers in Information and communication technology; IT professionals in Software services; production workers in Food or Clothing; logistics workers in Food or Clothing and front-office employees in customer relations in Public services. In each occupational group, three to seven case studies, each involving seven to nine interviews with workers, were conducted in different countries, covering a variety of socio-economic and institutional contexts. Thirty of these occupational case studies were carried out in fourteen countries between June 2006 and May 2007.

3.2.2.2 Organisation, analysis and reporting of the case study research

The semi-structured interview guidelines for each set of case studies, included in the Annex 1, were prepared by two coordinating teams, one for organisational and the other for occupational research, supplemented by other consortium partners with considerable experience in international comparative case study research in organisations and involving individuals. Training was given covering the core research issues, access negotiation strategy, selection of respondents, the semi-structured questionnaires, the interview guidelines and the standardised case study report format in a second three-day training seminar that was set up for all the WORKS field researchers involved. Eight to ten interviews were conducted for each of the 58 organisational and 30 occupational case studies. The list of respondents was

specified in advance and included, for the organisation case studies: the general management and management of the selected business function, several key employees in the business function and employee representatives. The interviews were complemented by company documents and other material that made it possible to produce a comprehensive picture of the restructuring process. For the occupational case studies, each case study relied on seven to nine in-depth individual interviews with employees directly involved in the restructuring process. Researchers in the respective countries constructed the individual case studies from interview field notes, recordings and transcripts in standardised report formats and used a fact sheet to synthesise the basic data for each case.

Overall, the teams had a total of approximately one year to complete all their allocated organisational case studies and one year for all their allocated occupational case studies. As a rule, one month of research time was dedicated to each case study.

Generally speaking there was a key difference between the approach to organisational and occupational case studies. In the former, respondents were selected as representatives of the organisation (or more precisely: its business function under observation) who would be able to report to the researchers the facts in relation to the restructuring process, how it developed, what actions and strategies were deployed, what outcome was achieved, and so on. The organisational case study investigation can be described as an iterative process between data collection and data analysis, leading to a gradual filling in of all the information on the different research topics, with ongoing assessment of whether and, if so, what additional information was still required. In the occupational case studies, the interviews were in a narrative form, with a focus on the experiences, perspectives and interpretations of the employees and how they were personally affected by restructuring. One might describe the two approaches as a more realistic *versus* a more constructivist approach.

Both coordinating WORKS teams closely followed the progress of the work and used checklists with quality criteria before a case study was considered to meet the quality standards and before it could be concluded. On the basis of the individual case study reports and also the basic fact sheets on the cases that were provided by the field researchers, detailed feedback was given by the teams in charge of coordination in order to identify missing information, point out inconsistencies or vagueness in the case and in the case study report and ask for additional clarifications and data if needed. This might mean the researchers having to return to the field.

The number of case studies, 58 + 30, required a three-stage analysis and reporting process. First, the individual research team used their field notes, recordings and transcripts to construct single case study reports using a common format (included in Annex 2). While the overall objective of the WORKS project was shared between the researchers in the preceding phases of the project, the leading research question was formulated rather broadly as 'changes in work related to global value chain restructuring'. This was complemented by the range of themes, listed earlier and set out in the semi-structured interview guidelines. These themes also had to be covered in the individual case study reports. As a result, each single case analysis was an inductive process, aimed at constructing a logical and plausible account of the restructuring process and its effects. Thanks to careful process-tracing and the use of multiple sources and respondents for one case, it was generally possible in each case study report to uncover the process dynamics of the restructuring event.

In a second step, comparative analyses were carried out on the basis of the full set of case study reports to produce two synthetic reports. One report was based on a comparative analysis of the cases in each of the five sectors. This allowed the restructuring events of a number of business functions to be integrated to better understand the overall logic of global value chain restructuring (Flecker *et al.,* 2008). Given the fact that the unit of observation and

analysis was a specific restructuring event involving a specific business function, which was often only a small unit in the firm, there was initially a high degree of idiosyncrasy in the cases. This was related to the sector-specific and organisation-specific nature of the business functions and their restructuring. From the comparative analysis, it appeared that similarities between the case studies could nevertheless be related to specific sectoral dynamics and it was possible to discern sector-specific patterns of change. Overall, a sector-based approach was assessed as being more feasible than a cross-sector business function comparison. In other words, it appeared that, contrary to the expectations, the business function approach did not specifically contribute to facilitating cross-sectoral and cross-country comparative analysis. Rather it appeared that restructurings should be explained by the interplay of national institutional regime characteristics, sectoral dynamics as well as company and business function specificities (Flecker *et al.,* 2008; Meil, 2009). This conclusion confirmed the limits of the business functions concept as a generic concept applicable in different sectoral settings and one of the reasons for this study was to reflect on the empirical use of that concept.

The second comparative report analysed the occupational interview data gathered under three different occupational groups: knowledge workers, blue-collar workers and customer services workers (Valenduc *et al.,* 2008). Both key publications were based on the original case study reports complemented by iterative feedback and intensive discussions with the field researchers.

Thirdly, different international teams drafted a series of 11 thematic reports, in which all the empirical data from the WORKS project were integrated and re-analysed from different thematic perspectives relevant to the overall project objectives. The themes of these reports are: Global value chain restructuring in Europe (Huws *et al.,* 2009); Changes in work organisation and representation at the workplace (Meil *et al.,* 2009); Strategies to reach flexibility (Flecker *et al.,* 2009); Global value chain restructuring and the use of knowledge and skills (Ramioul & De Vroom, 2009); Changing career and trajectories (Valenduc *et al.,* 2009); Changing gender and ethnic relations in the workplace (Huws *et al.,* 2009); Working time, gender and work-life balance; (Krings *et al.,* 2009); Change processes and methodologies of future perspectives on work (Moniz *et al.,* 2009); Changes in work in transformation economies (Makó *et al.,* 2009); Impact of restructuring on psychosocial risks (Di Nunzio *et al.,* 2009) and The role of technology in value chain restructuring (Greenan *et al.,* 2009). The original case study reports remained available for all consortium members and additional checks and questions for clarification with the research teams were provided. The way the data were used, the conclusions and the interpretations were verified and validated by the research teams coordinating the qualitative research before any report was formally released for publication.

All these steps and procedures were fundamental to the 'risk management' of the WORKS project, which is particularly important in qualitative research in an international context (Huws & Dahlmann, 2006: 29).

3.2.3 Uniformity and quality control in an international research context

Since WORKS was an international research project, involving seventeen research institutes from fourteen different EU Member States and approximately forty researchers in all, the development of stringent research procedures and protocols for each step in the case study research was a prerequisite for ensuring common standards and safeguarding the overall quality of the research. These included detailed descriptions of project objectives, research questions, field procedures and guidelines for analysis and reporting, as has been made clear.

From the start, the project consortium made considerable and ongoing investments in ensuring awareness of cultural and language differences and providing a basis for a common understanding of all aspects of the project. This meant, for instance, using a common core bibliography and constructing a comprehensive project glossary spelling out all the concepts and terminology used in the project. This glossary was constructed through a collective, iterative process, involving all researchers, before starting the empirical phases of the project and was made accessible on the project's website (www.worksproject.be). Other strategies included building mixed subteams that varied for the different research tasks, scheduling internal peer review for all publications, specifically with the aim of bringing to the fore nationally or institutionally specific understandings of concepts (for instance: concepts such as works councils, VET systems, fixed employment contracts, etc.) and setting up and maintaining a variety of communication and decision-making strategies.

In the context of a large international research project, bringing together researchers from very different countries, research traditions and practices, such a description of research procedures is necessary in order to acknowledge the constraints on the data used in this study. Overall, there are still some drawbacks to such an international comparative research design. Working in an international context means that one can never completely rule out the effect of cultural bias during the research process. Language differences and differences between the research teams which may be deeper and more complex cannot be made fully explicit. The strict procedures and checks (such as joint training sessions, guidelines, quality controls, iterative feedback processes) that were applied during the project were crucial in order to overcome these where possible. Nevertheless, there remains a relative lack of control over the way in which access was negotiated, respondents chosen, interviews conducted and data interpreted by the field researchers. Quality control activity chiefly targeted the quality of the information collected and how it was reported in the common report format. The possibility of bias may be more acute in for the occupational case studies, where the respondents were interviewed in a narrative way about their individual experiences, careers and occupational identities, while in the companies the focus was on structures and strategies. As will be explained below, it has been decided to use the organisation case studies, and preferentially those carried out at our institute.

On the other hand, there are also indisputable advantages of conducting research in an international team and in our view these outweigh the disadvantages that have been mentioned. Firstly, it has been possible to bring together the knowledge of a large group of almost forty researchers from seventeen different research teams, who are all acknowledged to be experts in the key research issues covered by WORKS. This broad base of expertise included not only theoretical knowledge but also long-standing experience of conducting case study research and, for most of the partners, experience in international collaborative projects. The intense discussions within such a group were therefore extremely fruitful and went well beyond what can normally be reached for in a small national team, in terms of both quantity and quality, variety and the richness of the discussions and reflections. Such a 'multiple investigators' design has advantages for case study research, as the literature emphasises (Eisenhardt, 1989: 538, Huws & Dahlmann, 2006).

A second clear advantage is that conducting such a large number of case studies, amounting to 58 different in-depth restructuring cases, is seldom feasible or affordable for any national research project. For all participating countries, and especially for the smaller regions such as Flanders, the number of potential restructuring cases fitting the criteria would have been much more restricted, not only in relation to the selected business functions and industries but overall. The preliminary investigations to find the suitable restructuring cases assigned to each team were generally comprehensive. In addition, failure to

negotiate access, which turned out to be a significant issue given the delicate subject of restructuring, further ruled out some candidate cases. Except perhaps for the largest countries, constructing purely national sampling frameworks to fit the sampling matrix would have been a problem. Selection bias would thus also have arisen in a single country design.

Thirdly, the robust work done on the empirical data from all the case studies by the different teams significantly facilitated case selection for the purpose of our (and possible other WORKS-related) research questions. Alongside the standardised case study report structure, all cases were analysed from a comparative perspective by the two teams in charge of the coordination, through close interaction with the respective field workers. This made it possible to carry out an additional quality control on the original data, and also to identify national and cultural specificities (for instance on institutional and regulatory contexts in some sectors). This cross-comparative analysis made it possible to elevate the cases to a more aggregated level, thus contributing to a better understanding of the concepts, mechanism and processes used in the theoretical framework of WORKS. Finally, the collaboration and procedures facilitated access to the data beyond the period covered by WORKS itself. As a result it is possible to go back to the original material of the case studies and to consult the different partners involved to obtain feedback on the use of the data without having to revisit the companies.

3.2.4 Implications for the empirical design and some reflections

The analysis of the qualitative data from WORKS in this study has some specific consequences. The first of these concerns the limited opportunities to adapt the case study selection to our specific research project. The WORKS sampling matrix combined a limited number of business functions and industries and these were distributed across the participating countries. This means, for instance, that there is no Belgian case on production in the Food sector (while there is one on logistics in Food). Our institute also did not investigate restructuring in the IT sector, in Public services or in Services of general interest but only in the Clothing and Food sectors, two industries that are generally characterised as having low knowledge-intensiveness. The advantage of the WORKS context is, on the other hand, that a choice of restructurings could be made out of a wide range of possible cases, including those business functions and sectors which we did not originally investigate, which meant that the aim of a theory-driven selection of the most informative case was achievable. While not all WORKS cases qualified for our analysis, this still meant that we could make use of relevant organisational case study reports that would never have been accessible without the research facilities and structure of WORKS.

Secondly, as has already been made clear, WORKS opted to use business functions as a window on the restructuring of global value chains. While it was not the objective of the project to map entire global value chains, which would have been a fairly ambitious research endeavour and difficult to achieve within the scope of the project, the business function approach provided a promising way to investigate how work is organised across a firm's contractual and spatial boundaries. We refer here to the first chapter of our study where this choice was substantiated in detail. The theoretical assessment of the business function concept that was meanwhile being carried out in our study, and the limits of the concept that were identified, obviously could not be considered in the design of our study since the project was well advanced by the time our study had started.

Third, working within WORKS also meant that we inevitably had the actual WORKS cases in mind when designing our study since we participated actively in both data collection and comparative analysis. This does not, however, mean that the cases for our analysis are

selected based on the outcome of the restructuring process, which would imply a selection bias. As will be made clear, the selection of cases was initially based not on the raw data but on the aggregate case study reports. These reports do not include a detailed and in-depth analysis of the central topics of our research questions, such as the detailed description of the technical division of labour with the help of the STOSA terminology or the analysis of worker agency from the perspective of knowledge utilisation by workers. Especially for the latter analysis the original interview transcripts were indispensable. In this respect, we had to be aware from the start that no additional data collection was possible and that consequently data saturation was by definition not ensured for this specific issue. The differences in depth between WORKS and our study mean that there is information in the case studies that may turn out to be irrelevant, which requires some 'data reduction', while at the same time data may be missing that would be required for a fully justified empirical observation of the concepts and relationships addressed by us.

Overall we can still conclude that the research context of WORKS and the availability of this large fund of empirical data was an advantage rather than a limitation because they contributed towards the process of honing the various key concepts that are used in this study. Further, sampling out of the broader WORKS case study set became an achievable objective.

With respect to the data, as has already been mentioned it should be emphasised that at the stage of the WORKS analysis and also at the beginning of this study we only had the various organisational and occupational case study reports at our disposal and not the interview transcripts held by the national teams. The series of comparative thematic analyses in WORKS are based on the case study reports. These case study reports have a common structure, ordering all interview data in a systematic, descriptive way according to the issues of interest to WORKS (see Annex 2). Each report is about 25-30 pages long and where possible includes relevant company documentation in annexes. This means that it was necessary to request the interview transcripts from the respective research team for the selected cases not carried out at our institute because we aimed to analyse the raw data from other research institutes.

In this respect, it is not necessarily considered problematic that we were not personally involved in these interviews, because this permitted us to look at the data from a different perspective while being less immersed, and to develop a different and more distant perspective (Eisenhardt, 1989: 538). We found that this advantage also applied to the case studies carried out at our institute because the time lag between the WORKS project and the analysis for this study (approximately one year) created sufficient distance for a fresh interpretation of the interview transcripts from the focused perspective of our two research questions.

On the other hand, the desire to access the interview transcripts obviously limited our sample to interviews conducted in an accessible language (Dutch, French, German and English), as will be further explained below. Moreover, it was difficult to assess in advance to what extent additional relevant data would be available from the interviews beyond what was integrated in the case reports. The final selection of the cases for the second research question could only take place on the basis of the quantity and quality of the interview transcripts and the level of detail of the information relating to our core concepts, which could only be done once we had access to these transcripts.

It is useful at this point to reflect on the pros and cons of the use of transcripts in research projects carried out by different institutes. On the one hand, transcribing recorded interviews is a costly affair, and the investment is often not justified if the researcher responsible for writing up the case study report is closely involved in the field work and additional analysis by others is not envisaged. Especially for the company case studies of WORKS, in contrast

to the occupational case studies, the emphasis was on collecting mostly factual data with a view to reconstructing the restructuring event. Such a reconstruction does not necessarily rely on the in-depth analysis of long quotations or the expression of perceptions and meanings, which was more pertinent in the occupational case studies. On the other hand, as we discovered, the availability of interview transcripts is certainly a great advantage when additional analysis of the data is envisaged, especially if this is to be done by other researchers or research teams. While the quality of the case study reports was generally more than sufficient to provide a deep and comprehensive insight into the restructuring case, the use of the interview transcripts made it possible to carry out a different and complementary analysis and to shift the emphasis to the issues central to our own research questions (task composition, knowledge utilisation, agency, etc.). Writing up 'another' case study report on the basis of the same set of interview transcripts was also found to be an interesting process by the team that originally carried out the interviews. In international research projects, such as WORKS, the use of transcripts by other research teams is, of course, limited by the languages used and is thus dependent on the command of those languages by the research teams. The actual use of the original data by other research teams in the WORKS consortium could not be estimated in advance because this was dependent on additional local funding. That was also the reason why the teams were not committed to using common qualitative analysis programmes when writing up the various case study reports.

A final point concerned the intellectual property rights over the WORKS data. In this respect, the WORKS consortium was able to rely on the establishment of a Consortium Agreement as well as on additional and detailed agreements between the partners, prepared by the scientific board and endorsed by the general assembly. These agreements were based on priority rules for the use of the data, obligations to acquire permission and provide information and transparency concerning the use of the data collected by other research teams, centralisation of dissemination efforts and rules concerning references and citations from the authors.

3.3 Selecting spatial restructuring events

3.3.1 A theory-driven selection of restructuring projects

As set out in the first chapter, we opted not to carry out a firm *a priori* selection of the type of activities that are relocated. A large number of recent studies on offshoring and outsourcing specifically deal with ICT-enabled business services, in view of the role of ICTs in the recent rapid growth in relocations. For the empirical phase of this study, the activities are instead primarily selected based on theoretical arguments, more specifically the distinction between the different knowledge characteristics of activities. This theory-driven selection is nevertheless restricted by the decisions taken in WORKS and therefore only business functions and sectors selected in the WORKS sampling framework could be included. This selection criterion made it possible to investigate the relationship with the design and implementation of spatial restructuring and with the strategies and agency of management and workers.

The theoretical insights into the nature of knowledge developed in Chapter 2 and the range of empirical studies explored suggest that spatial restructuring is likely to be based on the distinction and separation between tasks relying on knowledge that can be transferred and knowledge that cannot be transferred because it is complex, collaborative, involves human interaction, or is otherwise sticky. More concretely, knowledge-intensity and interaction

requirements were identified as two essential task characteristics that must be taken into account when organising work remotely. It was also concluded that each of these job types has a dividing line based on the extent to which the activities rely on (un-)codified knowledge. This means that it is difficult to define the generic knowledge characteristics of jobs. In contrast, the extent to which specific knowledge requirements will actually hamper or facilitate spatial restructuring is a dynamic rather than an absolute dividing line. It was also emphasised that knowledge requirements of activities are contingent on the organisational structure. While it is not possible to identify in advance the specific organisational context of certain activities as a selection criterion for our empirical investigation, it is however feasible to identify different types of work and select restructuring cases on that basis.

Based on the conclusions of the second chapter, we identified three types of work that can be characterised by different forms of knowledge utilisation. The first type concerns less knowledge-intensive work which is based on knowledge that is largely codified. The second type concerns work where social interaction is particularly essential for contextualisation, for example in customer services. A third type is work requiring knowledge that is complex and requires collaboration and systematic exchange as a prominent feature.

3.3.1.1 Practical knowledge in standardised labour processes

From the range of studies looked at in the second chapter, it emerged that there seems to be an inclination towards knowledge-intensive work when the role of knowledge in the organisation is considered. Nevertheless, the various theories are quite clear about the role of tacit knowledge as a key component in day-to-day work and they acknowledge that it has effects on how the work is eventually done. Indeed there is little support for any assumption that elements of practical knowledge (Hirsch-Kreinsen, 2006), noncanonical knowledge (Brown & Duguid, 1991), informal work (*ibid.*; labour process approach), polymorphic actions (Collins, 2007), knowhow and know who (Johnson, Lorenz & Lundvall, 2002), etc. do not come into play in all human work, regardless of its complexity or required skills-level.

On this basis, it is relevant to investigate the role of the practical application of knowledge in work that may generally be characterised as being less knowledge-intensive and standardised and which is, in other words, based to an important extent on codified knowledge. In such types of work, the level of codification and standardisation of products and processes achieved helps to explain why certain industries have a more developed international division of labour than others, for instance manufacturing firms in the Automotive or Clothing industry, as contrasted to IT Consultancy or Personal Services. These activities can more easily be outsourced and relocated because their largely codified knowledge is relatively accessible to other firms and regions. Here, at least from the knowledge perspective, not much seems to stand in the way of relocation.

A choice was therefore initially made to select spatial restructuring projects in which work can be characterised as less knowledge-intensive, by including 'least-likely cases', in the sense that relocation is expected *not* to be limited by knowledge restrictions. The main benefit of doing this is to investigate how spatial restructuring will lead to a loss of so-called practical knowledge. This type is also of relevance because improvisational work practices and contextualisation may be less likely to be formally included in the task description and accordingly recognised or valued. This may provide interesting insights into workers' behaviour.

3.3.1.2 Face-to-face interaction in customer services work

When investigating work in this specific realm of knowledge utilisation, the focus is on social interaction with customers in individual customer services relations. The variety of customer services, the central role of social interaction in contextualisation and the degrees of codifi-

cation and codifiability in service work, make customer services a relevant type for this study. Obviously, 'uno acto' activities are *a priori* ruled out for spatial restructuring and are thus given no further consideration. Apart from this type of customer services, however, there is a still quite broad range of more or less complex service requests for advice, consultation and intervention. Based on the literature, we assume that conditions involving frequent, intense, more personal and longer social interactions, facilitating the required contextualisation of the customer question, will be likely to be best dealt with through face-to-face interaction and will therefore be more difficult to relocate. Encounter-type service questions, in contrast, are more easily codified, standardised and steered by scripts and technologies and may more easily qualify for geographical shifts. In this respect, they are similar to the first type of activities selected for our study. We might therefore again expect on theoretical grounds that specific types of employee behaviour will come into play to provide the necessary contextualisation and improvisation.

3.3.1.3 Sticky knowledge in distributed processes

A third type of work where knowledge plays a particular role was identified in Chapter 2: workplaces where the knowledge that has to be combined in order to carry out the work is dispersed and at the same time too complex or vast to bring spatially together. Consequently the work has to move back and forth to where the knowledge is located. The knowledge is bound to a specific location and/or to its employees due to its specific characteristics. Employees thus have to collaborate over distance and work evolves in an iterative process between these two points. Explicit measures have to be introduced to establish the required contextualisation and iterations in the knowledge sharing, as well as to functionally coordinate the distributed work. Distributed knowledge is the result of management decisions, for instance on setting up joint innovation projects, on the distribution of skills and resources across different organisations, on outsourcing of specific complex parts requiring specific skills or technical infrastructures, and so on. Collaboration has to take place in virtual or distributed teams to realise dedicated projects according to a predefined timeframe, but long-term and systematic remote interaction may also be required. In order to establish remote collaboration, the studies concerned emphasised that one key issue involves the establishment of conditions for social interaction that facilitate knowledge exchange and contextualisation. Where interaction between employees has to be frequent and intense and where it is difficult to standardise work roles and communication flows, spatial restructuring may necessitate explicit organisational, technical and human resources related interventions to bridge the distance. The studies reviewed showed that these may be diverse, which makes this type of work an interesting case.

3.3.2 Sampling

This study is a specific project situated within the larger WORKS project and used part of the collected WORKS data in its analysis. Consequently, the reduced sample in our study is essentially similar to the original WORKS sample, although it is more limited. In WORKS, 'a case' constituted the restructuring of a specific business function as the unit of observation, occurring between 2002 and 2007 and representing a larger class of cases by a combination of the three variables in the sampling matrix: business function, sector and country. Our study, however, is more limited in its research scope in that it only looks at spatial restructuring and its research questions are theoretically and empirically more closely defined. In WORKS, the analysis was approached broadly as 'changes in work related to the restructuring of global value chains'. Due to our specific focus, the case selection is not random but

includes the theoretically most informative cases. Subsequent decisions were therefore made to construct the sampling framework.

Starting with our first research question, only cases that involved spatial restructuring qualified. In WORKS, the object of research was global value chain restructuring, understood as 'a contractual and/or geographical change of the organisation's business functions'. In our study, the universe was restricted to spatial moves made to reinforce the external validity of our analysis (Eisenhardt, 1989: 537). This difference meant first filtering out six WORKS case studies where the restructuring involved a change in the economic governance mode only. These cases in fact concerned the privatisation of Public administration or Services of general interest. Based on a re-reading of all the remaining case study reports, it was then decided to remove all (but one) WORKS cases concerning the business function research and development because in this business function the restructuring processes studied did not involve restructuring over a distance. Most of these cases focused on collaboration between R&D spin-offs and industry (for example in the IT sector) or on the situation of (independent) designers in clothing, rather than on spatial restructuring of work. As a result, a further ten cases were omitted. One exception was a Belgian clothing case where both the Production and Development unit were jointly restructured. All of the remaining 42 cases met the spatial restructuring criterion.

A pragmatic argument further reduced the sampling framework, especially in view of the stricter data requirements for our second research question: priority was given to cases carried out in an accessible language because of the desire to use the interview transcripts. As a result, we retained cases in Dutch, German, English or French, and excluded Hungarian, Norwegian, Swedish, Greek, Italian, Portuguese, Danish and Bulgarian cases. Nevertheless, several such cases were found to be highly relevant and informative. The information on these case study reports was therefore systemised in order to keep open the possibility of using that material in the first stage analysis. The selection by language resulted in a restricted set of nineteen case studies, depicted in Table 3.2. The nickname acronyms as used in WORKS are included. The table also shows the companies in which two different business functions were investigated.

Table 3.2 Reduced sample framework of WORKS case studies

Business function/sector	R&D/Design	Production	Logistics	Customer services	IT-business function
Clothing	- WONDERWEAR (BE-HIVA*)	- WONDERWEAR (BE-HIVA)	- ADELE (FR) - ECOCLOTHING (GE) - TROUSERS (GE) - GEISHA (NL)		
Food		- MALTCO (UK)	- FOODLOG (BE-HIVA) - FOODNL (NL)		
IT sector		- MESSENGER (AT) - BUSINESS SOFTWARE (GE)			
Public Sector Administration				- CITYLIFE-MULTICALL (AT) - EWA (BE-FTU)	- ITPRO (BE-FTU*) - CITYCOUNCIL (AT) - CONSULTING (UK) - SPINOFF (UK) - EASTTOWN-GBA (NL)
Services of General Interest				- POSTPARTNER (AT)	

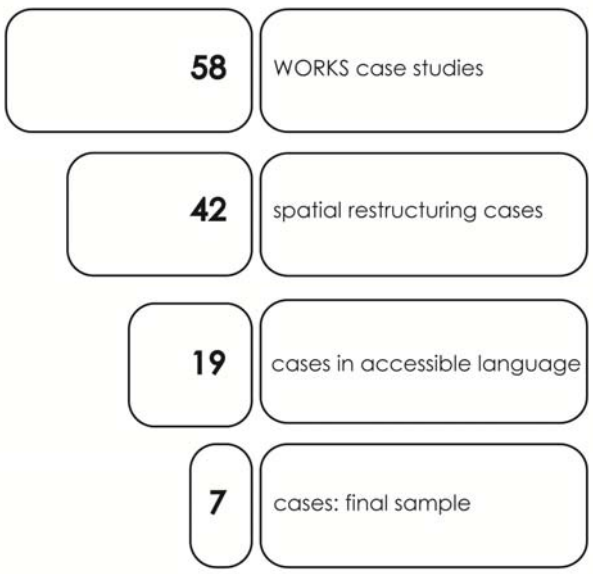
* BE-HIVA: Belgium HIVA team (Flanders); BE-FTU: Belgium FTU team (Wallonia)

For WORKS, the construction of the sampling framework deliberately included cases ranging from highly-skilled knowledge work to semi-skilled tasks. This original choice was also useful for our study because it allowed work to be selected where distinct knowledge requirements come into play. Using the WORKS sampling framework, it was possible to select the most informative cases of spatial restructuring events in each of the three identified classes. By adhering to the three distinct types we included on the one hand most-likely cases, the knowledge-intensive and the interactive type, because we assumed that in such work knowledge will hamper spatial restructuring particularly strongly. With restructuring events involving semi-skilled, less knowledge-intensive work, we added least-likely cases because for this type of work it is assumed that 'non-transferable' knowledge is not expected to stand in the way of relocation. In this way we aimed to extend existing research that tends to focus on knowledge-intensive work, as in relation to the wide range of studies on offshoring and outsourcing of IT activities.

This process of theoretical sampling from the WORKS set thus made it possible to fill in our predefined categories. In the WORKS cases, the business functions logistics and production in the Food sector and the Clothing sector qualified, in principle, as less knowledge intensive work and included ten cases in the reduced sample (rising to eleven if the two business functions of the Belgian clothing company are counted). It transpired, however, that the logistics of one Food company concerned the restructuring of tasks carried out by high-level management staff and therefore did not qualify. As a result, this case was no longer included. There were also three cases that concerned customer services activities, specifically Public administration and Services of general interest sectors. For the third type, software production in the IT sector and the IT business function in Public administration were feasible. As concluded in Chapter 2, the IT sector is considered emblematic of the kind of complex work requiring specific coordination efforts in case of spatial dispersion. Here, five cases in the reduced sample set were potentially useful.

The following diagram synthesises the sample selection from the original WORKS set.

Figure 3.2 Constructing the sample



In order to proceed, all nineteen case study reports were systematically scrutinised and classified in order to assess the data requirements more thoroughly. This made it possible to choose those case studies that were most informative for each type. Although most of the issues of interest to us were covered by the WORKS standardised interview and reporting template, it could not be taken for granted that the data quality was sufficient for the purposes of this study. The specific data requirements for the two research questions were therefore evaluated. This included an assessment of the availability of information in the case study reports on the core themes, sufficient information at both source and destination and a check on the accessibility of the interview transcripts. In order to reconstruct a restructuring case, sufficient information was needed on the background of the organisation, on the drivers of the restructuring process and on the design and implementation of the restructuring process. For the first stage in the analysis, focusing on the relationship between spatial restructuring and changes in the technical division of labour, information was required to apply the analytical categories of the STOSA. At this stage, an additional pragmatic criterion was applied: where several cases qualified and could be regarded as equivalents, we gave priority to cases carried out at our institute. In addition to efficiency reasons, direct access to the interview transcripts and the minimal risk of interpretation mistakes, control over the way the case study was carried out is also maximised and the risks of cultural bias are eliminated. Since all case study reports are written in English, however, the complete set of case study reports still remained an important reference source for the first stage analysis. As a result, one very informative Norwegian case was added to the final sample.

Concerning the number of case studies, the aim was to reconcile theoretical and empirical saturation and a feasible number of cases for in-depth analysis, with opportunities for comparative analysis, at least for the first stage analysis. It was therefore decided to select two cases per knowledge category, bringing the minimal overall sample size to six. Some authors, such as Eisenhardt (1989: 537), assert that a number of cases between four and ten should be both adequate and practically feasible. In order to achieve this number and select two cases per category, it was decided to add yet one additional case to the sample from a predecessor project of WORKS. It concerns a Belgian case study carried out in the context of the European project EMERGENCE (www.emergence.nu) which investigated changes in the relocation of telemediated activities, as described in Chapter 1. In several ways the WORKS project has built on the legacy of EMERGENCE. Not only was the core theme of EMERGENCE close to the core theme of WORKS, but the latter also inherited the former's strict data collection procedures and quality standards. In addition, several of the WORKS partners had previously collaborated in EMERGENCE and were thus familiar with the research methods. Since we were directly involved in the case studies of EMERGENCE concerning the relocation of telemediated work, the quality of the data of a particularly informative and relevant case study for our analysis was assessed and, on this basis, included in the sample. This EMERGENCE case, nicknamed CREDITCARD, provides a clear-cut second case on the spatial restructuring of customer services activity and contained more detailed data on the changes in the work organisation induced by the restructuring than the 'equivalent' Swedish (post partner) and Walloon (EWA) cases of this particular cell in the WORKS sample.

The selection process was complete once it was felt that theoretical saturation was reached, which meant that adding further cases would add too little additional insight. Overall, seven case studies were selected for the first stage analysis. This final sample is depicted in Table 3.3.

Table 3.3 Final case study sample

	Less knowledge-intensive work	Customer services	Knowledge-intensive work (IT)
Clothing (production)	- WONDERWEAR (BE-HIVA)		
Food (logistics)	- FOODLOG (BE-HIVA)		
IT sector		- CREDITCARD (EMERGENCE CASE BE-HIVA)	- IT HEALTH (NO) - MESSENGER – DIGIT (AT)
Public Sector Administration		- CITYLIFE-MULTICALL (AT)	- EASTTOWN-GBA (NL)

FOODLOG concerns a Benelux multinational beverage company where the administrative logistics, the processing of orders for beverages for export to subsidiaries, is relocated to a new established Business Shared Services Centre. WONDERWEAR concerns the relocation to subsidiaries and subcontractors of mass production in a Belgian clothing company. IT HEALTH describes the spatial restructuring of the IT units of nine Norwegian health centres. CITYLIFE-MULTICALL is about the restructuring of an Austrian public citizen's service for tenants of public flats, which involved relocating part of the customer services work to a call centre. CREDITCARD involves the relocation of the back-office of the debt collection unit of a Belgian credit card company subsidiary. Two further cases describe spatial distance in software production. In the first case, a software development unit DIGIT was the destination company of software development unit of the Austrian MESSENGER and operated as a fully dependent remote operative unit. The second case, EASTTOWN-GBA, concerns the outsourcing and relocation of IT activities in relation to the citizen's service to a specialised IT service provider in the Netherlands.

In view of the second stage in the analysis, these cases were then evaluated based on the availability of sufficient data on strategies concerning the management of knowledge and on the agency of workers during and after the restructuring process. To this end, the interview transcripts were requested from the respective national teams, except for the Norwegian case. For this second stage, only two cases, one Benelux (FOODLOG) and one Austrian (CITYLIFE-MULTICALL), provide sufficiently high quality interview transcripts and detailed data on the agency of workers. For MESSENGER-DIGIT the interview data contained too limited information on knowledge strategies of the employees (such as on improvisational work practices). In other cases, the transcripts were not accessible or of inferior quality when assessed against our needs (EASTTOWN-GBA, CREDITCARD). The detailed analysis of WONDERWEAR, which could have been a second case on less knowledge-intensive work, was found not to provide sufficient additional value to the analysis to carry out a similar detailed reconstructing as for FOODLOG. Overall, however, even where detailed information was limited, data from the other cases were added to the analysis where possible if contributing to and strengthening the conclusions.

As a result of our more rigorous data requirements, in fact only FOODLOG and CITYLIFE-MULTICALL provided sufficient rich data for the second research question. In both cases at least part of the work that was subject to spatial restructuring can be characterised as less knowledge-intensive. This means that the second stage analysis in particular provides material on practical knowledge in two semi-skilled but highly different types of work, respectively administrative work and telephone-based customer services. As these are both 'least-likely cases', we can state that they provide the added value we were aiming for in this second analysis as compared to the knowledge-intensive work covered in a broader range of studies.

3.4 Data analysis

3.4.1 Organisation of the data

The organisation case study reports from WORKS form the initial basis for the additional analysis of the case study data in the present study. The Belgian cases included in the analysis were carried out at our research institute and therefore we were involved in all steps of the case study research. For the cases carried out at other WORKS participant institutes we requested the interview transcripts in order to perform an original analysis of the raw data. The interview transcripts of ITHEALTH (the Norwegian case) and of EASTTOWN-GBA were not accessible in practice. In WORKS, each case study included 8-10 interviews which each lasted approximately 1.5 to 2 hours. Each interview transcript was approximately 20-25 pages long.

As a first step, the information from the interview transcripts was re-ordered and filtered according to our different core themes in order to write up a new case study report. This meant that the information from the interview transcripts that was of direct relevance - technical division of labour, knowledge utilisation, agency and strategies – was processed again in view of carrying out an original analysis of the data. This was particularly important in terms of identifying key quotations from the various respondents. At the same time, this phase permitted some data reduction in the sense that issues that were not at the centre of our analysis were mostly not addressed or were synthesised, omitting excessively specific or elaborate quotations. This was done, for instance, where detailed information was provided on social dialogue and representation issues and on working time and work/life balance policies. When the case study was not carried out at our institute, contacts were established with the research team to further clarify certain aspects in relation to quotations, etc. if needed. In summary, each rewritten case report was a descriptive write-up of the restructuring event with the aim of gaining an in-depth familiarity with the case as a whole and its internal logic and in view of carrying out an original data analysis. Before finalisation, the new case study reports were sent to the research team that carried out the case study to be checked in order to verify that all data were correctly interpreted and to obtain final approval to use the raw data.

3.4.2 Case study analysis: different steps

3.4.2.1 Within-case analysis

The data from the seven cases were first interpreted by means of a within-case analysis. The main objective of within-case analysis is to assess the consistency and internal validity of each case. This enables 'the unique patterns of each case to emerge before generalising patterns across cases' (Eisenhardt, 1989: 540). An expected key outcome of this phase is verification of the extent to which the expected relationships between our key concepts are valid for each individual case. In the methodological literature, this is denoted as a replication strategy (Eisenhardt, 1989: 542; Darke *et al.,* 1998: 284). For the first research question, these relationships concerned the relationship between the spatial restructuring and the technical division of labour and the possible impact of the latter on changes in disturbances, on how they were regulated, and on job quality. To the extent that the different individual cases exhibit consistent similarities, the internal validity of each case is enhanced and the power of the analytical concepts is confirmed. For the second research question, the research endeavour was different, involving a search for a deeper understanding of knowledge in the labour

process and of the agency of management and workers in relation to that knowledge in a restructuring context. This interpretative analysis takes greater account of unique contextual factors. Consequently, each case is more idiosyncratic and there is less opportunity for comparative analysis.

It was important to reconstruct the restructuring event carefully and identify the different determinants, factors and outcomes. In order to understand the restructuring process, how it was initiated and evolved during its implementation, we first looked in detail at information on the background of the company, the overall company policy concerning the organisation's activities, the background of the specific restructuring project, *i.e.* its main drivers and strategies and the management decisions involved in designing and implementing the restructuring process. Secondly, the specific format of possible related changes in the technical division of labour and the functional coordination of the labour process were analysed, notably the type and the level of change (changes at the level of the business function or its component (sub)tasks). Thirdly, the impact of these changes on disturbances and on the functional regulation of these was analysed. For the latter, we refer to the different management strategies applied both in anticipation of restructuring and during the process, as found in the literature, such as the use of ICT and the setting up of specific coordination functions or communication channels. Finally, changes in the job quality of the workers involved were examined.

For the second research question, we added knowledge to the analysis and this implied shifting the social reality of the restructuring case onto a different level. For the management, the focus was on strategies in relation to knowledge management and employment regulation measures that influenced the utilisation of knowledge (such as recruitment and training). Here too, we specifically identified management activities found in literature, more precisely knowledge codification efforts anticipating the restructuring event, diverse formal and informal training efforts and interventions to enable employee proximity such as staff mobility. In terms of the workers' responses, the aim was to find indications of uncodified knowledge and of contextualisation and improvisational work practices used in the activity being restructured. Indications of uncodified knowledge can be found in that this type of knowledge may be lost during the transfer, leading to problems in task execution at the destination, such as mistakes made by the employees at the destination. In addition, there is a range of possible employee reactions. The focus here was on contextualisation and improvisational work practices which shed light on how workers bring knowledge into work. Also, after the restructuring process it was relevant to investigate the extent to which workers attempted to develop improvisational work practices to achieve better contextualisation of the work, to serve their own needs better or to solve work-related problems. As indicated, we did not analyse collective or individual actions or reactions (whether informal or formal) concerning changes in employment conditions (such as changes in contracts, wages, working times, etc.), employment relations (representation and collective bargaining issues) or health and safety issues.

3.4.2.2 A comparative perspective

Since this is a multiple case design, the aim was to carry out a cross-case comparison involving a closer examination of the similarities and differences between the cases. In general, such a cross-case analysis is useful because it permits examination of similar phenomena in diverse settings, which enhances the explanatory power of the relationships under investigation (Darke *et al.,* 1998: 278).

George and Bennet list the conditions for this method of analysis (George & Bennet, 2004: 67ff). The authors state that cross-case comparison should be both structured and focused.

First, it is important to have a clearly defined universe with predefined classes and subclasses of events. In our study, this universe consists of spatial restructuring events in three different types of transformation processes. Second, the research objective should be clearly defined in order to guide the selection of the cases. We have previously explained the sampling procedure for the case studies in the WORKS project and the selection from this sample for this study according to defined criteria. Thirdly, the cases should provide data on variables which are interesting from a theoretical perspective and may offer explanations. In this study, this theoretical perspective has been set out at length in the previous chapters. Since the data were collected in the context of the WORKS project, a previous check has been carried out as to whether sufficient information was available.

A fourth requirement is that the cases should be well-structured so that comparability between the cases is possible thanks to the standardisation of respondent selection, interview questions and reporting that are applicable for each case. In WORKS, the empirical process was standardised in view of a cross-case, cross-sectoral and even international comparative perspective. Finally, comparison is only possible when it is focused, meaning that it only addresses certain aspects of the case study investigation. As this was also the case, the conditions for a cross-case comparison of the selected cases for this study were, generally speaking, met most effectively for the first research question.

In order to proceed with this cross-case comparison, in a first step we looked at the extent to which the specific formats of spatial restructuring were similar in the different contexts of the selected cases and if there was a relationship with changes in the technical division of labour. These contexts included in the first place organisational structures that implied tasks with different knowledge characteristics. Secondly we investigated the extent to which there were similarities in the effects of the changes on disturbances and their regulation and on the job quality. These comparative examinations permit feedback to the theoretical framework set out in Chapter 1. As we have already said, however, there is a trade-off in case study research between complexity and cross-case comparability. The fact that different restructuring events are complex and situated in a multitude of contexts inevitably places limits on the possibilities for carrying out a textbook cross-case comparison. The cases are thus relatively idiosyncratic. This is particularly true in the case of the second research question, where an in-depth within-case analysis is the major objective.

4 | Spatial restructuring and the technical division of labour

Introduction

The objective of this chapter is to empirically answer our first research question on the relationship between spatial restructuring and the technical division of labour. In accordance with our theoretical understanding of organisations and the labour process, our starting point is to look at decisions made by the management to change the spatial allocation of parts of the transformation process. Such changes will be considered if these are expected to support the appropriate and effective achievement of the organisation's goals. At the same time, these management decisions can be investigated from the perspective of the labour process in the sense that they will alter the conditions of the employment relationship and specifically the mixture of autonomy and control to which workers are subjected. In the course of building our theoretical model, and especially once we included an analytical scheme that makes it possible to observe organisational structures, this first research question was further refined. On the one hand, we ask whether spatial restructuring will be accompanied by changes in the level of functional concentration, differentiation and task specialisation and fragmentation, which are the three levels of grouping functions in a production structure. We left the specification open in terms of the direction and sequence of the relationship between the spatial and technical division of labour, in the sense that changes in the level of functional concentration, differentiation and task specialisation and fragmentation may either result from spatial restructuring or precede it and hence facilitate relocation. On the other hand, we expanded this question to consider the potential effects of such changes on the prevalence of disturbances in the transformation process and the regulation potential available to resolve these, and also on job quality.

Seven spatial restructuring events are analysed to find the answers. In a first step, the focus is on the precise way in which the business function is spatially restructured: we investigate which functions and tasks are relocated and compare the technical division of labour of this business function, its constituent tasks and their relationships before and after the relocation. Secondly, we analyse the disturbances that occur in the restructured production structure and the measures implemented to deal with them. More precisely there is an analysis of the problems that occur during and after the restructuring and the way in which these are managed. Thirdly, we examine the impact of spatial restructuring on job quality.

In order to carry out the cross-case comparative analysis, we searched for a classification criterion for the seven cases in the sample. Since organisational decisions formed our point of departure, the criterion for classification is the format of the spatial restructuring as it was intended, designed and initiated by the management. This makes it possible to assess whether possible simultaneous changes in the technical and spatial division of labour are conceived at the start or whether these are implemented during or after restructuring. A key issue in relation to the use of business functions as the unit of observation and analysis can also be addressed, namely the level at which the technical division of labour occurs. On this basis, three types of restructuring can be identified in the sample: (1) the intended full relocation of an entire business function, (2) the subdivision of a business function into distinctive parts with different spatial allocations and (3) the relocation of functions and tasks leading to geographically distributed work which remains highly interdependent and requires

iterative cycles in the work flow. Since this first empirical section introduces the various cases in the sample, a description is provided of each company under investigation.

4.1 Relocating business functions

In a number of the cases selected it appears that the objective of the spatial restructuring was to bring about a geographical shift of an entire business function to another company or subsidiary at a remote location. As explained in Chapter 1, offshoring and outsourcing are often defined as the relocation of an entire business function to other sites of the value chain in a so-called 'lift and shift' operation. Such restructuring events usually aim to bring about geographical centralisation of a similar business function from dispersed sites. Such a corporate strategy is often motivated by a desire to reduce labour costs, meet efficiency objectives and find economies of scale and is based on a traditional business process reengineering rationale. It is a model that underpins the establishment of so-called business shared services centres (BSSC), which has become a regular practice in many large and mostly multinational companies in business services sectors (Ramioul, Huws & Kirschenhofer, 2005). Three case studies fit into this category. The business functions are logistics, IT and production.

4.1.1 A typical business services case: the logistics Business Shared Services Centre of FOODLOG

The first case study concerns a small part of a comprehensive restructuring programme of a global company. The ultimate corporate goal is the creation of a single, integrated, cross-functional organisation focused on operations and with uniform procedures. The relocation of the logistics administration to a dedicated centralised Business Shared Services Centre (BSSC) is the focus of the case study (De Bruyn & Ramioul 2007b).

4.1.1.1 Presentation of the company and its strategies

The history of this Benelux beverage company, nicknamed FOODLOG, is characterised by a very fast evolution from a locally embedded and family-owned firm to a multinational company, built through a wave of worldwide acquisitions. Its governance structure evolved to become a global company quoted on the stock exchange. The firm sells a broad range of 200 beverage brands throughout the world. The company has subsidiaries around the globe and it employs almost 100,000 employees. Production, packaging, warehousing and distribution are all dispersed across a number of geographically distributed domestic and international plants. Logistics encompasses all activities needed to organise the flow of goods and information. The flow of goods is a chain from the transportation of raw materials and packaging to the transportation of finished products to wholesale and retail customers. The information flow includes planning, forecasting, scheduling and processing of both demand and supply. Due to the geographically dispersed nature of the various plants and activities and the global nature of the market, the production process is spatially distributed with several units that are dedicated to and specialised in a specific product or packaging. The result is a vast and complex network of flows of raw materials, packaging, a variety of end products and flows of returned empty packaging between the different domestic and international sites. The core objective of logistics is to optimise these flows. This optimisation is especially complicated because the local sites are heterogeneous due to their histories prior to their acquisition by FOODLOG.

The rapid growth of the firm and its evolution to become a global company is being accompanied by a huge number of subsequent, comprehensive reorganisation projects

intended to optimise the dispersed activities and the links between them and harmonise processes and operations. The continuous process of reorganisation encompasses several worldwide projects which have a deep impact on all sites and leave few workplaces unaffected. Generally speaking, this global strategy is based on a number of principles. Firstly, policy and strategic development issues are concentrated at a higher geographical level while the lower levels focus on implementation. Secondly, business functions are centralised geographically, unless local contexts render this difficult or impossible (for instance, payment of wages may be subject to local legal and collective bargaining regulations). Thirdly, offshoring and outsourcing are considered where possible. Since the product and the process are defined as not complex, costs become the decisive factor in location choices and this results in geographical relocation of production activities (transporting liquids is very expensive compared to their economic value). Local demand, market and consumer preferences also play a role. Non-core activities which involve high labour costs, such as IT maintenance, warehousing and transport are outsourced. A key strategy is to offshore and centralise operations into BSSCs, each of which serves one regional zone. This BSSC model is used in particular for selected so-called 'transactional' activities (repeated administrative tasks) within the export, finance and procurement functions. Outsourcing of these activities may be a next step. Put together, these reorganisations mean that a lot of activities are being shuffled and reshuffled in several phases with successive reorganisation projects.

This overall corporate strategy also affects logistics. The decision to reorganise the logistics operations according to the principles set out here was taken at the global and regional zone levels. The logistics department at the Benelux site was responsible for implementation. Originally, each region had a unit responsible for exports to the company's subsidiaries and a customer services unit responsible for exports to customers. The export units of the different regions were then transferred to a new Central European in-house BSSC. The offshoring of the export unit to the centralised BSSC, which affects a small team of seven employees, is the subject of this study. According to the supervisor of the BSSC, the chosen location, a Central European capital city, was based on labour cost, language skills and the central location. Six months after the first announcement of the offshoring of the export unit, the work was transferred to the new BSSC. It was generally expected that a further relocation and rationalisation of the logistics function would be facilitated by full implementation of an ERP system.

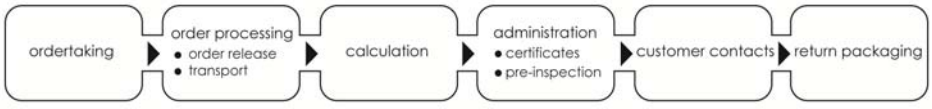
4.1.1.2 The work flow before restructuring

The logistics function consisted of four different departments: warehousing, transport, site scheduling (day-to-day planning) and asset management. The latter included management of resource flows comprising raw materials, packaging and products. This department was in turn divided into different units: inventory control, replenishment (management of the stock in relation to orders and links to production or other warehouses), packaging, customs and excise and the export unit. Most of the logistics departments were located on-site and close to production in order to facilitate interaction, especially in case of problems. The export unit reviewed was responsible for accepting and processing orders from subsidiaries outside the region. A total of seven people, including the head of unit, worked in the export unit. The logistics work flow is described in the box and depicted in the figure.

Box: the logistics work flow

1. Order acceptance (by e-mail, fax) and order entry into a computerised system.
2. Order processing:
   - order release: orders sent to the replenishment unit to plan packaging and production, taking into account the available stock. Order release is the key milestone in order processing: it has to combine information on inventory and production schedules for the product mix of the specific order and must organise transportation so that this mix can be collected and released for transport to the customer. Since different products are produced at different sites, packaged at other sites and/or stored at different warehouses, this is a complex puzzle. Some of the packaging and warehousing sites are outsourced. At the same time, the various inventory levels have to be recalculated constantly in order to fine-tune production planning, replenish and repackage, which in turn influences the release of subsequent orders;
   - once the order is released, transportation of containers by ship, plane or truck can be organised. Transport is outsourced, except in the case of trailers filled on site.
3. Calculations in relation to container loading with the different products of the order. To ensure cost-effectiveness, containers have to be fully loaded. Since the product mix is varied, these calculations may be complex.
4. Logistics administration:
   - producing the required certificates to transport the cargo abroad;
   - organising pre-inspections such as contacting government institutions that check the containers, especially in the case of remote destinations.
5. Contacting customers and keeping them updated about the progress of order processing (*i.e.* possible delays, product shortages; etc.).
6. Organising the return of reusable packaging such as empty bottles and crates.

Figure 4.1 The logistics work flow at FOODLOG



The Benelux site had the largest product and packaging variety in its geographical zone. One of the employees explained:[23]

> *'We have a disadvantage in comparison to other companies, because our products are very diverse. In other beverage companies you only have one product, so it's easy to load a container. But we have to make all kinds of calculations [to achieve optimal loading].'* (Export employee Benelux site)

Until early 2000, order processing was organised by operations. At that time tasks were integrated into parallel work flows and each employee was given responsibility for all activities in an entire geographical area (*e.g.* Africa, Asia, and Southern Europe). As a result, employees carried out all the operations for a single order. According to the head of the department, this switch to parallel order-based flows improved the efficiency of the department: on the one hand, employees got to know their geographical customer area very well (*i.e.* the trans-

23 All interview quotations in this chapter are own translations from the original interview languages (Dutch or German)

port companies, customers, legislation etc.) and on the other hand, customers had a single point of contact:

> *'Previously there were a lot of time loss and efficiency problems, because you constantly had to build bridges between people specialising in individual tasks. You constantly had to be informed of what the person next to you had done. Therefore, [at that time] we switched to integrated tasks.'* (Export operation manager Benelux site)

4.1.1.3 Geographical centralisation and functional concentration and differentiation

The restructuring process involved the geographical centralisation of the different export logistics units of EU subsidiaries into a new dedicated offshore BSSC. When the new unit was set up, it had to absorb the activities of the export units from three different countries. Initially, the original work flows of each unit were literally copied by installing separate tables alongside each other, duplicating the work organisation from the geographically dispersed units:

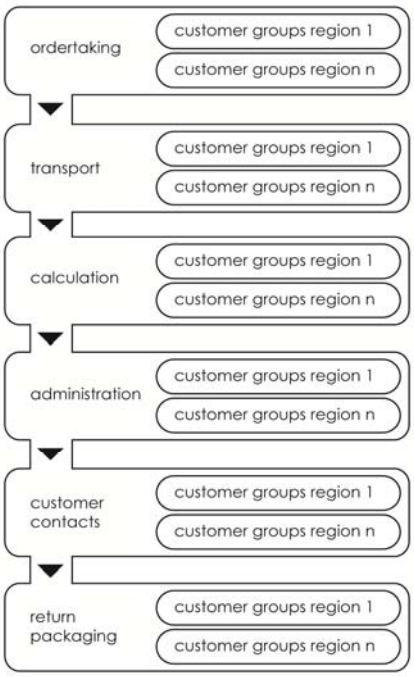
> *'So there was one table for the Benelux, one for the UK, one for Germany and, in a manner of speaking, each one did not know what the others were doing.'* (Logistics manager BSSC)

Shortly after the relocation of export logistics to the BSSC, however, the work organisation was fundamentally redesigned in three respects. First, the logistics operations of the different national subsidiaries were functionally concentrated into a single work flow for all subsidiaries in the regional zone. Second, as part of that process, operations were functionally differentiated: instead of grouping all order processing operations for all customers within a geographical export area, these were differentiated and grouped for serving different areas. As a result, order entry, transport planners, handling of certificates and customs and customer service contacts were each assigned to different groups of employees serving different geographical export areas. Third, in each of these groups employees were allocated to specific customers leading to further fragmentation of the work.

This option was apparently chosen on the advice of the external consultant who was hired to implement an ERP project and who also organised the relocation of the export units to the BSSC. According to the manager of export operations at the BSSC, the reasons for decoupling the different tasks of the logistics process were efficiency gains and the ability to switch employees between different customers if needed. He did, however, acknowledge:

> *'What you lose is customer focus and some process visibility because if order acceptance makes a mistake and it is not spotted, it has repercussions on the next steps.'* (Supervisor Benelux export operations BSSC)

Figure 4.2 Coupling similar logistics operations for groups of orders



Interestingly, the shift in the business function also resulted in a further change in the work organisation: contrary to the original idea of shifting the entire business function, not all activities on the Benelux site were offshored and the work flow was subdivided: the first step (order entry) and the last steps (transport, container calculation, logistics administration, customer contact and return packaging) were relocated to the new BSSC while the key middle task in order processing, order release (the link to replenishment and production planning) was decoupled from the transferred work flow and remained at the Benelux site.

In practice the restructured process looked like this: the BSSC entered the orders in the system, the Benelux site checked the availability of the different products at the different sites and released the order, which was then communicated to the BSSC which organised transportation to the customer, did calculations for the containers and processed the administrative formalities for the order. Order release was a milestone for controlling three key steps in the work flow: optimal loading of containers; transport planning including all the different order picking locations where the products were stored, and calculation and communication of lead times to customers. This was also the most difficult task in the work flow.

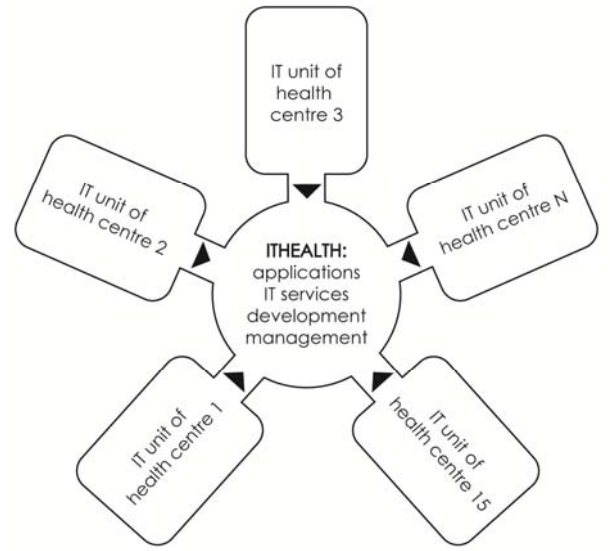
The main reason, according to the management, for this part of the process not being transferred is the fact that the order release was based on information (about inventories and production planning at different sites) that was not accessible to the BSSC at the time of spatial restructuring. The information systems for inventory, replenishment and repackaging were not integrated. Subdividing the work flow in this way meant that the BSSC remained highly dependent on the Benelux site for processing its orders. As for the Benelux site, the restructuring was seen as a detour (via the BSSC) inserted into export order processing which further complicated the whole process in comparison with the situation before, when the entire work flow for an order was integrated and assigned to one employee.

4.1.2 A similar case from the IT sector: ITHEALTH

A second case illustrates similar changes in the level of functional concentration accompanying a geographical centralisation, in this case concerning IT support activities. This case involves knowledge-intensive work rather than administrative work.

The case study concerns the outsourcing of IT services by a number of publicly-owned hospitals and health care service organisations situated in a region of Norway (Dahl-Jørgensen & Torvatn, 2007). Originally nine independent hospitals and six health centres had their own IT unit. The restructuring project included transferring the IT units of these fifteen health organisations to a new firm, ITHEALTH, which was still publicly owned but economically independent.

Figure 4.3 Geographical centralisation and concentration at ITHEALTH



Centralisation involved the functional concentration of the fifteen IT units into a single process. This geographical centralisation and functional concentration was expected to yield various improvements in costs and effectiveness, such as centralisation of purchases, coordinated use of resources and standardisation of work processes. The local health organisations transferred all their IT workers, equipment and contracts to ITHEALTH, which consequently owned, operated, maintained and developed all the IT-related infrastructure of the different health centres. In this new situation, the health centres negotiated specific contracts with ITHEALTH in order to receive the required IT services. After a while, each of the fifteen health centres installed a specific IT procurement officer as their link to ITHEALTH to coordinate development and maintenance at their location. Later, some centres further divided the tasks of this liaison function between a legal-contractual and a technical profile.

The functionally concentrated ITHEALTH was further differentiated into four operational groups, each of which was responsible for a specific part of IT services: Management, Development, IT service and Application. We are interested in the latter two. The 'Application' team was responsible for all software development tasks that were previously developed as specific local systems at the individual health centres. This team tailored the software databases to meet the specific requirements of the different health centres and maintained these over their life-cycles (*e.g.* Electronic Patient Journal, patient administration, laboratory computer systems, etc.). The 'IT services' unit included a centralised and concentrated cus-

tomer service centre supporting all the health centres. It resolved first-line problems and forwarded more complex ones to a central technical support group. Before the restructuring process, contacts between the helpdesk and the staff at the health organisations were direct, while after the restructuring every query had to go through this central helpdesk.

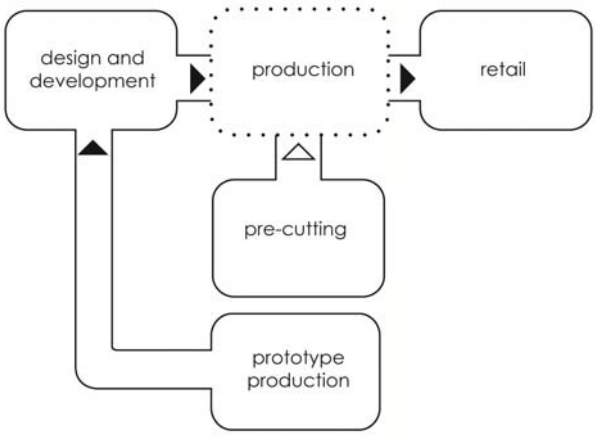
As in the previous case, however, the objective of full centralisation and concentration of all IT activities was not achieved. Here, the main reason why not all tasks were eventually concentrated and centralised was the existing IT-infrastructures and related expertise required to maintain these, and the fact that some local health organisations still continued to develop their own IT applications. Also the helpdesk could not be fully concentrated and each location maintained its own helpdesk because there were still locally developed IT systems which required the specific skills of the former IT employees. The objective of standardised systems and a fully centralised helpdesk was therefore not realised (at the time of the investigation). In addition, the work organisation of the helpdesk was changed. Previously there was a job rotation arrangement between first-line and second-line helpdesks, resulting in all staff having more versatile competences. After the restructuring process, IT consultants were assigned either to the front-line or to the second-line helpdesk with no possibility of switching. Finally, as has been mentioned, the different health centres also decided to divide the newly installed liaison function into a legal-contractual and a technical profile.

4.1.3 The effects of a change in the company's core business: WONDERWEAR

A third case concerned a multinational clothing company that produced luxury garments, nicknamed WONDERWEAR (De Bruyn & Ramioul, 2007a). This case study investigated the relocation of the remaining mass production activities of the parent company to existing production subsidiaries and subcontractors in North Africa and Central Europe. By selecting this case, a traditional process of relocating manufacturing to low wage countries was included in the sample. The case study zoomed in on the effects at the source company of the geographical relocation of mass production activities. One reason for this choice is that companies in remote destinations were not accessible for research. In addition, the developments at the source company were also interesting in that, as a result of the offshoring, part of the production function was shifted to the design and development business function, which was also considerably enlarged. This was part of the company's strategy of making design and marketing its core business rather than production. This was required because of the shortening of innovation cycles, increasing product complexity and the broader product range.

Once again, however, mass production activities were not entirely offshored: fabric cutting and prototype production were considered too delicate and complex and therefore remained at the source company. As has been said, prototype production, which was previously part of production, functionally shifted to the design and development unit. This integration process was carried out to reinforce that business function. As a result, the prototype unit was fully integrated via a feedback loop in the design cycle for new products. The prototype production workers were systematically involved in the various stages of designing the new collections. They provided feedback on the technical requirements and the 'produceability' of a new model (*e.g.* the number, complexity and variety of stitches) at several stages in the development process up to the final design. The prototype production workers also interacted closely with the production preparation department, which was responsible for writing the instruction booklets that accompany the pre-cut fabrics to the offshore mass production sites for assembly. As a result, the level of differentiation in the operational structure was reduced.

Figure 4.4 Decoupling part of production and integrating it into design at WONDERWEAR



Also at WONDERWEAR, some fundamental changes accompanied the shift of prototype production to another business function, but these point in a different direction as compared to the previous cases. In parallel with the relocation of mass production activities and as prototype production was transferred to design, the prototype workers' jobs were redesigned from highly fragmented into broader tasks. When mass production was still taking place at this site, production workers carried out one or two operations out of the 45 to 50 necessary to produce a final garment. The prototype production workers in the development department, by contrast, had to be able to carry out all the operations required to assemble an end product and to operate all the machines. In addition, they were in close interaction with the developers and production preparation staff. This resulted in tasks with a lower level of fragmentation and specialisation and they became more complex. The main management motive behind this intervention was to fully exploit the technical competences and experience of these production workers. The company was operating in a very tight regional labour market where former vocational training infrastructures for clothing workers had been eroded in response to continued relocation of mass production activities. This regional shortage of qualified production workers had eventually become the main driver for the continued relocation of mass production.

4.1.4 Summary: intended and unintended changes in the technical division of labour

A first observation is that in the three cases the relocation of the business function was intentionally accompanied by changes in the technical division of labour: in the first two cases the geographical centralisation of the business function included functional concentration in order to serve all the source companies. In the third case, the relocation of mass production led to the broadening of the upstream business function to include additional tasks originally belonging to production.

A second salient observation is that in these three cases spatial restructuring of the business function led to changes in the work organisation at lower levels. These were changes in levels of differentiation, task specialisation and fragmentation. In theory, the relocation of business functions does not necessarily have to result in changes in the technical division of labour at lower levels: a coherent set of operations that forms the business function may, in principle, be moved unchanged. There are two reasons to account for this different outcome. A first cause is that these additional changes were planned intentionally and were introduced

simultaneous with the geographical relocation of the business function. In the first case, FOODLOG, a shift to an operation-based work flow and more task specialisation and fragmentation was implemented to achieve additional rationalisation and productivity gains. Similar objectives were at the origin of the ITHEALTH format, which is in line with the particular outsourcing and business process re-engineering logic of both organisations. In WONDERWEAR, the reasons were different and related to specific strategic considerations. A shift in the company's core business and the increased speed of innovation required prototype production to be decoupled from the mass production function and integrated into design. This meant a different design for the remaining production tasks.

A second cause of changes at a lower level is that ultimately not all operations of the business function could be transferred in the restructuring process, thus giving rise to changes in the work flow at both source and destination. The reasons for the incomplete transfers were diverse: remaining technical infrastructures, insufficiently integrated or automated information flows, the (related) limited access to necessary information for employees at the destination and, in the third case, the complexity of some specific operations. In all, it appears that at some stage in the restructuring process the transfer of certain operations was assessed as technically non-feasible. These were decoupled from the relocated transformation process leading to a subdivision of the work flow. In the first two cases, a complete transfer would occur in time according to the management, since it depended on the implementation of more integrated technical systems. Expectations were optimistic and problems were assessed as transitory. In WONDERWEAR, while this was considered by the management, it was unclear and had not been decided whether and when cutting of the delicate and expensive fabrics would ever be transferred to other manufacturers. This was made dependent on the quality of potential subcontractors. At the time of the investigation, the management's assessment was that sufficient quality levels in cutting and in prototype production to meet the requirements of the high niche products were not being reached by the current subcontractors. These subcontractors were situated in the Far East and North Africa where, according to the management of WONDERWEAR, there was a different cultural understanding about the quality of the finishing of luxury underwear.

4.2 Functional differentiation as an intentional design parameter in spatial restructuring

Not all types of spatial restructuring are based on a strategy to fully relocate an entire business function. Restructuring can be designed from the outset to spatially relocate only part of the tasks or functions of one business function. When such an intentionally partial move involves a change in the functional composition of the business function, for instance by separating preparatory or supporting operations from 'making', the level of differentiation increases. In the following cases, which are both situated in customer services, increased levels of differentiation are intentionally conceived and implemented. Increased functional differentiation does not, however, necessarily have to result in changes in the level of specialisation and fragmentation of the different tasks in the restructured operations. We will also analyse the impact of these restructuring processes at these lower levels.

4.2.1 Separating question and answer: CITYLIFE

This restructuring case considers the outsourcing of inbound telephone customer services of the public housing administration of a large European city (Schönauer, 2007). It also illus-

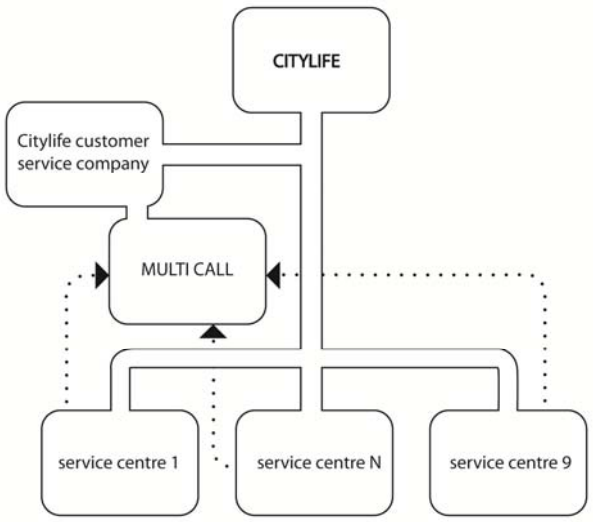
trates fundamental changes in the technical division of labour at each end of the restructured production structure which deserve to be analysed at a detailed level.

4.2.1.1 Presentation of the company and its strategies

At the time of the investigation, the city owned 220,000 flats which were rented to approximately 500,000 tenants. Administration of these city flats required a huge administrative department, nicknamed CITYLIFE. Tenancy administration includes the assignment of flats to citizens, all administration for the renting process, the renovation and maintenance of new and old flats, buildings and estates, technical interventions in case of problems (with electricity, gas, heating, glazing, water, elevators, vermin, etc.) and other interventions related to the housing communities (conflict mediation between neighbours, etc.). All these tasks require a well-established customer service which provides a link between the citizen-tenant and the city council administration. Until 1991 this administration was organised from the central city council department. Several restructuring processes were then initiated, gradually leading to an identifiable customer service business function.

Customer services were restructured in two fundamental ways: first, a functional deconcentration and geographical decentralisation of customer services and, second, the decoupling, concentration and outsourcing of the inbound telephone service. Firstly, nine decentralised walk-in customer service centres throughout the city were set up a few years ago. Each of these is made responsible for all tasks relating to renting flats in at least two city districts. This included relocating several activities, for instance in relation to housing governance: the janitors' offices in the buildings were closed and the janitors were transferred to the walk-in service centre in the respective district where they became 'housing advisors'. Telephone customer services were also moved from the central city department to the decentralised walk-in service centres. We analyse the second restructuring process: the inbound telephone service was decoupled from the decentralised customer services in the nine walk-in centres and was again concentrated, centralised and outsourced to a newly founded company, the CITYLIFE Customer Services Company, which was also responsible for marketing, IT and some other functions. As soon as it was incorporated, this company further outsourced telephone services to a centralised call centre consortium called MULTICALL. The figure below represents the company structure after both restructuring processes.

Figure 4.5 The restructuring processes at CITYLIFE customer services



CITYLIFE had 630 employees and there were 160 agents at MULTICALL. A final set of changes, initiated but not completed at the time of the investigation, involves the implementation of an ERP system which aims to integrate data management throughout the work flow.

4.2.1.2 Organisation and restructuring of work flow

People seeking to rent a flat are given an application form and placed on a waiting list. Applicants are allocated a flat according to several criteria relating to citizenship, income level and actual housing needs. All administrative aspects of the tenancy were managed at the walk-in service centre. The work flow involved the administrative and legal procedures related to the tenancy (contracts, payments, deposits, handing over the flat, flat visits). It also included lawsuits in case of conflicts with tenants, for example in relation to rent arrears. Next, there was the whole area of acquisition of flats, housing improvement and maintenance. This technical part included activities ranging from comprehensive renovations (installing bathrooms, painting) to interventions in the case of small technical problems and defects (broken light in the stairway,) and emergency interventions (gas leaks, broken glass, etc.). Basically, there were three types of employees responsible for these areas: commercial assistants (legal and administrative aspects), technical teams (engineers and technicians), and former janitors - housing advisors (day-to-day management of the flats on site).

When the service centres were set up, their work was structured into three main activities: walk-in face-to-face customer services, inbound telephone calls and work in the field. Before the outsourcing of the inbound telephone service, customers either dropped in at the service centre or called the service centre employees directly. It was thus essentially the customer who directed the work of the service centre employees. At that time, the administrative work in the service centres was organised by operations: a tenancy file was processed by different people with identical job descriptions. Since the work flow on the file was too fragmented, customers sometimes had to come back, for instance because the employee responsible for the next step in the tenancy process noticed that documents were missing. The information given to customers also often differed between employees, leading to complaints from customers and double work for the employees. As for the technical interventions, before the first restructuring process many small problems were solved by the janitors working at the estates or by technicians who stopped by and asked if anything urgent had come up. When the janitor/housing advisors were centralised, weekly team meetings were organised to schedule the required technical interventions.

The aim of improving customer services was a matter of general concern at city council level and led to a comprehensive study on how to reorganise the service provided to citizens. The analysis showed that poor quality of service at the service centres was the biggest complaint. Long waiting queues on the telephone and employees that were almost impossible to contact led to feelings of frustration. This was caused by the fact that both inbound telephone and face-to-face customer service were dealt with simultaneously by the service centre employees. The integration of all customer services activities meant that employees had to answer incoming calls while they had customers in their office or were doing back-office desk work. The employee usually did not have time to prepare a satisfactory answer to the customer's request. What is more, often these were only very basic requests such as the address or opening hours of the office. During service centre opening hours, the conversation with the customer who was sitting in front of the employee was constantly interrupted. This was especially problematic when this meeting was addressing a difficult problem, for instance a tenant who could no longer pay the rent and had to move out. Employees were concerned that anonymity and privacy were not guaranteed. In general, they had the feeling

that neither of the two customer services, telephone or face-to-face, was being provided appropriately. A service centre employee explained:

> *'As soon as you pick up the phone you hear: "Jesus for God's sake, where is my money!", "What about my contract!" At the same moment I have someone sitting in front of me and this really makes me sweat (...). You have customers in front of you and the phone rings all the time. I have to pick it up immediately; I can no longer let it ring because it this gives a very bad impression when you do not pick up the phone. And then I have conversations which actually require a degree of privacy.'* (Service centre employee)

During back-office work, when rather complex administrative activities have to be carried out (finalisation of a contract, preparation for court, raising invoices, etc.), these telephone interruptions were again stressful and affected efficiency.

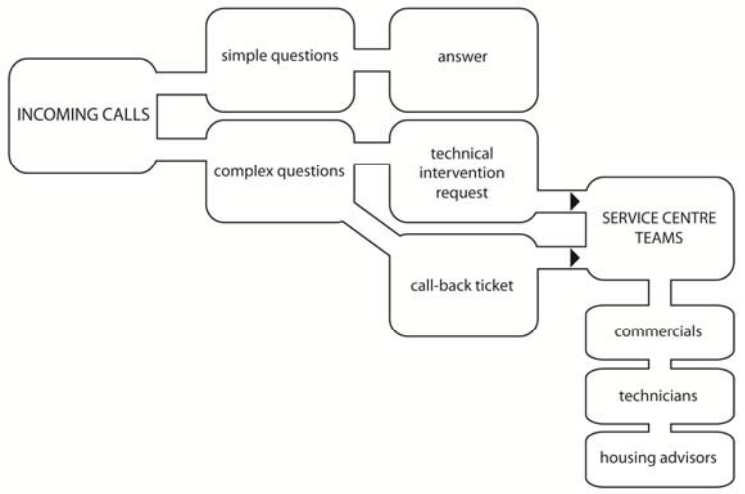
The management concluded that the best idea for the reorganisation of customer services was to subdivide them by decoupling what they called 'obvious tasks'. As a result, the customer services business function was subdivided into two parts: on the one hand a concentrated, centralised inbound telephone service and on the other hand the decentralised service centres still offering a mix of face-to-face customer contacts, outbound telephone contacts and service provision in the field. After the second restructuring process, all incoming telephones from customers were received and handled at the call centre. This acted as a filter and the call centre agents only redirected questions to the service centre which they could not solve. Tenants or prospective tenants contacted the call centre broadly in relation to three main issues: basic requests for information which make up about 40% of calls (opening hours, location of the service centre, where to find forms on the website, etc.), questions about tenancies, moving in and moving out (forms, criteria, etc.) and reporting of all kinds of defects. The easy questions were processed in a highly standardised way with guidance from a computerised system and each lasted a maximum of 3.5 minutes. If the customer query concerned an issue that required intervention by the service centre team, the call centre agent basically did nothing but record the customer question and forward it to the employee who could then provide the answer when he or she saw fit. This was done by preparing an electronic 'callback ticket'. This included the contact details of the customer as well as a basic description of the problem or the question. In case of defects, the defect was inserted in the computer in a similar way to a tenant notification, which was then processed to create an order for the repair company. In case of emergencies (broken glass, fire, gas, etc.) that can occur at night or at the weekend, the agent could take the direct steps as needed to solve the problem (the call centre is open 24 hours a day). Later on, the walk-in service centre took over to bring about a more long-term repair. It was important that the information on the ticket was correct, complete and precise, because it had to enable the service centre employee to deal with the customer's request.

At the service centre, the employee turned on the computer and saw the list of callbacks he or she had to make. Based on the information on the ticket, the employee prepared for telephone call by reviewing the administrative file or checking with colleagues what the problem might be about. The employees made the calls at their own pace, in the order they chose and taking into account the other customers with whom they had appointments. They were, however, bound to a 24 hour deadline in which to call the customer back, which was the service level communicated to customers. The ticket followed the case from start to finish. All employees involved – both in the call centre and in the service centres – could add their comments. At the time of the study, about 3,500 calls per day were coming into the call centre, of which about 1,500 could be handled by the call centre agents. In about 1,000 cases

agents produced a callback ticket for the service centres and about 1,000 calls led to repair reports that were forwarded to the service centre but did not require follow-up.

In short, outsourcing inbound telephone customer services involved three major interventions in the technical division of the work flow.

Figure 4.6 The changes of the customer services work flow at CITYLIFE-MULTICALL



First, inbound telephone services were decoupled from the other operations of the various service centres and concentrated and centralised in another organisation which led to increased differentiation. Second, customer requests were sorted according to the nature of the question, separating complex from simple problems. Third, in the case of complex customer problems the question and answer were divided up according to where, when and by whom these were to be processed. In structural terms, the latter intervention entailed increasing task specialisation between preparation, initial recording of the problem by the call centre agent and processing the question into a ticket which is necessary to come up with the answer, and providing or 'making' the answer. The preparation process was also further divided between production of the ticket and detailed preparation by the service centre employee at the decentralised service centre. Due to these far-reaching changes and the stark contrast between the two-parts in the customer services work flow design, which was originally integrated, we have analysed the organisational structures at CITYLIFE and MULTICALL in more detail.

4.2.1.3 Teamwork at CITYLIFE and standardised call centre work at MULTICALL

CITYLIFE brought about a major change through the functional deconcentration and decentralisation of the customer services that was implemented in the first restructuring process. With the outsourcing of inbound telephone calls, however, this work organisation was further optimised. These two interventions fundamentally altered the jobs of the civil servants. First, decoupling the inbound telephone calls meant that employees could focus on the more complex aspects of the tenancy (flat visits, contract finalisation, etc.) and fully concentrate on either speaking to customers or processing their administrative files. Although their work still covered all the technical, administrative, legal and practical aspects of renting flats, they were freed of direct incoming calls. The elimination of constant and unpredictable disturbances considerably enhanced their autonomy. Since they received information on the

customer's question in advance from the call centre, the employees called back when it suited them and they were able to prepare for the phone call, which rendered the service more effective.

Second, a new team structure was introduced at the time of the outsourcing process, based on a grouping of all functions for a range of customers. Instead of the previous operation-based work flow of the tenancy files, the service centres were now organised in teams that jointly managed all tasks for a number of flats, although with some internal division of labour based on specific types of expertise. The three types of employees with different tasks and educational backgrounds were brought together in a team: technicians were responsible for renovations and maintenance, commercial assistants were responsible for contractual and administrative aspects and there was one housing advisor and one secretary. The geographical area for which the team was responsible was reduced to half the size in comparison with the previous work organisation, so that a team covered approx. 5,000 to 6,000 flats, but the tasks were enlarged.

The management's idea behind the team concept was that all employees should have insight into all parts of the work flow. Each file was therefore given to one commercial assistant but could be handed over to other colleagues of the team when necessary, notably to the technicians or housing advisors. The transition to teams was also linked to the upgrading (in terms of formal qualifications) of the housing advisors in particular. One team leader was responsible for two teams. The main tasks of the team leaders included conflict mediation, for instance in relation to work schedules, and monitoring of individual and team performance. In the new work organisation, the working week at the service centre was divided into fixed time slots: time on-call at the walk-in customer area, appointments with customers, office work to process the callback tickets and to handle the requested interventions that were entered on the computer by the call centre agents, going to court for hearings relating to disputes with tenants, visiting flats with customers (commercial assistants) or appointments with contracting firms in the field (technicians).

The work organisation at the MULTICALL call centre was obviously completely different. Here, employees were organised in groups of ten agents, but these groups were only meant to create some proximity between a number of agents and had no impact on the work organisation. Work was individual, highly standardised and short-cycled. The work of the call centre agents was guided by a knowledge database and detailed scripts. The knowledge base was conceived to precisely simulate a telephone conversation. It guided the agent through an algorithm of questions in order to refine the customer request. For example, a customer called to report that water was leaking. Once the service domain was selected as plumbing, the agent started clicking on a subsequent set of choices based on the customer's replies until all information was clustered on the ticket to enable the service centre employee to take effective action: exact address, flat, name, telephone number, etc. The database was structured in a flexible way allowing different entries according to the information first provided by the caller (building, name of the tenant, type of question, etc.). Initially the knowledge base was rather basic, but gradually it was supplemented and it eventually became very detailed and comprehensive. It included all types of information required to speed up service provision, for instance on brands and types of washing machines, elevators, etc. The database was continuously updated. Work at the call centre was further fragmented into first-level agents who dealt with direct customer contacts and a small group of second-level agents. The latter had an additional supervisory function. They checked tickets, overlooked process conformity and had a higher degree of authorisation within the database. They mostly worked in the evenings, at night or at weekends, when there was more time to carry

out the additional checks on the tickets before releasing them. In these cases they could also handle the emergencies.

The call centre had developed detailed service level standards. The most important of these were that 80% of calls had to be picked up within 20 seconds and the average processing time for each call, including follow-up (finalisation of the ticket or tenant notification) should not exceed 3.5 minutes. Additional information was recorded on the system and processed to generate performance metrics, such as the duration of a case until completion. All agents were systematically monitored and received feedback on how they spoke, on the mistakes they made, the duration of their calls, etc. Over the years the responsibilities of the call centre had gradually increased as the knowledge base became more elaborate and more customer requests were managed directly at the call centre.

According to the call centre manager, the customer services were working very well:

> *'The advantage is that the service does not depend on the agent or his or her knowledge. When the address and the service domain are inserted, the electronic ticket is automatically sent to the competent walk-in employee. (...) The agent can therefore fully concentrate on the actual conversation with the customer. (...) A consistent quality can only be reached if the service provided does not depend on who answers the call and if the scope for (mis)interpretation is reduced to a minimum.' The manager concluded: 'We simply locked the call centre agent into a knowledge space'* (MULTICALL manager).

4.2.2 Dividing front-office and back-office: CREDITCARD[24]

Another case study demonstrates a similar way of subdividing a customer services work flow. This case concerns the relocation of front-office activities responsible for first-level debt collection to an offshore call centre while the administrative file and second-level debt collection tasks remained at the original site. The company in question handled credit card operations in the Benelux. The group management of a US financial services company gave its European management the objective of consolidating as many of the company's activities as possible at favourable locations in Europe. After the centralisation and concentration at an offshore destination of telephone customer services from two countries, the company attempted to achieve further efficiency by partly relocating a call centre with 150 employees from the Benelux site. The Benelux site consisted of two operational units: Customer Services and Credit & Collections. The Customer Services staff were doing typical, highly computerised call centre work. The Credit & Collections unit, which is of interest here, was taking care of overdue accounts and debt collection and consisted of a front-end and a back-office. The front-end had to contact defaulters and urge them to pay. This work consisted of a majority of outbound calls and was largely computerised, in contrast to the back-office. When the payment deadline expired, the cardholder became an official debtor and the back-officers had to call on lawyers, bailiffs, debt-collection agencies, etc. to try to recover the company's money.

Through the restructuring process, the front-end and back-office of Credit & Collections have been decoupled and the former has been relocated overseas. With the integration of the front-end activities into the existing call centre, the work flow shifted from an order-based to an operation-based work flow. Originally, the employees took care of a wide range of operations for a small number of clients. The work organisation in the relocated unit, in contrast, meant that employees only handled outbound calls but did so for a wider range of clients. As a result, the activities at the destination became more standardised. The work organisation in

24 This case study was carried out as part of the EMERGENCE project and was previously published in (Dejonckheere, Ramioul & Van Hootegem, 2003; Ramioul, 2004)

the back-office was unchanged. The offshore call centre was heavily supported by a whole range of ICT applications such as advanced call centre technologies. These ICT applications generated surveillance possibilities at both sites. The most important form of IT support consisted of an internal information system in which the entire customer database was stored and maintained. The database could, in principle, be accessed directly from both source and destination.

4.2.3 Summary: contrasting work organisation designs between source and destination

The first striking observation is that the restructuring of these customer services occurred along a dividing line intended to clearly separate the service according to its specific characteristics and requirements (as described in Chapter 2): the simpler, short, repetitive services with low, one-off interactions and codifiable responses were decoupled from the more complex and iterative service work. In the two cases these differences between activities belonging to a single business function formed the basis and the explicit motive for this specific restructuring format.

Secondly, subdividing the customer services business function and relocating the decoupled part coincided with a range of other changes in the technical division of labour. In MULTICALL, an increased fragmentation of work was implemented, while in CREDITCARD the relocation gave rise to a shift towards an operation-based work flow. Thirdly, the work organisations at both ends of the separated work flows were redesigned in fundamentally different ways. While in the relocated parts the level of technical division of labour increased, the opposite model of integration was applied to those parts of the work flow that remained at the source, which was particularly obvious at CITYLIFE. Also in WONDERWEAR, which was discussed in the first section, this tendency was observed for the prototype production tasks, which were reshaped in a different way from the traditional Tayloristic model applied to mass production, which was hived off to production capacities abroad. In the case of CREDITCARD, we unfortunately lacked sufficiently detailed information on the organisation of the work flow at the back-office, but based on the complexity of this part of the work flow (second stage debt collection) and given the fact that an order-based model applied to the whole debt collection work flow before the restructuring, we can assume that this back-office remained organised in an order-based way after the restructuring.

4.3 Mutual interdependencies in IT

From the selected cases, a third format of spatial restructuring came to the fore in the two remaining IT cases. In the first of these, spatial restructuring involved the redistribution of software programming work between two sites. In the second case it concerned the outsourcing of data management while data input (and the data) remained at the source. In both cases, and especially in the last one, this created a situation of intensive remote collaboration. This third category comes close to the second category in that the spatial restructuring is again not designed at the level of the entire business function and implies a decoupling of part of the work flow at a lower level. The difference between this and the second category of restructuring cases, however, is the iterative process of moving work back and forth between the two sites, which was required due to the high and persistent dependency of the work. In the previous category of customer services, decoupling involved splitting up a more linear work flow (Customer Services and Debt Collection) and had clearer task demarcations.

Work in the IT industry is generally more difficult to fit into the description of a linear, sequential chain, since the production and maintenance of IT systems may include several iterative steps and feedback loops (Vandenbussche, Devos & Valenduc, 2007: 35). This is especially the case if the transfer concerns a wide range of technical services which are part of the core IT system of the organisation and involve a limited number of IT providers on the basis of long-term contracts (Valenduc, 2007; Vandenbussche, Devos & Valenduc, 2007: 36). In both of these cases the management also took account of the specific expertise requirements for parts of the work flow.

4.3.1 Remote programming in the IT sector: MESSENGER-DIGIT

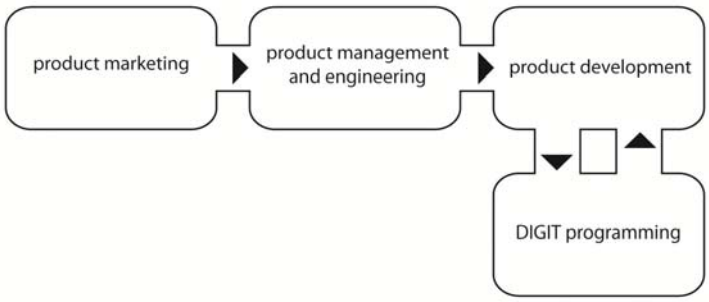
This case study focuses on the relocation of part of the programming and testing of software development (Flecker & Schönauer, 2007). It concerned the relocation of a number of programming tasks to a specialised supplier while the source company retained control of the design and management of its IT systems. The destination served as a remote operational unit under the authority of the source. In this case, the work organisation at both sites is again quite contrasting. We will therefore examine the technical division of labour at both ends in greater detail.

4.3.1.1 Presentation of the company and its strategies

MESSENGER was a Western European technology provider for hardware and software, which was taken over in 2004 by a large US company called COMMUN. MESSENGER had approximately 220 employees and was working mainly for large international customers from the financial sector around the globe. At the time of the study, the number of clients was estimated at 4,000. Earlier, COMMUN also disposed of a small development unit in a Central European country, nicknamed DIGIT. DIGIT used to be a data entry company working for a Southern European client. The US Company provided the technology to the data entry company and, over time, became the full owner. The data entry company also had a small development unit in charge of adapting the data entry software to make it more efficient. The data entry activities were not successful and the US company decided to sell off this business and only to keep the development department of DIGIT. The original idea was that the DIGIT developers could be brought in for some relocated development work from the USA. In order to do this, additional programmers were recruited. This process of relocating work to DIGIT, however, apparently did not work out very well. Consequently, the capacities of DIGIT were not really used by the US Company. When MESSENGER was taken over by COMMUN and was located relatively nearby, the US headquarters asked the local development manager of MESSENGER to see 'whether they could do something' with the DIGIT development unit.

As a result, MESSENGER began to use the developers at DIGIT for small programming and testing tasks for their own projects. Initially, MESSENGER did not have to include these activities in its budgets, so it had access to cheap extra capacity, but after a whilethe activities had to be accounted for. Gradually, the collaboration between MESSENGER and DIGIT became more systematic. The capacity of DIGIT was assessed as a useful additional resource and was not considered to be a possible competitor in the broader group of development units of COMMUN. On the contrary, the take-over by COMMUN led to increased levels of work at MESSENGER because of new products that were assigned to it. In the end, DIGIT was formally included in MESSENGER's development department, rather than directly within COMMUN.

Figure 4.7 Relocating software development at MESSENGER-DIGIT



MESSENGER had three operational business functions: Product Marketing, Product Management and Engineering, and Product Development. Product Development was organised globally and the heads of all development subsidiaries (six in total, including DIGIT) reported directly to the COMMUN head of Product Development. Since all sites had their specific products and customers, there was no real competition but also only rare collaboration between the different sites, except between DIGIT and MESSENGER. Still, projects were assigned to the different development sites based on the available know-how and capacity, but 'lobbying' apparently also played a role in decision-making. For its specific product niche, MESSENGER had customers around the globe. These were served by a global network of sales and support subsidiaries which acted as single contact points with the customer. MESSENGER's development activities were less involved with developing large projects directly for third customers but did involve both revisions of existing products and contributions to the internal development of new products. This meant that the development team itself had few direct contacts with external customers, apart from additional second-level or third-level support.

4.3.1.2 Work organisation at the Development Unit of MESSENGER and relocation to DIGIT

As has been said, the development process for a new product or application, from the definition of needs by the customer until the application or product comes into operation, was functionally concentrated in three units: Product Marketing, Product Management and Engineering, and Product Development. Although most of the products developed at MESSENGER were standardised, regular updates had to be implemented and new functionalities had to be added. The Product Management and Engineering department defined the functions that needed to be developed through close contact with Product Marketing or with the customer. These specifications were then passed on to Product Development. Orders related to new specifications that had to be added or errors in existing products that had to be fixed. For the development of new products there was also functional differentiation between Product Marketing, Product Management and Engineering and Product Development. Ideas were developed at Product Management on what a new product or application needed to look like and what functionalities it needed to have. This 'wish list' was handed over to Product Development which was then responsible for programming and testing the new application. Product Development additionally provided second-level support for the global network of local sales and support teams that worked directly with the customer. If the second-level support could not solve the problem either, the development department of MESSENGER was brought in as on-site third-level support.

Software development is typically organised in projects, as was also the case here. The Product Development unit consisted of 45 developers. For each new development project a

team was put together, headed by a project leader. In the development department of MESSENGER there were four such teams which were basically organised in a matrix structure. Functional roles included programming, writing up technical documentation (user and installation manuals) and testing. Programme development required and resulted in a 'deep knowledge' of a product, which was necessary to make changes in the source code when adding functionalities in response to new customer requirements or when updating the product. Testing, on the other hand, relied on a broader overview of how all the pieces fit together in the final product, how they interact with each other and the requirements to make the whole programme function. Technical documentation writing was a crucial interface to end-users, although these were also mostly technicians or administrators of IT systems. These documentation tasks were therefore basically also technical. Within the teams, the developers cooperated closely during the projects. During the lifetime of a project, flexible allocation of developers usually did not take place between projects (Flecker & Schönauer, 2007: 10). After the project was finished, the team was dissolved and a new team was composed for a new project, leading to varying team compositions.

Developers usually combined work on a new product with revisions of existing products. There was still, however, a degree of specialisation and acquaintance with some of the firm's products. This was important for the revision of products which might have a long history and were not always well documented. Since most of the developers were specialised in a number of products or domains, this created opportunities to provide back-up (for instance to cover holidays or assist customers on site). In general, the aim was to achieve an optimal match between product expertise and the type of projects. Tasks were assigned to project managers in a more flexible way and they could be appointed to lead several projects simultaneously. Their tasks were quite different: this was above all a coordination function, including coordination of the work which was transferred to DIGIT. This included making a clear project plan, assigning tasks, monitoring work progress, communicating with customers, drawing up and monitoring budgets, etc. The project leaders had a degree of autonomy to prioritise orders when organising the work. The project leader was in close contact with the local team leader at DIGIT in order to hand over the work.

The operation to shift part of the development work to DIGIT can be described in terms of fragmentation because the spatial restructuring process involved changes within the programming function. The programming tasks that were hived off to DIGIT were the most standardised work: coding, fixing errors, writing documentation and repetitive testing. When the project leader at MESSENGER had a clear project plan, he decided what work could be done at DIGIT and provided the specifications for that work, including detailed estimates of the time needed. This was communicated to the team leader at DIGIT who in turn distributed the work between the developers of the team assigned to it at DIGIT. The team at DIGIT was not specifically monitored by the project manager at MESSENGER, although there was, of course, detailed checking of the output before it was accepted. When the work was done at DIGIT, it was delivered to the project leader at MESSENGER who checked whether the output worked well and fitted correctly into the software programme as a whole. He then gave feedback to the DIGIT team leader on possible corrections to be made or on acceptance of the job. Conference calls at management level were organised on a weekly basis to discuss the fine-tuning of planning and the results of the work. Furthermore, when things were not clear, developers at both ends communicated to clarify the precise requirements, mostly on a daily basis.

One illustration of the collaboration between the two units is provided in the form of a project to introduce an automatic testing procedure. Testing involved implementing newly developed applications or features into the programmes and simulating (typically on a

sampling basis) whether everything would function in a real life context. At MESSENGER, one of the developers took the initiative to develop a procedure for automatic testing but in order to ensure its general applicability, it was decided that the writing of the so-called 'test-scripts', which is in fact a repetitive programming task, would be handed over to the team at DIGIT. By writing all the test scripts, the DIGIT team took care of approximately 60% of the total workload required to develop the testing tool. The fact that they were included considerably speeded up the finalisation of this project.

In practice, it appeared that there was a good deal of variety in the way the development projects were organised and this was sometimes problematic because of a lack of information, clarity on roles and decision-making, lacking task specifications, etc. As a result, the degree of formalisation of the work orders, the responsibilities of the project leader and the relationships between the developers at DIGIT could be very different (Flecker & Schönauer, 2007: 8). The reasons for this variety were diverse: a development project depended on the specific product (as well as its history), on the customer, on relationships with Product Management and Engineering or Product Marketing, on the procedures and on the personality of the project leader.

4.3.1.3 Complex work for MESSENGER and standardised work for DIGIT ... and future perspectives

The work organisation at MESSENGER was typically based on a matrix structure and project-based teamwork and this did not change fundamentally with the relocation of the least complex software tasks to DIGIT. The most important impact of the restructuring process was the fact that the MESSENGER software developers were freed from repetitive development tasks. One interesting development, however, as a general trend, seemed to be a shift towards more deconcentrated work models, in what is called a scrum-based development process. In the traditional way of organising the work flow in software development - defining customer specifications, analysing and translating these into technical requirements, developing, testing, writing manuals - problems often arose because additional requirements or new ideas from Product Management and Engineering or Product Marketing were included at the different stages in product development, leading to changes to the plan in the course of the development trajectory. This slowed down the work of the development team and was not very much appreciated by the developers. Close to the time of interviews, the development process underwent a fundamental change from such a linear model to a more iterative and incremental process, called a 'scrum' project. This model was based on a division of the whole project into separate parts for which the traditional process took place during a set period of time (called a 'sprint') involving all the functions and steps in a single team (or 'scrum'). The product was developed in an incremental way and for each step a specific subtarget was defined. During the 'sprint', which lasted one month, there were daily meetings with all staff involved to briefly discuss the progress of the work and issues to resolve. There was no formal team leader and roles were loosely defined. Changes in the design of such a subproject could not be requested until the entire development cycle for the specific sprint was over, and they were only allowed afterwards for the purpose of linking it to the next module under development.

This fundamentally different way of organising the development process meant a more functionally deconcentrated format, with parallel organisation and looser team roles. According to the interviews, this new way of working had the advantage that problems were identified earlier in the development process. In addition, the idea was to share all knowledge between all members of the group. It is important to note that the DIGIT team leader was also included in this new way of working, although he only participated via video conference.

Unfortunately it was too early at the time of the investigation to fully assess the impact of this new way of working on job content, collaboration modes and other outcomes.

At DIGIT, the tasks were more individual and standardised. At the time of the case study, DIGIT only worked for MESSENGER and not for other companies or units of COMMUN. At DIGIT, work commissioned by MESSENGER's project leader was coordinated by a local team leader and carried out by a number of developers and testers. There were twelve software developers at DIGIT. When there was a new project at MESSENGER, the project coordinator contacted the DIGIT team leader to put together a dedicated team. As at MESSENGER, there were three teams that were each dedicated to a project. Each team was composed of about three or four members and a team leader. In general, however, the testing and programming work done by DIGIT consisted of tasks that were carried out individually, rather than team-based. While the programming and testing tasks assigned to DIGIT were the most standardised type of work, it was not the case that the projects involving DIGIT were peripheral for MESSENGER. At the time of the investigation there was a showpiece project running at MESSENGER in which DIGIT was highly involved. This was considered to be an important statement confirming the role of DIGIT in the development process. The DIGIT team was also gradually involved in projects that were run in a scrum-based way. As a result, interaction between the two sites had become more intensive.

4.3.2 Dividing data from data management at EASTTOWN-GBA

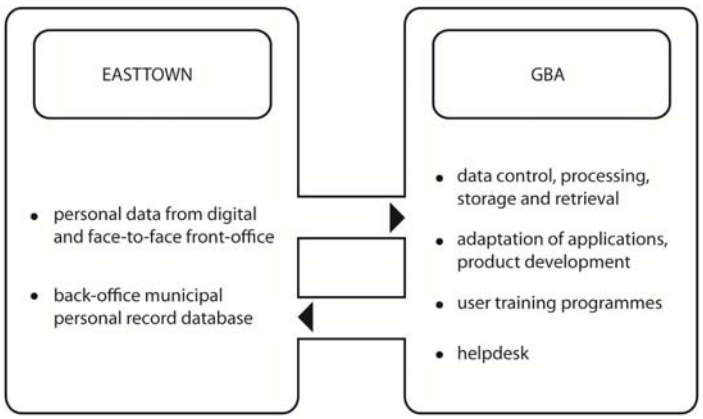
This final case in the sample concerns the decoupling of data collection and back-office data processing, leading to a long-term relationship between two companies where control gradually shifted to the service provider. The EASTTOWN-GBA (Bannink, Hoogenboom & Trommel, 2007) case study provides an example of the complexity of this type of restructuring format and the requirement for coordination that arises from it.

4.3.2.1 Description of the companies involved in the restructuring process

This case study concerns the outsourcing of back-office data processing by a municipal public records service to a private IT service provider. The public records service consisted of three core activities. First, the municipality's physical front-office for face-to-face interaction with citizens who came into report relevant changes in their publicly recorded personal data or who wished to obtain documents that were issued in specific areas of municipal jurisdiction. Second, the municipality's digital front-office allowed citizens to submit new or changed information and to retrieve certain official forms. Third, there was the back-office where the data obtained from both front-offices were processed and stored in a municipal personal records database. In the physical front-office, there were general service desk employees and expert employees. As well as carrying out general desk-based work, expert workers were competent in a specific legal domain and served as a single point of contact between the desk and the back-office ICT-system workers who were responsible for managing the personal record database. The EASTTOWN municipality was highly involved in e-government projects to further digitise front-office functions and back-office data management.

In this context, the majority of the back-office IT-function was outsourced to a service provider, GBA: the data entered in the front-offices were processed at GBA to construct the municipal personal records database.

Figure 4.8 Decoupling data and data management at EASTTOWN-GBA



GBA was a large IT company that built large-scale database systems for public administration organisations, offering modular systems for various applications. These included IT services for the storage and retrieval of information from municipal personal records databases and related systems, as in the case of EASTTOWN. The translation of front-office data into back-office data was largely done automatically if the entry was correct. The system checked for possible mistakes by the desk worker and determined the validity of the input by checking it against the citizen's available data and procedural criteria. One important prerequisite for the database system from the service provider was thus the 'integrity' of the public data and the fit between the data and the system.

Due to this need for data integrity, GBA took control over the entry of data into the system. Data integrity is of crucial importance for service providers. Various procedures within the database system forced the municipalities to comply with strict data requirements. As well as system adjustments initiated by the IT experts employed by EASTTOWN, GBA staff in turn provided regular updates, patches and system redesigns. At GBA, account managers kept the applications up to date with changing legal requirements, developed user training programmes and prepared adjustments in municipal processes to accommodate the implementation of GBA systems. On that basis, GBA's dedicated product developers implemented the changes. Due to this ongoing mutual adaptation, the GBA product developers collaborated intensively with the back-office IT workers at the municipality. The GBA operators also had a helpdesk role. To some extent the helpdesk and product development functions overlapped because the workers at GBA also made adjustments to the system. This intensive interaction ensured that knowledge of the technical aspects of the product was systematically updated to include information about the way in which the system was actually functioning in practice at EASTTOWN. It is interesting to note that a significant number of GBA workers had previously worked in municipality offices.

4.3.2.2 A dynamic relationship between the two ends

The outsourcing of database management to a private service provider while the personal data, which were subject to public ownership and legitimation, were stored at the municipality, resulted in a high level of mutual dependency between the municipality and the service provider and required coordination on different levels. This was even more the case because of the continuous changes in both public regulations (and consequently in data) and technical systems (and consequently in data processing). In this spatial restructuring process, the main change was the decoupling of data input from data processing and management and

the outsourcing and relocation of the latter. Levels of functional concentration remained unchanged. In terms of the technical division of labour, the functional differentiation of the work process increased with the outsourcing and relocation of data management. Nevertheless, the separated functions and tasks required permanent interaction and feedback loops in order to maintain adequate links between them.

Overall, the interaction and interface between EASTTOWN and GBA were highly dynamic because there were constant changes in both data systems and legal regulations. Increasingly, the development and maintenance of the systems developed at GBA required comprehensive legal knowledge, for instance concerning regulations governing municipal population registers, identification documents, naturalisation, etc. Legal knowledge was gradually integrated into the ICT system. On the one hand, GBA was highly dependent on its customer for information on these new regulations and requirements. It was critical for GBA to have this knowledge in house in order to develop and offer competitive systems to the broader market. Whenever new systems were being developed, GBA sought to involve municipalities in the process of defining the product requirements. In order to organise this, a user committee had been established on which GBA and legal and technical experts from municipalities regularly met and discussed (*e.g.* compatibility issues, new regulations and legal requirements, technical demands, etc.). On the other hand, ICT workers in the municipalities also needed to keep their knowledge of the systems up to date and safeguard data integrity. As a result of the intensive interaction, staff in both provider and purchaser organisations gradually obtained and began to use specialised knowledge about the other and collaborated intensively. There were units at EASTTOWN where the knowledge of IT systems and providers was applied, while there were also functions at GBA that applied specialised knowledge of municipal government. This made the boundaries between the private and public organisations increasingly blurred.

4.3.3 Summary: complex interdependencies and iterative distributed work

MESSENGER-DIGIT is a typical example from the IT sector also described in other studies (see Chapter 2) where the work organisation is based on the partitioning and modularisation of work into parts that divide complex development tasks from more standardised development tasks. The last case in the series, on the other hand, is a textbook example of what is called in the literature 'infogérance' or 'IT outsourcing' (see Chapter 2) leading to permanent iterations. This type of restructuring involved the transfer of technical services to a dedicated IT provider on the basis of a long-term contract, leading to the relocation of system management and control outside the organisation. It is also an excellent example of 'stickiness': while it was not possible to transfer all the legal information (the data) to the service provider nor to invest in the required technical competences (data management) within the municipalities, the solution was to decouple the data flow and move the data back and forth.

Identifying changes in the structure of the technical division of labour that accompanied these restructuring cases is less clear-cut than in the previous cases. The reason for this is the complex and dynamic interactions and iterations between the subdivided work flows which each have their respective assets. This leads to permanent interdependencies, intensive feedback loops and iterations between geographically distant units. In particular EASTTOWN-GBA exhibits most clearly the complex and mutual interdependencies that are created by decoupling of functions in complex work flows. In the MESSENGER-DIGIT case, such mutual interdependencies are less marked but the importance of constant and iterative collaboration between the two ends was still characteristic. In both cases there were, moreover,

strong indications of a dynamic and evolving distribution of work between the sites as well as overflows of knowledge and expertise.

As a result of such mutual interdependencies, the outsourcing and spatial relocation of data processing considerably increased coordination requirements at different levels, which will be clarified in detail later.

4.4 Analysis: different formats of spatial restructuring and their relationship with the technical division of labour

The first task of this empirical part was to describe in detail the spatial restructuring processes in the selected cases and to look for related changes in the technical division of labour. Overall, the analysis reveals that spatial restructuring as investigated in different business functions (logistics, production, IT support, software development and customer services) comes in different forms. In the WORKS project, a great variety of global value chain restructuring events at the level of the business functions was also recorded: across all 58 cases, patterns were found of both centralisation and decentralisation and of both outsourcing and insourcing and those patterns varied by sector and country (Huws *et al.,* 2009: 86ff).

As was clarified at the outset of this chapter, we categorised the cases selected for this study into three different types of spatial restructuring. This classification was helpful for the purpose of contrasting the restructuring formats, whereby the first, involving the intended full relocation of a business function, could be distinguished particularly clearly from the other two types that entailed changes *within* business functions. The differences between the second type, the decoupling of one operation of the customer services business function, and the third type, the mutual interdependency and iterative work distribution between the decoupled tasks, are nevertheless also fundamental. Still, most cases show a mix of subsequent and combined restructuring strategies. In WONDERWEAR, production was first relocated with the exception of the complex parts, which then resulted in the enlargement of design and development. This additionally involved redesigning prototype tasks. In CITYLIFE, the customer services function had first been reorganised into a well-delineated deconcentrated and decentralised business function, while in a next step the simplest tasks were decoupled from this and outsourced and relocated. The other cases also demonstrate that restructuring is rarely a one-off operation but rather is a process of consecutive restructuring processes and changes.

We now have sufficient data at our disposal to carry out a more systematic analysis of the changes in the technical division of labour that occur in relation to spatial restructuring.

4.4.1 The relationship between spatial restructuring and changes in the technical division of labour

The first and most important conclusion is that the spatial restructuring did not leave the technical division of labour untouched in any of the cases. The relationship between spatial allocation and technical division of labour can be explained in different ways. Table 4.1 summarises the changes in the production structures, distinguishing between, on the one hand, original restructuring projects conceived by the management and deliberately designing changes in the technical division of labour accompanying spatial restructuring; and, on the other hand, additional changes related to the spatial restructuring but initiated during or after the implementation of the restructuring for several reasons.

In this table, the changes in the technical division of labour, either conceived at the outset or implemented during or after the relocations, are divided into three levels: the level of functional concentration, the level of differentiation between operations of a business function and the level of task specialisation and fragmentation. Upward black arrows indicate an increase in the division of labour (more concentration, differentiation and task specialisation and fragmentation); downward grey arrows indicate lower levels of division of labour.

First, it appears that none of the cases were designed as a pure lift and shift format. Four of the cases involved changes in the level of functional concentration in relation to geographical centralisation or decentralisation. In the cases where functional concentration was envisaged, the expected benefits were rationalisation, increased efficiency and productivity and economies of scale; in the case of functional deconcentration (first restructuring CITYLIFE), the aim was to improve customer services provision for a public service in a context of expanded service requirements. Changes at the level of differentiation were, however, deliberately planned as part of the spatial restructuring projects and this was the case in all but one of the restructuring projects. Changes at this level included shifts from order-based to operation-based flows implying a decoupling of the different operations of the order flows and a coupling of the similar operations for all order flows (FOODLOG), but most of all it involved the coupling or decoupling of a specific operation of the business function. It appears that only one restructuring project, MESSENGER-DIGIT, was designed as a task fragmentation because the standardised part of software programming was decoupled from the rest of programming. Furthermore, FOODLOG was another case where a further fragmentation at the level of the individual tasks of the operation-based flow was planned and implemented. The other cases were not set up with the explicit objective of fundamentally redesigning the individual task composition (level of specialisation) and/or breadth (level of fragmentation). The choices made at the higher levels, however, obviously limited the options when it came to designing these new jobs that were created as a result of the restructuring. In both CITYLIFE and CREDITCARD, for instance, the decoupling and relocation of one function influenced to a large extent the design options for the constituent tasks and the same is true, for example, in the case of DIGIT (relocation of only certain software development tasks).

This brings us to a second rather interesting conclusion: in all cases, the implementation of the spatial restructuring project involved *additional* interventions in the structure of the technical division of labour. On the one hand these were, as has been said, directly related to the choices made in the original restructuring project. Others, however, resulted from the fact that the restructuring project could not be implemented as originally envisaged. In the three cases involved, full functional concentration of all tasks into a single business function was inhibited by specific characteristics of certain operations, information, technical infrastructures, data or competences. These changes were consequently rather unintended. According to the management spokespersons interviewed, the decoupling of specific tasks or operations from business functions was considered to be provisional. None, however, could provide concrete expectations of how provisional this division was. Furthermore, in ITHEALTH the different source companies felt the need to re-install a new (on-site) liaison function, which was then divided again. Other additional key changes include the shift to order-based or operation-based work flows (CITYLIFE, CREDITCARD).

Table 4.1 Overview of the original and additional changes in the technical division of labour accompanying spatial restructuring

Company	Original restructuring project			Additional changes during or after the spatial restructuring		
	Functional concentration	**Operational differentiation**	**Specialisation-fragmentation**	**Functional concentration**	**Operational differentiation**	**Specialisation-fragmentation**
FOODLOG	functional concentration and geographical decentralisation ⬆	shift to operation-based work flow ⬆	fragmentation of the tasks of the operation-based work flow ⬆		decoupling of order release ⬆	
ITHEALTH	functional concentration and geographical decentralisation ⬆	differentiation into functional groups ⬆		(1) remaining decentralised and deconcentrated IT tasks ⇩ (2) creation of decentralised liaison functions ⬆		(1) fragmentation of helpdesk function; (2) fragmentation of liaison function ⬆
WONDERWEAR	functional concentration of mass production ⬆	integration of prototyping operation into Design ⇩				integration of fragmented prototype production tasks ⇩
CITY-LIFE MULTICALL	first restructuring CITYLIFE: functional deconcentration and geographical decentralisation into separate service centres. ⇩	second restructuring CITY-LIFE: decoupling of inbound telephone service and functional concentration and geographical centralisation in MULTICALL ⬆			CITYLIFE: shift to order-based work flow and integration of service functions in teams ⇩	CITYLIFE: integration of tasks ⇩ MULTICALL: (1)sorting of questions; (2) decoupling of question and answer; (3) fragmentation of preparation (4) fragmentation of telephone service in two service levels ⬆
CREDITCARD		differentiation of debt collection operations ⬆			shift to operation-based flow for front-office ⬆	data N.A.
MESSENGER-DIGIT			fragmentation of programming tasks ⬆	implementation of scrum-based format ⇩	gradual insertion of remote teams in scrum-based format ⇩	DIGIT: specialisation of programming task ⬆
EASTTOWN-GBA		decoupling of data input from data management ⬆			(1) blurring of legal and IT tasks in both (2) GBA: gradual integration of development and helpdesk ⇩	

It is evident from the overview that as a result of these combined interventions, spatial restructuring leaves few individual jobs unaffected. In particular, changes in the functional differentiation eventually also resulted in smaller and fragmented tasks, specifically in the FOODLOG BSSC unit, ITHEALTH, MULTICALL, CREDITCARD and DIGIT, which are all destination units. At the source companies, in contrast, changes in the level of functional differentiation led to more integration of tasks and to broader tasks (WONDERWEAR, CITYLIFE). This demonstrates that spatial restructuring may result in very divergent organisational reshapings at both ends of what was originally a single, integrated transformation process. The IT cases, finally, have the particular feature that the new jobs seemed to evolve and converge. Here, increased levels of technical division of labour seemed inevitable and were strongly related to both the technical infrastructures and the specialised expertise required for each of the functions (for example content *versus* data management).

When considering all these related changes that are initiated and provoked by a spatial restructuring project, we cannot conclude that no relationship exists between spatial restructuring and the technical division of labour. Moreover, it is difficult to draw any conclusions on the direction and sequence of the relationship between the two. In several cases (FOODLOG, CREDITCARD, WONDERWEAR, MESSENGER) the initial decision was to carry out the spatial relocation because this choice fitted in with a particular corporate strategy and, as appeared from the interviews, was inspired mostly by differences in labour costs and the search for rationalisation and productivity gains. In CREDITCARD, WONDERWEAR and MESSENGER, the availability of existing capacity (abroad) triggered the redistribution of activities between sites, which was also observed in other restructuring projects in FOODLOG. In other cases, such a conclusion is certainly not clear-cut and indeed it seemed that the decision to restructure simultaneously involved spatial and technical changes or was based on a strategy of reorganising the production structure before it was considered to whom and precisely where the restructured activities could be allocated. This was most marked in CITYLIFE but was also the case in ITHEALTH and EASTTOWN-GBA.

4.4.2 Restructuring: an ongoing process

As already touched upon at the beginning of this section, it appears to make sense to adopt a process perspective in the analysis: the spatial restructurings were not one-off operations but in most cases formed part of a comprehensive corporate restructuring programme, in some cases spanning several years (FOODLOG, CITYLIFE-MULTICALL, WONDERWEAR). In addition, organisations apparently altered the design principles quite fundamentally over these years: both in FOODLOG and CITYLIFE shifts had taken place from operation-based to order-based work flows and vice versa. Furthermore, each individual restructuring event unfolded in stages, which meant changes and fine-tuning in the course of their implementation. This was most clear in the first set of cases where the full relocation depended in practice on the development of adequate technical systems (although management choose not to wait for these) or capable subcontractors. The other cases, however, also exhibited such a dynamic process of restructuring, for instance in the sense that gradually more tasks were transferred to the destination as a result of an optimised knowledge base (CITYLIFE-MULTICALL) or in the sense of growing collaboration and intensive exchange (MESSENGER-DIGIT, EASTTOWN-GBA). Equally, if organisations have multiple sites or longstanding collaborations with third companies, it is easier to move activities around between sites.

The following section focuses on the impact of all these changes on disturbances and how they are regulated. This analysis reveals that additional interventions in the technical division of labour, such as a further functional differentiation, are also provoked by the increase in disturbances, which thus further confirms the dynamic character of restructuring processes and changes in the technical division of labour. This analysis also supports further evidence of the power of the applied analytical framework.

4.5 Detours and disturbances...

As was clarified in Chapter 1, STOSA authors assert that the emergence of disturbances in production processes and the capacity to deal with these disturbances are determined by the way in which tasks are grouped: 'Differentiation and specialization introduce new sub-transformations and tasks that have to be coupled and thus lead to an increase in relations.' (Achterbergh & Vriens, 2009: 252). These relations entail greater risks of disturbances and, at the same time, reduce the potential for regulation. The reason for this is that the tasks involved in producing a single order are highly interdependent. If these tasks are decoupled and distributed across different work flows, this increases organisational complexity and interdependency between, rather than within, work flows. Overall, the more complex the product and process, the greater the requirements that will be imposed on the internal regulation structure. As in the case of the operational structure, regulation can be organised at different levels and increasing levels of functional concentration, differentiation and task specialisation and fragmentation render organisations more complex, which in turn prevents allocating regulatory functions at the lowest level. We have limited our analysis to disturbances directly related to the work flows in a process of restructuring.

Generally speaking, it seems obvious that restructuring operations involving an increase in the technical division of labour will require new and explicit links to upstream and downstream functions. Decoupled and fragmented tasks within a work flow need to be linked and coordinated in order to secure seamless processes. It is expected that geographical distance will add complexity to these additional coordination requirements and will both amplify disturbances between these interdependent but dispersed tasks and decrease the potential to resolve these in a timely and appropriate way. In short, all these links may be marred by delays and bugs, at least during the period of teething troubles during or shortly after the restructuring process. The cases provide ample evidence of such effects.

4.5.1 Loss of overview and detours at FOODLOG

In FOODLOG, partial relocation of the logistics work flow to the remote BSSC and in particular the increase in the technical division of labour at different levels lead to considerable efficiency losses and unexpected costs: container loads were not correctly calculated, information on the time when goods could be delivered was missing, custom forms were missing, empty packages were lost, communication with customers was inadequate, there were delays in transport, etc. These problems, which were more numerous and lasted longer than expected, were related to an important extent to the changes in the work organisation. Before the restructuring process, the employees at the Benelux site had to be able to complete all operations for an entire geographical customer area. As a consequence each customer had a single point of contact. In the BSSC this integrated organisation model was turned upside down with high levels of division of labour. As a result, the individual employees, who were each only responsible for one subtask, lacked an overview of the whole logistics process for a specific order and, which was even more problematic, did not have the

capacity to intervene. This increased work pressure. The problems were summarised as follows by the employee of the retained export unit at the source unit:

> *'Transport planner and order taker work alongside to each other and both are blinded with eye pads. If something goes wrong, each blames the other. If there is a problem they always go back to the order taker because the links in between do not check anything. This is not a good way of working. As a result problems only become apparent at the end of the process in order processing, which is too late.'* (Employee of retained export unit at Benelux site)

A second source of problems was the fragmentation of the work flow due to the fact that not all order processing tasks were transferred and order release was decoupled from the other tasks upstream and downstream of it. This further complicated the whole process and complicated communication on specific orders, leading to ongoing underperformance of the new unit. This was also confirmed by the BSSC supervisor, who passed the buck to the source unit, for instance when orders were released but it subsequently turned out that the load contained the wrong products. His complaint was that the retained export unit still had to produce documents that had to be sent by the BSSC to the final customer, adding complexity and delay to order processing. A final source of problems was the lack of skills among BSSC employees caused by the extremely short training period for these new recruits. We will dig more deeply to look at this issue when investigating the research question on knowledge in the next chapter.

All these problems were an incentive for the management to implement additional regulation mechanisms. The most important of these was the introduction of Key Performance Indicators, which involved systematic monitoring and analysis of mistakes and problems and setting up a rescue team to fight fires and assist the BSSC. In addition, as will be explained later, the new BSSC team informally organised some task rotation with the aim of getting to know the other steps in the flow better and making their own jobs more interesting. Some respondents expected that in the future the work organisation might again switch to an integrated, deconcentrated system for new geographical areas. Other information indicated, on the contrary, that, in line with the work organisation of other BSSC's in the company, further standardisation (a 'unique standard transactional system') was the objective. Neither of these developments could, however, be verified during the investigation.

4.5.2 Unclear roles in ITHEALTH

ITHEALTH also demonstrates how additional interventions were necessary to solve unforeseen problems. First, for the two IT support activities investigated, the functional concentration operation could not be fully accomplished due to the existence of site-specific technological infrastructures and related knowledge among IT employees. To a certain extent, this could have been a transitional situation, except that the local sites continued to acquire and implement their own IT systems. This situation generated the need to keep the previous employees on standby to provide support for the local infrastructures. Another problem was an unclear delineation of roles between ITHEALTH and the various health organisations. This concerned both contractual and technical matters. Since all staff had moved to ITHEALTH, there were no IT specialists left in the health centres to bridge the gap between the service providers and the various departments. Functional concentration therefore meant that new procedures were required to meet additional regulation needs of the spatially dispersed IT business function. This problem was partially solved by creating a specific liaison function between the concentrated IT unit and the different health organisations: the IT

procurers. Since, however, this role was not designed from the start but was implemented as a solution to a 'missing link', the functions of these IT procurers in the different health organisations differed in terms of competences, duties, mandates, etc. In several health organisations, this new function was further differentiated into contractual aspects of collaboration with ITHEALTH and a technical liaison function to collaborate on IT projects on a day-to-day basis. In addition to this liaison function, it turned out that the need for a helpdesk had grown as a result of the functional concentration. As has been explained, tasks were also further subdivided. Once again, the outcome was a detour because internal customers now had to go through ITHEALTH before receiving help instead of contacting their IT staff on site directly.

4.5.3 Broken links at CITYLIFE-MULTICALL

The CITYLIFE restructuring is a useful source of information on some of the unwanted outcomes of spatial restructuring and related changes in the technical division of labour. Before clarifying these, it is interesting to reflect on the effects on customer service quality, because this was the main purpose of the restructuring operation. The restructuring meant that task components belonging to the same work flow were first decoupled and then had to be reconnected using an electronic ticket. This procedure also inserted a time lag between question and response. Overall, based on the interviews, this led to an improvement in service quality in some respects. For most simple questions, which concerned almost half of the 3,500 daily questions, the quality of service had improved considerably thanks to the permanent accessibility of the telephone service. In the case of other, more complex customer requests, the assessment was obviously mixed. On the one hand, responses by the service centre agents could be better prepared. On the other hand, decoupling the question from the answer created a more complicated work flow which affected service quality. As can be predicted from the STOSA theory, this functional differentiation and fragmentation of the preparatory tasks inserted additional interfaces into the process, resulting in bugs that were more difficult to solve. Continuous investment in methods, systems and tools was intended to ensure that none of the information needed to formulate an adequate response to the customer was lost when transferring the question to the service centre. Nevertheless, the link between the person receiving the question and the provider of the response turned out not to be entirely seamless.

First, the time lag between question and response generated frustration for the customer since he or she had to wait for the callback before the problem could be resolved. A second source of bugs in the work flow was mistakes on the callback tickets prepared by the call centre agent on the basis of the knowledge base. Several examples of these will be provided in the following chapter. Third, the call centre agents were literally cut off from the concrete situation in the decentralised service centres and the actions taken by the service centre employees. They lacked an overview of the whole process and of the case. There was no opportunity for systematic contact with the service centre employees. The service centre employees were in turn not always informed either about actions taken by the agents or about what they told the customer on the phone. For example, when service centre employees did not call back, the customer contacted the call centre again and asked why he had not heard anything yet. The agent could see on the screen whether the callback ticket was still open but had no information on why the employee had not yet called the customer. He or she had no idea what the reason might be. The only thing to do was to try to comfort the customer by preparing a new ticket with the same request. Sometimes the ticket was classified in the system as processed by the service centre but the customer contacted the call

centre because he had not received a call. Similarly, a classified ticket might not have been completed by the service centre employee and the agent had no idea exactly what the response was. In some cases, customers called back and told the agents that they did not understand what the service centre agent had told them and asked whether the agent would be so kind to repeat this to them. Of course the only solution here was once again to make a new ticket, redirecting the customer to the service centre.

In short, the callback ticket turned out to be the Achilles heel of the whole system. Mistakes gave rise to additional iterative communications between the call centre, service centre employees and customers and led to a loss of efficiency and effectiveness. With regard to mistakes of this kind we will, in the next chapter, analyse in more detail the effects of this organisational complexity from the perspective of knowledge utilisation and we will look more closely at some problems related to the subdivision of the work flow and employee responses to these.

4.5.4 Time lags causing confusion at CREDITCARD

The CREDITCARD restructuring process was not a success. Several difficulties related to the geographical decoupling of activities ruined this project, and as a result the management reversed the restructuring and reintegrated the front-office and back-office debt collection activities. The majority of the problems were caused by the division and geographical separation of the first and second level debt collection activities and poor digitisation of the files. Despite the clear difference between the nature of the work of first and second level debt collection, problems were initially caused by an unclear division of work. In principle, the front-end did all the work until the payment deadline expired. The back-office then had to take over for more severe steps in the debt collection. In practice, however, this boundary remained fluid and it was not always clear when the work and information should be transferred from the front-office to the back-office. Second, not all the information was digitised and some crucial documents still had to circulate physically. This had a considerable impact on the remote collaboration. The rule was that, until a case was completely closed, all documents had to be physically stored in a single file and put on microfilm. The files and microfilms moved with the first level activities to the offshored call centre, which obviously limited access for the back-office employees. When the people at the source needed a letter from the microfilm, this had to be printed and sent by post.

This problem was aggravated by the fact that there was a lot of non-digital information, in this case invoices, reminders to pay, letters received from or sent to defaulters, etc. Most of the communication with clients still took place in writing, such as registered letters. A lot of these had to be sent backwards and forwards between geographically dispersed units. Very often, crucial information was present at the wrong place and at the wrong time. For instance, the front-end sent a letter at 120 days payment arrears and the client replied 14 days later, although by that time the payment deadline had already expired and back-office debt collection had taken over. The clients did not know whom to contact. Due to the significant delays at the destination, back-office staff often contacted people who had not yet been alerted by the front-office. In the words of one former employee:

> *'It is very difficult to tackle a problem when one part of the solution is located in country A and the other part in country B. The company has become a truly schizophrenic organisation!'* (CREDITCARD front-office employee)

The failure of this relocation was further explained by the underestimation of training needs at both units. All respondents identified the lack of experience as one of the reasons why the interaction between source and destination and in fact the entire relocation process, was not working well. While former employees of the source unit initially moved with the jobs to the offshore call centre, their commitment was low and the turnover high. The shift to a highly monitored, controlled and operation-based type of call centre work had negative implications for their work, which became highly standardised. Furthermore, the equally high turnover even in the next generation of call centre operators generated a continuous need for new information and knowledge transfer, which became poorer as time went on. The operational problems resulting from the decoupling of front-office operations and the continuous deterioration in customer services were the major reasons why the two parts of Credit & Collections were reintegrated after six months.

4.5.5 Moving work back and forth at MESSENGER-DIGIT

As the example on the test scripts made clear, the work assigned to DIGIT mostly concerned specific tasks that were decoupled from the overall work flow and sent to DIGIT. According to common practice in the IT sector, task partitioning and modularisation are based on separating complex development tasks from more standardised and repetitive tasks (Mirani, 2007: 227; Maenen, 2010: 66ff). At MESSENGER, however, this made the whole process more complicated. For instance, if a project was being tested for errors, the tester created an error database, which was then checked by the project manager. The project manager then sent the errors to be corrected to the DIGIT team to fix them. The fixed errors were then sent back to be inserted by MESSENGER staff. A MESSENGER project manager provided yet another example of such a 'detour' in relation to the writing of technical documentation:

> *'The problem is that we have two documents for Product X: one is the user manual, and the other is the installation manual. We have to work on the same document at the same time, but usually I ask DIGIT people to write the documentation and then I have to integrate this revised documentation into the manual. Testing also creates a number of errors in the documentation and if I need to change something in the documentation I have to do it myself or ask the DIGIT people to do it.'* (Project Manager MESSENGER).

The in-house relocation of part of the work flow to DIGIT therefore added an additional step in the development process, leading to back-and-forth transfers of orders and results. In order to support the work flow that was organised remotely, more documentation, bureaucratisation and formalisation of procedures, time expenditure, etc. were needed to bridge the fragmented work flow.

Furthermore, interaction problems were reported by the DIGIT employees, particularly in relation to unclear task demarcations, poorly defined work and lack of an overview of the whole work flow, the product or the precise expectations. The developers at DIGIT faced a high level of variety in the degree of formalisation of orders they received from MESSENGER. Work orders could range from very detailed, extensive descriptions of exactly what had to be done for which product, to very brief verbal instructions over the phone or over VOIP. Apparently, the required information was generally inadequate and unclear. At DIGIT, the developers lacked an overall overview and did not know the objectives of a specific task in the broader context of the customer application. This could not always be blamed on the MESSENGER project leader: sometimes the product that had to

be adapted was old or poorly documented. This led to intensive interactions between MESSENGER and DIGIT in order to avoid or resolve misunderstandings or to clarify precisely what the DIGIT team was supposed to do. Consequently, the DIGIT developers were calling for clear explanations and definitions. Such problems are relatively common in IT development but they were aggravated by the distance and by inadequate communication and thus needed explicit attention. According to both DIGIT and MESSENGER, communication seemed to be the most sensitive point in the collaboration. All respondents at MESSENGER confirmed that transferring the work to DIGIT had considerably increased the need for communication and the requirement to specify and document the work to be done very clearly, making it necessary to write everything down and to make more detailed preparations before the work could be handed over. Furthermore, work had to be checked before it could be finally accepted. Planning also had to be carried out for an additional team.

Overall, this case study clearly shows that the quality of the outcome in the destination unit of an outsourcing or offshoring arrangement was highly dependent on the quality of project management, the resources available for managing a remote team and the contextual conditions such as the state of the product and the documentation and the relationships with actors external to the development unit such as internal and external clients.

4.5.6 Analysis: times, places and structures

Detailed analysis of the cases reveals why restructuring may cause problems that require specific solutions, whether these occur during a transition period or on an ongoing basis. The added value of the applied STOSA scheme is shown to be that it helps to explain and understand the origins of the mistakes and bugs in the work flow. In all cases in the sample it was observed that spatial restructuring gave rise to new problems that triggered the need for additional organisational interventions in order to introduce new opportunities for regulation. The explanation for this is of course that the decoupled activities remained interdependent on each other and had to be (re)connected and coordinated. This was further complicated by geographical distance, which added to the difficulty of resolving problems because remote communication and interventions are more complex and prone to misunderstandings as compared to collocated interaction.

Looking more closely at the disturbances in work flows, however, there are indications that the major problems seemed not to be primarily caused by the (time gap and) distance between adjacent tasks and functions, but rather by the way in which the restructuring process was designed and implemented. In fact, the increased technical division of labour and the way tasks were coupled and decoupled caused most of the disturbances, especially when the restructuring involved a simultaneous shift to an operation-based organisation model and an increased level of differentiation and task specialisation and fragmentation. The most important problems boil down to the loss of a comprehensive overview of the work flow, the broken links between decoupled but interdependent tasks and a reduction in regulatory discretion at these lower levels. The changes in the work flow intensified the interactions between the separated ends and multiplied the number of mistakes, while regulation was also shifted to a higher level. These factors all prevented correct diagnosis of the disturbances by the workers at the outset. In addition, problems were aggravated by the reduced regulation potential that was simultaneously brought about by the same mechanisms.

The outcome was that work was shifted back and forth in iterative processes, often involving several loops before a task could be completed. This was expressed in interviews in FOODLOG, DIGIT, CITYLIFE, CREDITCARD and ITHEALTH. In several cases, 'detour' was a description very regularly used in the interviews, and this was meant not only

in a geographical sense but mainly in a functional sense. Such detours not only led to time wastage but also generated mistakes, with reduced potential to resolve these easily and quickly. This came to the fore particularly in the cases where customers were involved, because the core service function was directly affected by the gap between the question and the response.

In some interviews, for instance in DIGIT, FOODLOG and CREDITCARD, this resulted in strong calls from the employees affected for greater formalisation and clearer instructions and orders, which raises the issue of the responses that are formulated to the increased need for regulation. These responses will now be analysed.

4.6 ... and their regulation

In all cases, a range of interventions were intended to create additional regulation potential and establish functional coordination between decoupled activities organised remotely. These were often conceived from the start, within the overall design of the restructuring project, but sometimes the management also felt the need to intervene during the implementation of the restructuring process and adjust the functional coordination. The emphasis in this section is on the range of formal managerial interventions as related to spatial restructuring. Interventions specifically geared towards knowledge sharing and circulation, as well as employee agency, which are used on a day-to-day basis in response to disturbances, will be discussed in the next chapter.

Overall, the coordination mechanisms observed relate to the functional process and involve operational staff at both source and destination organisations. We will first discuss the range of interventions observed and then describe two illustrative cases in more detail.

4.6.1 A wide range of coordination mechanisms

Several mechanisms identified in the literature are observed in the cases. These can be broadly grouped as follows: (1) implementation of ICTs, (2) standardisation and formalisation of procedures and processes, (3) installation of boundary-spanning functions and (4) installation of dedicated communication channels.

First, it appears that a lot was expected from technologies in terms of integrating information flows and coordinating the work. In this respect, Greenan *et al.* (2009) concluded from their analysis of the whole set of WORKS cases that restructuring is generally supported by dedicated ICT infrastructures (*ibid.*). In the case studies selected for this study, the role of ICTs in bridging time and space was mentioned in several cases, but was not necessarily described as unproblematic and, on the contrary, sometimes added to the problems. The technology supporting work distributed between MESSENGER and DIGIT appeared not to be entirely adequate. Online connections between the two sites remained fragile because of DIGIT's IT infrastructure. Firewalls were very sensitive, connections were too slow and not sufficiently stable to exploit all the possibilities such systems may offer. For example VPN (Virtual Private Network) enabled access to MESSENGER's databases and files directly from DIGIT, but this was not fully operational (at the time of the investigation). Shared servers, files, workspaces and the management system could not (yet) be fully used for distributed work (Flecker & Schönauer, 2007: 11-12). At CREDITCARD, it seemed that ICT infrastructures had been put in place at least at the destination call centre. Here, however, a lot of crucial information was not yet digitised and had to be sent by post, creating obvious delays in the handling of debt collection files, where time is a particularly sensitive issue. In FOODLOG and ITHEALTH, the existing decentralised infrastructures were a key

factor preventing a full-scale relocation. It is noticeable that in these cases management expected these problems to be solved relatively quickly. These overall observations, however, provide grounds to critically question the expectation of the 'abolition of time and space' in telemediated work, which is typically associated with the introduction of ICTs. Rather it seems that while ICTs may perhaps show great promise in terms of increasing communication capacities, coordination capacities are not necessarily improved.

Second, in several cases, original staffing capacity, for example a scaled-down 'rescue team', was kept in place at the source in order to solve the problems created by restructuring or pending full completion of the relocation process. This turned out to be necessary in particular because the required competences had not (yet) been acquired by the destination company, as in the cases of FOODLOG and ITHEALTH. Generally, this type of additional regulation mechanism was conceived as transitory.

Third, it seems that in several cases increased bureaucratisation based on intensified standardisation of processes, more procedures and monitoring accompanied the spatial restructuring process (Flecker *et al.,* 2008). As stated in Chapter 2, standardisation, particularly in the IT sector, may have a 'systemic' meaning, denoting a comprehensive formalisation of the entire development process and covering the whole software life cycle. In the cases in our sample, this types of bureaucratisation and formalisation were found in different industries and business functions and included the implementation of various project management tools, such as feedback loops, detailed time and task recording (MESSENGER-DIGIT), Key Performance Indicators (FOODLOG, CITYLIFE-MULTICALL, MESSENGER-DIGIT), the application of surveillance and control tools (same cases) and so on. As has been stated, in all cases clear explanation and definition of orders appeared to be critical to linking work flows that were fragmented over a distance. In this connection it should be emphasised that such formalisation and proceduralisation were observed at both ends of the restructured work flows. In other words, it seems not to be the case that it was only the destination unit, where a higher level of division of labour is implemented, that faced these organisational responses. The source units also took their share of this development.

In CITYLIFE, this growing formalisation had far-reaching consequences for the team-based service centres. While employees were granted considerable autonomy to plan and organise their work in the new team-based model, they were confronted at the same time with increased bureaucratisation and monitoring of their work caused by the overall standardisation of the work flow, ICT-based tools and data processing systems that underpinned the outsourcing and relocation of the inbound telephone service. Consequently they were subjected to the same detailed service levels and strict guidelines as the call centre agents. Furthermore, there was only a small difference in the level of surveillance between the call centre and service centres. All electronic tickets had a 'traffic light' that switched from green to red if a request was not processed within the 24 hours. This was monitored by superiors and put employees under pressure. They were also subjected to performance monitoring techniques such as 'test customers', 'welcome calls', external assessments, etc. which formed the basis for calculation of their bonuses. Finally, employees at service centres and call centre agents were ordered to check on each other.

Fourth, functional coordination was achieved by creating additional layers in the organisation, such as specific coordination units or boundary-spanning functions. From that perspective, it is interesting to note that additional interventions in the technical division of labour, such as a further functional differentiation, were actually provoked by the increase in disturbances. Putting specific liaison staff in place was a common solution specifically designed to establish operational links between dispersed business functions and intended to safeguard opportunities for regulatory intervention. This was also seen at WONDERWEAR:

with the disappearance of all production activities from the parent company (except prototype production), a specific problem arose: communication between the parent site where design and production preparation were carried out and the actual production sites abroad had become more complicated because there was no longer any experience in relation to clothing production at the parent company. Consequently, possible production problems only became apparent at the offshore production sites. This was resolved by appointing a liaison officer and establishing feedback loops from the mass production sites to the design site. A similar outcome was found in another restructuring case in the clothing industry (Makó *et al.,* 2007).

Sometimes the boundary-spanning function was assigned to the existing first-level hierarchy at the source, meaning that the role of these employees changed fundamentally. This was the case for the former head of the unit at FOODLOG which became responsible for the rescue team. It meant a shift in his responsibilities to managing the practical problems associated with the relocation. The team leaders at MESSENGER were also put in charge of the interface with DIGIT. Their job – at least partly - changed from programming or testing to project coordination, which required different skills. A lot of communication was needed between the team leaders of the different teams involved in the development, who had to set deadlines, monitor delivery times and quality and take the necessary organisational steps to ensure that the work was done as it should be in both teams. A similar trend was observed in ITHEALTH and in CITYLIFE.

The prime example in this sample of specific functional coordination structured at different levels is EASTTOWN-GBA which we will describe below. Furthermore, a final form of greater functional coordination is achieved by creating specific communication channels to facilitate remote interaction, which was necessary in order to fine-tune the distributed work and bridge the distance. An interesting example of such a two-way formalisation process and intense communication was found in the MESSENGER – DIGIT case, which is also presented in more detail below.

4.6.2 EASTTOWN-GBA: complex coordination structures for complex interdependencies

Close contacts, continuous consultation, negotiation and interaction between EASTTOWN and GBA were needed at both operational and strategic levels. These were ensured by a dedicated strategic ICT unit set up at the municipality. Within this unit, a specific development sub-unit was responsible for operational coordination of ICT applications within EASTTOWN and for coordination of operational relations with GBA. At this level, the interaction with GBA was organised as follows. Expert desk employees acted as the single point of contact with in-house, back-office ICT workers. The back-office ICT workers at the municipality actually functioned as GBA system specialists and in turn served as a single point of contact with GBA for operational aspects of data management. Changes in regulations or legal issues were taken up by the competent expert worker and transferred to the ICT workers who contacted GBA support or development staff to adapt the technical system accordingly. If necessary, additional consultation of municipal and/or GBA management staff was provided.

In addition to the need for continuous coordination at this operational level, there was also strong interdependency and interaction between the two parties at the strategic level. This was particularly the case where new systems were used that were developed by other service providers (for instance in relation to the digital front-office). To the extent that these yielded new data input modes, this directly impacted on data processing by the service provider. As

has been stated, however, the service provider controlled the system. The municipal government saw this as a barrier to other system providers and innovation, for instance designing front-offices to suit themselves and changing the way front-office operations generated the data that were fed into GBA's back-office database systems. In response to this, EASTTOWN and a number of other municipalities set up a systematic collaboration in order to strengthen their position vis-à-vis the service providers. One element in this strategy was the establishment of harmonised modular generic ICT systems for municipalities aimed at reducing dependency on specific service providers.

4.6.3 MESSENGER-DIGIT: intensive virtual communication

In all the software development projects at MESSENGER-DIGIT there were intensive exchanges between the teams involved in the project. Especially at the start of the collaboration, joint meetings and one month training course for the DIGIT team leaders at MESSENGER were organised. Face-to-face meetings between the project leader and team leader have been rarer since then but these still took place a couple of times a year. The main communication modes during a concrete development project were chat, which is written communication in Voice-Over-IP systems, and e-mail. Chatting had the advantage that it made it possible to archive the written communication for subsequent use, as the following MESSENGER project manager stated:

> *'There are approximately ten questions a day and if I had to call ten times I would be really distracted from my work all the time. But now, OK, I see it flashing, he is asking a question but I can finish my job first and do not have to attend to it at once. Then I have a look and if I see it is just saying good morning, then I do not have to respond immediately or if the question is not very urgent, I can wait until there are two questions and I can reply to them together.'* (MESSENGER project manager).

Furthermore, weekly telephone conference calls were important communication channels at the management level. In general it turned out that the remote collaboration considerably increased the need to describe in detail the exact specifications of the work to be done. In order to facilitate the documentation of the task specifications, specific tools and languages were used. Nevertheless, respondents at DIGIT reported that these were not adequate and that daily contacts are needed between the developers at both sites.

Sometimes it was necessary for the team leader at DIGIT to contact the customer directly in order to understand what needed to be done. Originally, communication between DIGIT and MESSENGER only took place between the team leaders at each site and not between their respective developers. At the time of the investigation, several initiatives had been taken to improve the formal procedures for collaboration. These included the formal inclusion of the DIGIT developers in the project team (as in the scrum-based development projects), the organisation of formal (although sometimes virtual) kick-off meetings and more direct communication between team members at both sites. As a result the DIGIT employees had more insight into the whole process and the specific characteristics of the product. On the other hand, communication at different levels rather than only between the leaders also increased the risk of confusion and misunderstandings since more people were involved.

Finally, at their own initiative, the DIGIT developers started to build so-called 'user cases' to facilitate feedback and discussion to make the expected functions more explicit. In writing case descriptions themselves and sending these to the MESSENGER project leader for approval, they were responding to the problem of under-specification of assigned tasks. This creative way of working around the lack of formalisation is also found in other cases of

software development and refers to the writing of 'stories' rather than pure technical requirements and specifications. Such user cases facilitate interpretation of precisely what is needed and are gradually fine-tuned in an iterative process (Flecker *et al.*, 2008: 57). Such practices are reminiscent of previous studies described in the first and second chapters that emphasised that it is critical to complement formal and procedural interventions with mechanisms to integrate work in order to bridge the gaps in contextual knowledge and communication.

4.7 Impact on job quality

The final question in this first part of the empirical analysis concerns the way in which changes in the technical division of labour impacted on job quality. Several WORKS reports deal with different aspects of job quality, such as employment conditions (Flecker *et al.,* 2009; Flecker, 2010), health and safety issues and psychosocial risks (Di Nunzio *et al.,* 2009) as well as employee participation and social dialogue (Meil, Tengblad & Docherty, 2009). The last report is complementary in that it provides the analysis of the collective actions of employees and their representatives in relation to restructuring events, which is a form of employee agency that is left out of the present study.

In our analysis, attention is focused on the job demands-job resources perspective and the related conditions for knowledge and skill utilisation. To the extent that spatial restructuring changes the job content, these conditions will change too. As clarified in the first and second chapters, the division of labour at different levels leads to variations in the way tasks are integrated or fragmented. The task structure is decisive in determining the demands of a job. The required skills and knowledge point to required psychological attention and effort and cognitive demands (if tasks are complicated). Integrated tasks providing sufficient autonomy to meet the job requirements may not only prevent psycho-social strain but also support learning as workers have the resources to solve the problems and meet the demands they face in their work.

In order to carry out a detailed analysis of job quality in general and of the balance between job demands and job resources in particular, there are a range of validated measurement tools and instruments. These are based on detailed, validated questionnaires gathering data on a wide range of indicators which are then processed into scores and scales that make it possible to assess and classify jobs according to a range of pre-defined quality dimensions. This type of research requires a dedicated empirical design to arrive at this outcome and is comprehensive and time-consuming. It was not possible to do this in the present study, which means that an exhaustive analysis of job quality according to a variety of indicators was not feasible. Data collection was based on interviews with management, employee representatives and workers. We therefore only have indications of the impact of spatial restructuring on job quality.

4.7.1 Operation-based rather than product-based jobs in FOODLOG

The job quality at the new BSSC of FOODLOG can easily be ascertained from the previous analysis of the work organisation. The shift from an order-based work flow to an operation-based work flow with fragmented tasks meant that order entry, transport planning, handling of certificates and customs and customer service contacts were all assigned to different employees. The tasks for these BSSC employees consisted of only one standardised subtask. As a result the employees had no overview of the whole logistics process for a specific order and were unable to intervene. The fragmentation of the work flow, caused by the fact that

not all order processing tasks were transferred and order release was decoupled from the other tasks upstream and downstream of it, added to the imbalance between job demands and regulatory capacity. This resulted in more stressful jobs with few opportunities to use and develop job-related skills.

As will be described in the next chapter, the employees responded to this situation by adapting the work organisation in order to cope with these stress risks.

4.7.2 Better jobs for the remaining employees at WONDERWEAR

At WONDERWEAR we had no access to the destination companies but the remaining tasks at the source, which formed a coherent set (prototype production), underwent a considerable change because of their integration in another business function, design and development, and due to the broader task composition and greatly increased number of tasks assigned to each employee. As a result, the employees needed additional skills to work with different machines, techniques and fabrics (De Bruyn & Ramioul, 2007c). A training programme made this upgrading possible.

Overall, the restructuring meant a huge change for production workers, who, after some initial resistance, felt that their tasks had become more varied, that they had a better idea of the meaning of their work and that they felt that their skills and experience were being acknowledged and valued more. In addition, both task enlargement and integration with design opened up a range of opportunities for collaboration which did not exist before. Before the restructuring there was not so much interaction between production workers, who were firmly bound to their individual workplace. The collaboration between prototype production workers was much more intense because their work was more complex and varied, as the following interviewee explained:

> *'Now that we are working in a smaller group, you have more social contacts. [When I worked as a mass production stitcher] you only had contact with the colleague who was sitting nearest to you, three metres away, and because of the noise it was difficult to hear each other. Now you have much more social interaction, which is much more pleasant.'* (Prototype production worker)

Prototype production workers also have intensive interaction with pattern makers and designers. As explained in the previous chapters, the job resources needed to face the demands of the job are greater autonomy in task execution and greater task significance, which are the effects of integrated, broader tasks, and opportunities to obtain feedback and support and utilise skills. The job demands had increased as well, since the prototype production workers were contributing actively to the design of new products and to production preparation for the firm's mass production units:

> *'I feel that I have more responsibility, because I know that if I don't do my job correctly, production cannot start in Hungary or China. If the people have a problem in one of these subsidiaries, I will have to deal with the error.'* (Prototype production worker)

Their more complex tasks thus required more cognitive effort too. Overall, the consequence was more active jobs with less risk of stress and more learning opportunities. After an initial period of doubt, the employees assessed the changes as positive:

> *'Since I have been working at the prototype unit, I like going to work again. (...) I have more energy.'* (Prototype production worker). The content of the work was also different in terms of

stress: *'[I feel] a different kind of stress. In the past, you had to make sure you finished a certain number of pieces (...), but now I have to focus much more on the quality.'* (Prototype production worker)

In general it appears that outsourcing the mass production activities in the clothing industry tends to bring about a broadening of tasks for the remaining production workforce at the source, leading to jobs with greater variety requiring more skills (Ramioul & De Vroom, 2009; Di Nunzio *et al.,* 2009). To the extent that workers receive sufficient training to meet these new requirements, as was the case at WONDERWEAR, this can lead to better jobs. This is a direct outcome of the disappearance of the most Taylorised tasks to remote destinations, where both work and employment conditions are quite likely to be less favourable. On the other hand, shorter innovation cycles, broader product ranges, the increased market and customer focus may also entail risks of increased work intensification and more work pressure if these are not in turn countered by sufficient job resources such as support and interaction and training (Ramioul & De Vroom, 2009).

4.7.3 Loss of generalist expertise at ITHEALTH

In the IT sector, it appears that a growing specialisation among IT employees is a more general evolution, not necessarily directly linked to a particular restructuring case (Valenduc *et al.,* 2008). This is also observed at ITHEALTH with the IT employees who were transferred to the new firm, but in this particular case the respondents related the growing specialisation directly to the restructuring. Here it was observed that the persistence of varieties in local technical infrastructures slowed down the trend towards greater specialisation because competence in relation to local systems was still needed. The concentration of the IT support function also had other consequences in terms of job content. These were related to the increased and ongoing standardisation of systems, procedures and work processes introduced at the time of the functional concentration. In combination, the trend towards greater specialisation and increased standardisation lead to less variation in the work and more monotonous tasks. In terms of the job demands-job control model, these jobs evolved towards more passive jobs. Most IT consultants saw this as eroding their competences. Work at the helpdesk in particular was considered to be more monotonous and less interesting than before. For some IT workers, the fact that they were no longer able to be involved in programming work constituted a reason to quit.

4.7.4 Typical call centre jobs at MULTICALL

The tasks of the inbound telephone service were short-cycled, standardised and closely monitored. The call centre agents were cut off from the overall work flow and they had very little informal discretion. Further, first and second line call centre operations were subdivided. Apart from limited on-the-job training, agents also mostly lacked formal support from superiors and colleagues and had no room for planning. This type of working environment creates poor conditions for problem-solving, for social support and thus also for learning. As a textbook-example of a call centre, the situation at MULTICALL confirms that such jobs offer few learning opportunities and entail high stress risks. The call centre agents, however, were newly recruited for this work and overall they considered the work for CITYLIFE to be more complex and comprehensive in comparison with other call centre work that they had done before. This has to do with the fact that there are many different aspects associated with renting a flat from the city. Despite the fact that most information was stored in the

knowledge-base, it did require a certain level of memory and 'brain work', as this agent explained:

> *'OK, the job as such is not so difficult but the specific kind of "networked thinking" one has to develop does make the work rather complex. I am quite exhausted after an 8-hour day working here.'* (Call centre agent)

The agents also indicated that they learned things through this work that were useful for their personal lives: about renting, about construction firms, about insurance, etc. In addition, agents acknowledged that they gained insight into an important part of the city where they live, for example about the vulnerable situations in which people in deprived groups have to live.

Obviously, call centre agents never reached the level of knowledge concerning renting flats of the service centre employees and due to the regulated skill structure and the internal labour market at CITYLIFE there was no opportunity for call centre agents to move to a service centre. When the agents' rather insecure employment conditions and low wages are also considered, it seems that the restructuring brought few benefits for the workers involved in this part of the customer services business function.

4.7.5 A mixed outcome despite teamwork at CITYLIFE

The outcome for the walk-in service centre employees was mixed. On the one hand, they had more autonomy because of the disappearance of inbound telephone calls and the shift to teamwork. This gave the employee more discretion. In practice, the employee could decide when to do the callbacks.

> *'Yes, as I said, I design my own way of dividing up the work. I do callbacks when I have the time for it and I do not have to answer calls constantly [as I did before].'* (Service centre employee)

They also have autonomy over the work sequence*:*

> *'It is very easy. Flexibility is when you say: OK, I have this and this and this on the table; I will do this first, this second and this third. But then something arrives which is more important and the whole plan is messed up and you start all over again.'* (Service centre employee)

The employees were freed from the most standardised and codified, 'encounter type' customer questions that constantly disturbed them in their more complex tasks. As a result they were better able to deal with preparatory tasks and, overall, the integrated 'making', supporting and coordination tasks involved in their job improved their job quality. Autonomy and flexibility also increased because of the shift to teamwork. The division of labour in the team, to which a number of flats was collectively assigned, became client-based. Although tasks were still differentiated on the basis of the required expertise (administration and commercial aspects, technical aspects, practical problems), this model permitted tasks to be assigned in a more flexible way. As one commercial assistant explained:

> *'Exactly, I just pass it on to the housing advisor. I say, OK, this problem is not so difficult, I pass it on and I say: "look, we have this complaint, would you take it over?" When it is office work, like letters to the tenants or an eviction order, I can also ask the secretary to do it. These things are managed within the team.'* (Service centre employee)

The service centre employees acknowledged that they had a better overview of the whole case and the links between the different aspects and fields involved in renting. They further agreed that it was better if the case was handled by a single person, while responsibility could be shared within the team. Finally, the switch to teamwork also created more opportunities for social support and feedback. The overall effect of the restructuring process was fewer disturbances in the execution of the work and more regulation potential. The drawback, however, was greater interdependency between team members, sometimes limiting their autonomy to choose working times and holidays.

Nevertheless, a full picture of their job quality demands a qualified conclusion. Their autonomy was counterbalanced by tight time-frames, increased standardisation in terms of products (case files) and processes (procedures), monitoring and performance systems (and their effects on wages) and the overall work intensification to which they were subjected. Combining all the activities into a fixed weekly scheme placed the employees under pressure. These higher job demands seemed to be classified as 'hindrances' in the sense that they constrained personal development and work-related accomplishment (Podsakoff, LePine & LePine, 2007). These job demands increased stress risks. In all, it appears that the reduced division of labour was only one dimension of their job quality because increased work intensity and standardisation stood in the way of an unambiguously positive outcome.

4.7.6 Freed from repetitive work at MESSENGER, moving up the value chain at DIGIT

From the point of view of the developers of MESSENGER, the collaboration with DIGIT was generally perceived as very satisfactory because they had access to additional, well-qualified and reliable development and testing staff 'on demand'. As a result they were freed from the most standardised and repetitive tasks involved in software development. In the example of the automatic testing, the tester in question was happy to transfer the easy script writing tasks, allowing him to concentrate on the more creative parts of the development work. Overall, the decoupling of standardised and simple work was assessed as being worth the trade-off of added fragmentation and distance in the work flow. In addition, the exclusive access to the services provided by DIGIT helped to keep MESSENGER's costs low. A detailed cost-benefit analysis of four projects that were distributed between MESSENGER and DIGIT by the WORKS team who carried out this case study showed that placing part of the work with DIGIT saved approximately 35% of the total cost that would have been incurred if it were developed at MESSENGER only, even allowing for the time spent on coordination and communication (Flecker *et al.,* 2008: 52).

On the other hand the spatial restructuring of software development tasks definitely also increased standardisation, formalisation and bureaucratisation. To the extent that these enhanced the predictability of the tasks and the information and documentation needed to carry them out, employees were in favour of this kind of formalisation, as it took place at DIGIT. The reason for this is that in a context of unclear task descriptions, greater standardisation and documentation increase control over work. Furthermore, while face-to-face communication was often replaced by intensive virtual communication, the outcome here depends on the quality and performance of communication infrastructures and the flexibility with which these can be used by the employees working remotely.

Despite the differences in job content between the two sites, with more individual and standardised work at DIGIT, the employment and working conditions at DIGIT were also better as compared to the previous data entry work for which DIGIT had originally been set up. At the time of the data entry under the US company, the workload was very unpredict-

able, leading to alternating periods of extremely high workload and periods with hardly anything to do. Now there was more stability as there were always projects running or in the pipeline.[25] Finally, the evolving collaboration with MESSENGER clearly generated additional learning possibilities and some upgrading for DIGIT team leaders and employees. Such a trend of 'moving up the value chain' of previously bottom-end software development tasks has also been observed in other cases (Makó *et al.,* 2007; Galev, 2007; Flecker *et al.,* 2008; Makó *et al.,* 2009).

4.7.7 Mutual learning at EASTTOWN-GBA

At EASTTOWN, the front-office function gradually shifted towards broader tasks. One important driver here seemed to be the growing computerisation and integration of the service provision function. The evolution towards a digital front-office and the implementation of a municipal internet portal increasingly transferred work to citizens. The so-called 'one-stop counter' meant that the range of queries a desk worker had to be able to handle was broadened and contributed towards the changed job profile. The tasks of both general desk employees and expert desk employees also changed, however, as a direct result of the restructuring. The implementation of the GBA IT system entailed a simplification of the legal/content-related and technical aspects of the work. For the legal experts, the ongoing digitisation resulted in a shift from deep legal knowledge of a relatively narrow field towards a more general legal knowledge, supported by ICT-based techniques. Since the system increasingly provided legal checks, it also structured the work and administered the processes. Specialised functions were increasingly transferred to the back-office. In addition, the work of the general service desk employees was less complex from the legal point of view but this was offset by higher demands in terms of customer focus and social interaction skills. Another key change was the growing demand for awareness of contamination of the database system: desk workers were required to verify the authenticity of documents submitted by citizens and the quality of the data entered into the system. In other words, the requirements of the data provider were exported to the civil servants.

These developments were mirrored at GBA. The product developers needed to integrate public regulatory knowledge with IT system knowledge. In addition, product development itself had changed as part of a general trend. There was a more direct link between functional specifications defined through interaction with the customer and development, without the intermediate translation into technical specifications which required high-level programming skills. Product developers at GBA were increasingly capable of working on functional design rather than on technical specifications. Previously, municipal governments had needed to translate legal/content-based requirements into administrative process requirements (and possibly IT system requirements), but now these were addressed directly by the IT provider. The direct translation of a functional design into an IT system required intensive communication between product development and account management as well as the ability to take adequate decisions on the translation of the functional design. As a result, communicative skills became more important.

Overall, the decoupling of data and data processing initiated a creeping shift and mixing of tasks, content and competencies at both ends. Both technical and legal/content-related know-how were gradually transferred between the units. At the operational level this led to increasingly blurred boundaries between organisations, tasks and employees. In addition, the

25 It is important to note that the staff of the 'new' DIGIT were newly recruited software programmers who had not experienced this sitation before the take-over.

decreased knowledge level at the municipalities may eventually facilitate and perhaps even necessitate further outsourcing to IT providers in the future.

4.7.8 Analysis: expectations confirmed

Overall, the cases demonstrate what the STOSA and job quality theories predict. The changes in the technical division of labour deeply impacted the job quality: greater functional concentration, differentiation, task specialisation and fragmentation, which we typically found at the destination units, led to less interesting jobs, more monotony and reduced problem-solving capacity as compared to the jobs prior to the restructuring. In addition, more regulation at a higher level, more procedures and more surveillance were introduced to coordinate the dispersed processes. The workers working in the redesigned work organisation faced greater job demands and fewer job resources, with more stress risks and less learning opportunities as a result. There were several causes for this distorted balance: fragmentation of work, an increased number of disturbances and a lack of overview over the entire work flow, less support and interaction opportunities and a reduced capacity to deal with the increased demand for regulation. This can be seen most clearly in FOODLOG, MULTICALL and CREDITCARD. In some cases, this deterioration in job quality resulted in increased staff turnover (ITHEALTH, FOODLOG and CREDITCARD).

Where the divided work flow simultaneously led to a highly divergent work organisation design for each separated part, a different picture was seen at the source. This was firstly demonstrated at WONDERWEAR but eventually also emerged in most cases. Still, the outcome was sometimes more ambiguous in relation to source companies as well, as in the case of CITYLIFE. This can generally be attributed to the fact that the increased levels of standardisation, formalisation and the implementation of performance monitoring and surveillance tools were used to coordinate all parts of the dispersed production process. Insofar as this increased work pressure affected autonomy, a shift took place in the balance between demands and resources. It should also be noted that, at DIGIT, the employees explicitly requested such increased proceduralisation and standardisation because these reduce uncertainty and lack of clarity about roles and task assignments. To the extent that task ambiguities hinder the accomplishment of the task, they can be identified as deficient job resources and, in fact, themselves become job demands.

In the latter case, the contrast in the overall outcome between source and destination was less pronounced, and the same was true for EASTTOWN and GBA. Here the iterative and intensive collaboration, the high interdependencies between both ends of the work flow and the similar knowledge requirements resulted in less extreme contrasts between the outcomes at the two ends. In these cases, the actual outcomes were also most clearly influenced by some general trends in the fast-evolving IT industry and IT-related occupations, which cannot all be related to restructuring. This was a clear outcome of the analysis of the whole WORKS case study set in this industry (see Flecker, *et al.*, 2008 and Valenduc, *et al.,* 2008).

In the three knowledge-intensive IT firms in the sample and also in CITYLIFE the work organisation involved some expertise-based task differentiation. The teams formed around the integrated work flow included different skill profiles imposing this. Nevertheless, at CITYLIFE the employees worked together in a team with looser task descriptions and shared responsibilities for a number of customers or development projects, which created conditions for knowledge exchange, mutual learning and support. Also at WONDERWEAR, full integration of design and prototype production was eventually limited because the competences of production workers and designers, although complementary, are too different. Here conditions for learning had improved as well.

Overall quite a clear picture emerges: the design of the work organisation and the outcome in terms of job quality differs considerably depending on the position in the value chain, with opportunities for improved job quality at the source companies where workers are typically freed from the simplest and least interesting tasks, and worsened job quality at the other, separate end of the work flow. It thus appears that workers in the relocated jobs not only tend to have less favourable employment conditions (pay and benefits) (Flecker, 2010) and fewer opportunities for employee representation and social dialogue (Meil, Tengblad & Docherty, 2009), but they also face the risks of poorer jobs with less learning opportunities and higher risks of stress.

At both source and destination companies, we also observed some additional changes that might require special attention in future research on job quality trends. Increased customer and market orientation, shortened innovation cycles and speeded-up business cycles may as well lead to more interesting and challenging jobs requiring more skills and involving more teamwork, but may also lead to more intense work, greater time pressure and increased individual responsibilities. Similarly, more standardisation, formalisation and bureaucratisation may perhaps help to enhance transparency, predictability and control, in other words, may help to cope with the increased demands of work, but they also give rise to more monitoring and surveillance. In that case, and this was also an overall finding, those requirements demand specific efforts, attention and skills from workers that may come on top of, or even instead of, the professional requirements. This raises the question of the extent to which an increase of skill requirements is necessarily beneficial if it is the result of work intensification (Ramioul, 2009).

As a conclusion of this analysis on the impact of restructuring on job quality, we can refer to the overall findings of the WORKS report on health and safety issues and psycho-social risks related to restructuring (Di Nunzio *et al.,* 2009). The contrasting outcome between source and destination was one such robust finding. In addition, however, outcomes were highlighted that affect all the workplaces involved in restructuring: 'A clearest and problematic finding is the combined effect of intensification in demands in work and loss of autonomy through an increase in standardisation. This creates a drive towards what Karasek called the most stressful of the four types of organisations described by his model: the "high strain organisation", characterised by a low influence over work and a high demand. (...) During restructuring, workers experience high demands but have no way of controlling what happens, because the procedures are strictly standardised, so they have to adapt passively to changes that become more and more frequent.' (Di Nunzio *et al.,* 2009:73).

Similar conclusions were drawn in a recent study on restructuring and its impact on job quality. Based on the analysis of data from the Belgian sample in the 2010 European Working Conditions Survey, Huys and Van Hootegem (2011) investigated the extent to which employees experienced changes in their job when they faced a company restructuring process. More specifically, the effects of restructuring on psychosocial wellbeing were investigated by analysing the relationship between restructuring and both job demands and job control. Their analysis confirms that restructuring is associated with lower job control and especially with higher job demands. The analysis also shows, however, that in jobs where control over the job enables workers to tackle the increased job demands, this partly compensates for the negative effects of restructuring. On this basis, the authors call for more attention to be paid to the redesign of work organisations and tasks when managing restructuring (*ibid.*: 83, 89).

4.8 Conclusions: spatial restructuring and the organisation

In this conclusion a range of issues identified in the first theoretical chapter are reconsidered. These concern the decision only to consider spatial restructuring events, the use of business functions, the broader theme of organisation and membership, the drivers for changes in the technical division of labour and strategies of autonomy and control.

4.8.1 Differences in economic governance mode

First, we come back to the decision to investigate spatial restructuring events under different contractual relationships between the source and destination unit. The economic governance mode under which restructuring occurred was not a sampling criterion and both in-house relocation to subsidiaries (FOODLOG, WONDERWEAR, CREDITCARD and MESSENGER-DIGIT) and outsourcing to third organisations (EASTTOWN-GBA, CITYLIFE-MULTICALL and ITHEALTH) are included in the sample. Given the focus of this study, we did not analyse the specific contractual aspects of the restructuring cases. This choice was made in order to focus the impact of restructuring on the operational level of tasks, the technical division of labour and the related functional coordination of transformation processes, rather than on the contractual regulation of the restructuring process. The aim in doing this was to take a more parsimonious approach to restructuring and to ensure that our analysis has greater external validity.

The organisation's decisions on the mode of economic governance it requires in activities to reach its goals is likely to be influenced by a broad range of factors. Most of these are beyond the scope of the present study. It is therefore not possible to assess whether and how the contractual relationship specifically contributed to the outcomes of the spatial restructuring events we examined. Nevertheless, including both in the sample gives us the opportunity to compare in-house and outsourced spatial restructuring.

Overall, a detailed assessment of the impact of the governance mode on the outcome of spatial restructuring would also have been complicated. In the cases researched, the so-called third party organisations to which activities were outsourced were not fully independent contractors. ITHEALTH was economically independent but it was founded by the public authority that also owned the health centres with the explicit aim of centralising its IT activities. Equally, the outsourcing of the in-bound telephone service from CITYLIFE took place through a new company, Citylife Customer Services Company, founded by the city council, which contracted out the call centre work to MULTICALL. Citylife Customer Services Company retained a key position in the outsourcing relationship in that it owned the service number and the electronic knowledge base used by the call centre agents. WONDERWEAR, finally, relocated production to both existing company-owned and third party production sites abroad, to which it had access as a result of its long history of mass production relocations. On the basis of the interviews there appeared no clear-cut difference in the assignment of production to either of these due to the economic governance mode. The case of GBA-EASTTOWN also demonstrated far-reaching mutual dependencies between the outsourcing public authority and the third party service provider with complex mutual interdependencies and power relationships.

In this respect, the sample in our study reflects the general outcome of the WORKS project concerning the complexity of power and dependency relations between the parent company and subsidiaries on the one hand and trading partners on the other: 'Hence, for each position in the value chain different forms of economic co-ordination of the organisations involved can be found alongside each other: hierarchical relationships (between parent companies and subsidiaries), market relationships (involving internal, sometimes combined with

external tendering on the global market), long-term collaborations (for instance with specific customers), and ad hoc assignments (*e.g.* to make use of spare production capacities in cases of peak demand)' (Huws *et al.,* 2009: 97ff). In all, a full analysis of the (specific) impact of the changes in ownership accompanying relocations would have required detailed data on the contractual aspects of the restructuring and a specific analysis of economic power and dependency between the companies involved, which was not the objective of this study.

Having said this, the different cases included in our study strongly suggest that the mechanisms that play a role in the functional coordination of dispersed activities are similar in both modes of economic governance. Equally, we observe no salient differences in the way the restructuring is designed and implemented. This can be explained by the fact that these mechanisms primarily concern the functional coordination of the production process, which is essentially a technical and operational matter rather than a legal or contractual one. The latter aspect rarely affects the workers when it comes to the day-to-day practical organisation of the work, as the next chapter will also demonstrate. From this operational perspective, our decision to include both in-house and outsourcing relocations as analytical equivalents cannot therefore be repudiated. In Chapter 1, it was also pointed out that functional coordination may nevertheless include elements of contractual regulation and introduce market-like relationships within the company that directly affect front-line workers. As has been stated, the distinction between 'market' and 'organisation' may become more ambiguous due to the interference of third parties in the internal organisation. Elements of functional coordination are increasingly penetrating into contractual coordination and vice versa. For instance, the use of Key Performance Indicators and Service Level Agreements was found in both outsourced (MULTICALL) and in-house relocations (FOODLOG). In this respect, an interesting key finding from the WORKS analysis of all IT-industry cases was that when acquiring a product portfolio, the high levels of competition found between internal units is similar to those between competitors on the market (Flecker *et al.,* 2008).

4.8.2 Membership and employment regulation

As a second point we reconsider membership, identified as a key dimension of the organisation's boundaries. Due to the decisions to include both economic governance modes and to focus on functional coordination, we included 'outsourced employees' in the analysis on an equal basis with in-house employees, rather than differentiating between them on the basis of their employment contracts. After the analysis, we also endorse this choice. In particular the cases of CITYLIFE-MULTICALL, ITHEALTH and EASTTOWN-GBA demonstrate convincingly that the organisational structures of separate organisations may be closely intertwined at the operational level. In these cases, the relationship between employment contract and functional dimensions of the employment regulation is blurred and one can see a complex interplay between place, contract, work and control. Overall, analysis of the outsourcing cases in our sample confirms that workers at both source and destination companies are to a large extent subjected to the same functional coordination mechanisms necessary to link and coordinate the decoupled functions and tasks. These mechanisms concern ICT infrastructures (data and data infrastructures in EASTTOWN-GBA, software packages in ITHEALTH, the knowledge database and electronic ticket system in CITYLIFE-MULTICALL), performance requirements and surveillance systems, such as Service Level Agreements, time sheets, cost reporting and planning, specific liaison and staff functions, performance monitoring and so on.

While we did not explicitly analyse working time schedules, which constitute an important dimension of allocation and employment regulation, it is plausible that these arrangements

are also harmonised between dispersed units in order to coordinate activities, for example in CITYLIFE-MULTICALL (with the support of the electronic ticket and the associated traffic light system). An impact on working times is most probably more pertinent in cases of spatial restructuring to regions with different time zones. Distant destinations were not included in the sample (or were not accessible, as in the case of WONDERWEAR). We cannot, therefore, assess the impact of large geographical distances on the restructuring outcomes in our study. The international relocations other than WONDERWEAR (FOODLOG, CREDITCARD, and MESSENGER-DIGIT) did not concern moves to another continent and faced time differences of no more than one time zone.

Similarly, we did not find striking differences in outcomes depending on whether domestic or international destinations were involved. Our aim was not to compare the outcomes of spatial restructuring between countries, which would have been necessary if a major research focus had been the impact of institutional regimes for employment regulation.

In Chapter 1, we highlighted the different nature of employment contract and employment regulation as the constituent dimensions of membership, implying that it is not necessary for all employment regulation aspects to be settled where the employer resides. We know from other analysis (Flecker, 2010) that in outsourcing cases the employment conditions differ considerably between source and destination, because such differences often provide the very motive for restructuring. While such fragmentation between employment conditions is, however, obviously most acute between companies and countries, it is also found in subsidiaries that are owned by the same parent (*ibid.*). In other words, employment conditions are not by definition uniform between owned subsidiaries, as was evident at FOODLOG, CREDITCARD, MESSENGER-DIGIT and the remote subsidiaries of WONDERWEAR. Here too, differences in local employment conditions were a key driver of relocation. As concerns other aspects of managerial strategies and employee agency, these will be reconsidered further in the knowledge analysis in the next chapter.

In conclusion, we can state that the cases provide convincing illustrations of how time, place, work and contract become increasingly blurred with the continuing spatial and contractual division of labour, resulting in more complex employment contracts and regulations for the workers concerned.

4.8.3 Understanding the technical division of labour

A third issue in this concluding section concerns the business function concept. In Chapter 1, we questioned the extent to which this is a helpful unit of observation to analyse changes in the technical division of labour in relation to spatial restructuring. Overall, we can say that its main advantage is that it provides an interesting alternative when selecting restructuring cases as compared to entire companies. For the construction of the case study sample it was possible to choose a number of business functions in different companies, which meant for instance that investigating more than one business function in a single company was not excluded. In this respect, the business function may make it possible to focus data collection on a set of coherent activities typically subjected to restructuring as compared to investigating the entire organisation. This makes the business function a practical solution for research, as was also confirmed by organisation surveys on outsourcing and offshoring (De Kocker & Wynants, 2009; Geurts, 2009; Statistics Denmark *et al.*, 2008). In such surveys, the concept is generally well understood by management respondents, which helps to achieve acceptable response rates. In addition, the decision to use changes in the structure of business functions that may transcend organisational boundaries as a point of departure made it possible to include different organisations and their employees in the

analysis, rather than limiting the study to intra-organisational restructuring. This is presented as a major benefit of this approach.

On the other hand, it will be clear by now that the business function concept does not provide sufficient analytical and empirical depth to really understand organisational change. The analysis has to include the levels of tasks as well. Our analysis of the cases with the help of the more fine-grained STOSA scheme reveals that corporate restructuring clearly does not necessarily involve the complete externalisation of an entire business function and is likely to involve differentiation between the tasks of which it is composed. Even in cases where the relocation of an entire business function is envisaged, the work organisation within a business function is for several reasons very likely to be reshaped in its wake, as was observed in the cases. This demonstrates the necessity of analysing the subsequent levels of the technical division of labour down to the level of subtasks. An appropriate, fine-grained analytical framework is needed if we aim to really understand changes in the content of work related to spatial restructuring and how exactly the different tasks are redesigned. The simple observation of the shift of a business function to another place or another company conceals a range of much more complex transformations.

In this respect, we can assert that the analytical scheme as developed in Chapter 1 is adequate and helpful in order to unravel the restructuring from the perspective of the technical division of labour. Identifying grouping principles at different levels contributes to deep insights into restructuring events. Moreover, the model provides a strong comparative tool, both for comparison of changes over time within one company and cross-sectionally. The analysis also shows that the STOSA framework can be used to analyse production processes that are organised remotely and which involve organisations that do not necessarily belong to one company and are located on one site. Since this was put forward as an expected contribution of this study, our results endorse the theoretical and empirical validity of this approach.

Overall, the cases demonstrate how and why spatial restructuring exacerbates the technical and social division of labour. More specifically, and as expected, the specific format of coupling generic system functions to create a set of business functions and then structuring these business functions presents itself as contingent. Business functions are more than just analytical generic categories and sometimes constitute an explicit preparatory step in a broader rationale for relocation or outsourcing.

4.8.4 Reconsidering the organisation and looking for drivers

The criticisms set out in relation to the business function in Chapter 1 also concerned the risk of losing the perspective of the organisation. As has been made clear, core decisions by organisations concern the organisation's primary activities, their functional structure leading to a network of jobs and the allocation of these to a range of membership sets. The management may decide to refocus the firm's strategies on those activities that add most economic value and to reconsider the governance modes of underperforming ones, but they may also decide to alter their functional structure and geographical location. Such decisions formed the point of departure for our analysis. The question is whether it is possible to identify clear drivers and motives behind these management decisions that contribute to an understanding of the spatial restructuring projects.

In the third chapter, we emphasised that the complexity of social reality necessitates prudence when drawing conclusions about linear causalities. Explanations should account for specific outcomes by considering the causal mechanisms at work in particular contexts (Ackroyd, 2004: 152ff). In the different cases, different drivers and contexts can be identified. It is

interesting to consider to what extent these are idiosyncratic or whether they, conversely, exhibit specific patterns.

As a general observation, traditional business process re-engineering rationales typically seemed to prevail in the organisation's decisions on spatial restructuring: expected economies of scale, efficiency gains, cost-cutting and wage benefits emerged as major drivers and objectives. Such motives were not only identified in the large manufacturing companies, which have historically been pushing for increased globalisation, but also in the IT sector and in public services to citizens. The search for productivity gains and (labour cost) savings resulted in decisions to functionally concentrate activities into centralised business functions (ITHEALTH, FOODLOG, WONDERWEAR), to shift towards operation-based work flows (FOODLOG, CREDITCARD, MULTICALL), to fragment and standardise work (FOODLOG, CREDITCARD, MULTICALL, DIGIT) and to relocate these activities to regions, sectors or companies where lower wages can be paid (FOODLOG, WONDERWEAR, CREDITCARD, MULTICALL, DIGIT).

Alongside this general motive of rationalisation, a number of particular conditions can, however, be identified. In our sample of seven cases spread over six different industries, it is not possible to rely upon general sectoral trends to explain the specific restructuring rationale of each company. Nevertheless, a range of particular company-level contextual factors can be identified and some prove to be common across the cases.

In the case of FOODLOG, a comprehensive restructuring programme was induced by a wave of global mergers and acquisitions, necessitating a more streamlined organisation overall. Also in the cases of CREDITCARD, MESSENGER and WONDERWEAR the growth of the organisation led to the reshuffling of activities and the relocation of less complex activities to cheaper regions. The availability of production capacity abroad, whether within the company or in the context of long-standing collaborations with subcontractors, was certainly a trigger for promoting the international division of labour in this way.

In the cases of CITYLIFE, EASTTOWN and ITHEALTH, increased requirements placed on the services provided to citizens obviously played a part, leading to a strengthening of the service provided and, consequently, to reconsidering the organisation of the data infrastructures and facilities that have to support this. In these three cases this involved relocating or concentrating some of the activities. Since public administrations or public services to citizens were involved, it is also interesting to note that, especially in EASTTOWN-GBA, such decisions may be at risk of shifting power balances from the public to the private sector. While the public sector organisations in the three cases were still in a position to define the terms of reference for the collaboration with the service provider, specific types of awareness, precautions and structures were nevertheless needed, and were indeed put in place in order to prevent or limit excessive dependency on the external service provider.

WONDERWEAR had to deal simultaneously with, on the one hand, increased market pressure, shorter innovation cycles and a broader product assortment and, on the other hand, shortage of production workers in the local labour market. This resulted in the accelerated offshoring of mass production and a reinforcement of the development and design function in a single move.

This last case in particular brings us to the observation that, as also elaborated in Chapter 1, drivers other than productivity gains and cost savings can also be identified and must be added to the explanations of the final outcomes of spatial restructuring. These include access to capabilities (knowledge, technologies, staff or other resources), as was illustrated with EASTTOWN-GBA and to a lesser extent in MESSENGER-DIGIT; the retention of key technical skills required for new product market strategies (WONDERWEAR) and the introduction of order-based teamwork to provide a more efficient customer service for citi-

zens in a public service (CITYLIFE) or product development (WONDERWEAR, the scrum-based product development format in MESSENGER).

From these, it appears that other rationales within corporate strategies limit the overall drive towards rationalisation. Quality requirements and the pursuit of high added value activities can be identified as important motives for keeping activities within the company and on site. That was even the case in the clothing company, based in a sector with well-established global value chains, where the treatment of delicate fabrics and the specific design requirements for high-niche underwear kept the company from shifting all production tasks abroad. Similar quality-related motives in products or service provision played a part in CITYLIFE and MESSENGER.

In conclusion, a pattern of restructuring emerges quite consistently. This pattern means that companies combine strategies of increased productivity, reduced costs and increased efficiency with strategies aimed at creating added value in high niche activities, services or products where quality requirements and controls are important. In a context where geographical and contractual shifts of activities are increasingly feasible, this combined strategy tends to lead to the lengthening of value chains with quite different, and sometimes highly contrasting, work and employment conditions at the different positions in these value chains. Nevertheless, a range of contextual conditions will ultimately together determine the eventual outcome of a particular restructuring process.

4.8.5 Strategies of autonomy and control

Looking at the management decisions from the perspective of strategies concerning autonomy and control in the labour process, the cases also provide some strong findings and are fully in line with the above. More specifically, the contrasts between the work organisation designs of the activities separated by spatial restructuring events were remarkable. In the next chapter, we will further explain these contrasts by differences in the specific knowledge requirements of the activities undergoing restructuring processes.

At this stage, we can already draw the conclusion that the cases suggest that dependency on expertise and knowledge, on intensive interaction with customers and colleagues and the unpredictability and uncertainty of tasks increase the probability that these tasks will be kept at the source company. This dependency on workers is consequently approached with a dominant 'responsible autonomy' strategy. In contrast, those parts of the work flow that are no longer physically located at the source location tend to be governed by an organisational design that enables tight control. This supports a conclusion from the study of Marchington *et al.* (2005) referred to in the first chapter. In their research on multi-employer environments the authors observe explicit mechanisms used to discipline employees in relation to growing organisational complexity. This complexity results in greater insecurity about the performance of employees and hence requires a more explicit risk policy towards them. The design of work organisations at several of the destination companies in our sample intentionally relies on a strategy of almost pure control with high levels of fragmentation, standardisation and monitoring and, as can be deduced from the analysis in the context of the WORKS project, often more insecure employment conditions and weak structures for industrial relations. This is indicative of just such a dominant risk policy towards remote workers. We did, however, find divergent work organisation models not only in multi-employer outsourcing relationships but also in within-company relocations. Distance does therefore seem to matter, and perhaps more so than contractual aspects.

At the same time, mixed strategies and constant re-balancing between autonomy and control reflect the dynamic relationship between the management and workers. Most clearly at

GBA, DIGIT and ITHEALTH, but also at MULTICALL and the FOODLOG BSSC unit, as we will demonstrate in the next chapter, the agency of workers contributed towards the final transformation of the labour process. In addition, at the restructured source units, where the workers were faced the rebundling of remaining tasks, workers were not only given more autonomy but were also subjected to new mechanisms of control (CITYLIFE, MESSENGER, EASTTOWN).

Overall, this observation of mixed strategies in restructuring reconfirms a key premise of the labour process approach: autonomy and control are not mutually exclusive but form part of a unified strategy reflecting the primary contradictions inherent in managerial strategies, employee agency and their interaction in the labour process.

In the next chapter we will dig deeper into the relationship between management and workers in the context of restructuring. We will analyse on a detailed level the specific strategies of management in relation to knowledge prior to, during and after spatial restructuring. We will also look at the agency of workers and in particular the practices they develop to contribute their knowledge to the labour process through contextualisation and improvisational work practices. This will enable us to address the final questions in this study.

4.8.6 The process approach

All the cases indicate that it is difficult to identify a clear, conclusive point in spatial restructuring. The detailed reconstruction of spatial restructuring events does justice to the process-based character of the far-reaching organisational changes that they cause. Restructuring is neither a one-off nor a clear-cut operation, but typically forms part of more comprehensive corporate strategies which deserve to be analysed in depth. The drivers and motives behind restructuring, the way in which it unfolds and the additional and corrective actions applied during the process all offer insights into the dynamics of restructuring. The transfer of tasks often occurs in a phased manner, sometimes intentionally, sometimes out of sheer necessity. The difficulties encountered along the way force the management to take additional measures, to adjust structures and procedures during implementation and in some cases postpone or revise the final conclusion of the restructuring operation. This was most clearly observed in FOODLOG, ITHEALTH and in particular in CREDITCARD, where the relocation was reversed. The most illustrative case of the dynamic character of restructuring is provided by the GBA-EASTTOWN case. Here, there seem to be gradual shifts back and forth and increasing blurring of boundaries at the operational level, but there is apparently no definitive conclusion concerning the allocation of tasks and expertise. The collaboration between MESSENGER and DIGIT, however, also developed over time, resulting in a steadily growing role for DIGIT. Even at MULTICALL, as we will further set out in more detail in the next chapter, the call centre agents gradually built up some knowledge and took over more tasks from the service centre employees, albeit in a limited way and informally. The benefits of this process approach will thus be highlighted even more clearly in the next chapter.

5 | Knowledge strategies and agency in spatial restructuring

Introduction

One key question at the outset of this study was whether knowledge can contribute towards explaining the design, process and outcome of spatial restructuring. Not only did the broader societal question on the evolution towards the knowledge-based economy set us on this track, but two notable quotations recorded during the interviews were also inspiring. First, one of the respondents from the management of FOODLOG summarised the company's vision on restructuring as follows:

> *'For simple activities we move the jobs; for complex tasks we move the people. Where there are highly qualified jobs, the people are ready to move and knowledge is therefore mobile. But when activities are not complex, which is the case for our core production process and for some support activities, the local availability of know-how is not a decisive relative advantage and jobs can easily be relocated.'* (HR Manager FOODLOG Benelux site)

Second, the management of both CITYLIFE and MULTICALL explicitly stated that the best idea when it came to reorganising the customer services was to divide activities based on the knowledge required for the service. We quote what the assistant to the director of CITYLIFE said:

> *'The consideration was: how can we relieve employees from the many so-called 'obvious' tasks.'* (CITYLIFE MANAGER)

The call centre management added:

> *'... and so the idea emerged of outsourcing on the basis of differences in knowledge-intensity: very specific questions can be shifted to the call centre because there are many areas in which services can be delivered 24 hours a day by non-qualified rather than skilled staff.'* (Manager MULTICALL)

These quotations indicate that, in these companies, differences in the complexity of the tasks formed an explicit rationale for initiating and designing the restructuring process.

In this chapter we will empirically investigate the role of knowledge in spatial restructuring. In Chapter 2, different dimensions of knowledge and knowledge utilisation were examined and on this basis we formulated three research questions: (1) 'What is the relationship between the knowledge characteristics of activities and the design, implementation and outcome of their spatial restructuring?' (2) 'What management interventions in relation to the management of knowledge are deployed when designing and implementing spatial restructuring projects and how can these interventions be explained?' (3) 'What knowledge utilisation practices are used by workers in the restructuring context and how can these be explained?'.

The extensive analysis of the spatial restructuring events in the previous chapter yields several ways of addressing the first question. In the first section of this chapter we summarise this analysis from the specific perspective of the relationship between knowledge requirements and spatial restructuring. The next endeavour is to look more closely at the second

and third questions by means of a detailed account of how knowledge is utilised and managed in spatial restructuring situations. This is not an easy task. Knowledge-intensity, human interaction, knowledge utilisation are realities that are difficult to observe, especially because business functions being restructured may be composed of a wide range of tasks with different requirements. In answering these research questions, we first analyse to what extent management takes account of the knowledge aspects of the work, either in anticipation of the restructuring or during its implementation. Next, the agency of workers is analysed. In the present study, we only consider individual agency and work practices as deployed in the concrete execution of tasks. Examining the agency of workers in day-to-day work makes it possible to reveal the existence of uncodified knowledge and the way in which new knowledge emerges in restructured transformation processes. The cases in the sample that provide the most informative data on these last issues are FOODLOG and MULTICALL. This part of the analysis will therefore chiefly focus on these restructuring events. Nevertheless, where relevant data are available from other cases they are added to the analysis in order to increase our understanding of the processes that are at work.

5.1 Knowledge requirements and spatial restructuring

In Chapter 2, knowledge-intensity and interaction requirements were identified as two key characteristics to take into account when organising work remotely. From previous research it was found that both types of work are more difficult to relocate because they rely more on the employees' input than is the case in less complex, well-defined manual or cognitive tasks where little interaction is required. As a result, these tasks are more uncertain and unpredictable, and they tend to be more mutually interdependent. Consequently they also require more contextualisation, active use of information from the environment and improvisation, as a necessary addition to formal instructions. It was emphasised that knowledge requirements of activities are also contingent on the concrete organisational settings. Not only the application of codified knowledge but also contextualisation and improvisation are fostered when tasks are integrated rather than divided. The overall hypothesis was that the specific combination of the knowledge characteristics (the type of work) and the organisational structure will jointly define the conditions for spatial restructuring. In this connection several observations are made from the cases.

5.1.1 Reconsidering the sampling

When constructing the case study sample, we selected three types of transformation processes on the basis of their knowledge requirements: less knowledge-intensive work, work where interaction is the core of the work, and knowledge-intensive work. The rationale behind the sampling was to vary the knowledge characteristics of the business functions selected, the independent variable, in order to explain variation in the design of the spatial restructuring, the dependent variable. In order to carry out this theory-driven sampling process we selected cases for each of these types from the case study sampling matrix of the WORKS project that sampled five business functions in five different sectors. The different cells were classified according to assumed knowledge characteristics. For each of the three types of transformation processes, the cases that were expected to be most informative for the expected relationship between knowledge characteristics and relocation were chosen.

When analysing the spatial restructuring formats as intended and as implemented, it appears that similar forms of restructuring take place in business functions that are characterised by different requirements in terms of complexity and interaction. There are similari-

ties in the way the restructuring is designed in the front-line administration of logistics of a large food company, which is considered a 'simple transactional activity', and in the IT services of health care organisations, which were selected because these are knowledge-intensive activities. In both cases restructuring involved geographical centralisation, functional concentration and a shift to an operation-based work flow and included some additional task differentiation as well. Similarly, there is not much difference in the restructuring of, on the one hand, customer services where interaction with customers is the very core, and, on the other hand, production of software where no such customer interaction is needed. Consequently, we find no direct and clear relationship between the generic type of business function and the spatial restructuring.

Given these observations, it appears that the sampling criterion 'business function knowledge characteristics' is not sufficient to explain the spatial restructuring format. However, when we analyse the design and the actual implementation and outcome of the spatial restructuring more closely, differences in knowledge-intensity and interaction requirements emerge quite clearly as criteria and main drivers of the relocation process.

5.1.2 Searching for cut-off points

The explanation is found when looking at the lower levels, the task composition of the business functions. In all cases, except EASTTOWN-GBA which will be discussed below, the tasks that were least complex and required least interaction were decoupled and relocated. Those tasks that were more difficult or required more interaction were most unpredictable and interdependent and those remained at the source.

This is quite clearly observed in the spatial restructurings in MESSENGER, CREDITCARD and CITYLIFE. From previous research it was assumed that for the types of work prevalent in these business functions, a dividing line could be identified, separating tasks according to their complexity and interaction requirements. In CITYLIFE, this dividing line was relatively easy to identify according to the management. The parts of customer services where interaction with customers had the greatest chance of being limited to a one-off encounter and referred to standardised questions and answers were decoupled. In CREDITCARD, the management's assessment was based on a similar idea but in reality the front-office tasks and back-office tasks turned out to be too interdependent to enable a decoupling and relocation of the first. In MESSENGER, as is typical in the software industry in general, tasks were divided according to their complexity, unpredictability and interdependency. In fact the same also happened in ITHEALTH, although in this case this was not entirely as planned: the remaining IT infrastructures at the decentralised health centres implied that not all IT tasks could be centralised and concentrated and that the employees had to continue working at the local sites. Consequently, the actual implementation of the spatial restructuring confirmed a similar separation of tasks. The 'least-likely' cases in the sample are all the more interesting in this respect. Indeed, also at WONDERWEAR and FOODLOG the explanations for the actual outcome of the restructuring are coherent with this: order release at FOODLOG and the cutting of delicate fabrics and prototype production at WONDERWEAR were the most complex tasks and these were not relocated but were decoupled from the transferred work flow.

In all cases, knowledge requirements were decisive for the outcome. The tasks kept at the source had the common feature that the specific knowledge needed led to significant requirements for contextualisation and improvisation, understood as the necessity to adapt the prescriptions by taking account of the specific characteristics of real orders (FOODLOG,

MESSENGER), materials (WONDERWEAR), customers (CITYLIFE, CREDITCARD), data (EASTTOWN) or technical environments (MESSENGER, ITHEALTH).

The EASTTOWN-GBA restructuring process shows much less of a contrast between source and destination and the two activities are on a more equal footing in terms of knowledge intensity. At first sight, this could be a case that refutes the theory because it was the high-level technical competences and infrastructures that were outsourced. As described in the previous chapter, however, the stickiness in this case can be explained by the fact that the data were location-bound at the parent organisation, the municipal administration, while the technical infrastructures to process them were location-bound at the service provider. The type of expertise that was required differed considerably between the two, contrasting legal and technical knowledge. This meant that data were decoupled from data processing. This, in turn, required an iterative work flow in order to take account of the high level of interdependency between the different tasks. In the end, this resulted in a permanent need for remote collaboration.

All in all, it appears that organisations tend to look for the best 'cut-off' point to decouple activities when they are planning a spatial restructuring process. This cut-off point separates activities that can be relocated from those that are kept on site because their knowledge is sticky (knowledge-intensive or interactive) and because this generates interdependency, uncertainty and unpredictability requiring contextualisation and improvisation. This stickiness may not only be anticipated in the design of the restructuring process, but may also be discovered in its implementation.

5.1.3 The work organisation

The eventual outcome of the spatial restructuring can also be explained by looking more closely at the work organisation. When looking at the tasks that were not relocated, the conditions for contextualisation and improvisation for workers to bring their knowledge into work were optimal due to low levels of technical division of labour. Work organisations based on integrated tasks, which were deliberately designed as order-based prior to or at the time of restructuring, explicitly aimed to allow the workers to have the necessary overview of the overall work flow and enable them to plan, prepare and control their work properly, interact with colleagues and customers where necessary and resolve the disturbances that occurred at work.

This was found in the original work organisations at FOODLOG, ITHEALTH and CREDITCARD. In these cases, the work organisations were fundamentally different at those destination sites where the restructured work organisation generated tasks with significantly impaired conditions for knowledge utilisation. In three other cases, the work organisations at the source companies were redesigned simultaneously with the relocation in such a way that tasks became more integrated and this was done with the explicit intention of optimising knowledge utilisation. Most interesting here were the integrated tasks and the setting up of teams at CITYLIFE's service centres and the shift to integrated prototype production tasks at WONDERWEAR. The implementation of scrum-based software development in MESSENGER, however, also provides indications of such a learning-oriented company strategy.

As clarified in the previous chapter, such highly contrasting work organisations at the source and the destination strongly suggest that it was the need for specific knowledge that contributed to the choice in favour of an integrated design, while at the same time the scope to further standardise and rationalise more simple tasks was fully used at the other end of the

transformation process. These restructuring cases therefore exhibit textbook examples of the combination of direct control and responsive autonomy strategies.

5.1.4 Analysis: a dynamic and complex relation

The observed relationship between the knowledge characteristics of the processes under restructuring and the design, implementation and outcomes of the relocation processes makes it possible to accept the hypothesis that the conditions for spatial restructuring are jointly defined by the type of work and the organisational structure. The cases demonstrate that the stickier the knowledge of activities, the more unlikely they are to be geographically relocated. This stickiness is related to both the type of work (interactive, knowledge-intensive) and the task structure as resulting from the technical division of labour. These jointly make activities organisation-specific and 'human asset-specific' (Dibbern, Chin & Heinzl, 2005). In order to fully understand this relationship it is essential to consider the various tasks in a transformation process rather than the aggregated business function. This conclusion is especially relevant for the two least likely cases, WONDERWEAR and FOODLOG, which were included in the sample based on the assumption that they qualified as straightforward relocations of the entire business function.

Despite this overall observation, in reality the direction of the relationship between knowledge characteristics, the technical division of labour and spatial restructuring may be complicated. As was set out in the previous chapter, changes in the technical division of labour preceding or accompanying the spatial relocation might already subdivide the work according to the knowledge requirements, which then facilitate their relocation in a next step. Short-cycled, standardised and fragmented jobs are more easily geographically shifted. Or it may be that the work organisation changed simultaneously with the relocation of the most codified tasks, creating fewer opportunities for knowledge utilisation in the restructured process.

Finally, EASTTOWN-GBA clearly confirms that restructuring also occurs for complex and highly interdependent activities. Even when more than a brief contact is needed and tasks are complex, as in IT software development in general, management does still restructure and relocate activities. In those cases investments are then made in efforts to facilitate communication and to create interaction opportunities in order to secure the generation, use and circulation of knowledge at both sites and between them.

The next section specifically analyses these and other management policies relating to knowledge in restructuring.

5.2 Knowledge management in restructuring processes

As was found in the different studies explored in Chapter 2, the codification of knowledge in anticipation of relocation is an explicit management concern during the preparation and implementation of spatial restructuring. First, the analysis of the cases confirms that codification is not necessarily a preliminary condition and can also be initiated when preparing for restructuring. Based on the existing intentions in this area, for example as expressed in the two quotations at the beginning of this chapter, the management may undertake a range of intentional actions to transfer knowledge from the source to the destination. One specific point of interest is how management handles uncodified knowledge. Interventions based on communication and interactions aimed at bridging gaps in contextual knowledge and fostering mutual learning between dispersed workers will specifically facilitate the exchange of uncodified knowledge (Mirani, 2007: 228).

Second, the management of knowledge is also important because the organisational structure will shape the conditions under which new knowledge is generated in the relocated activities. In the previous chapter it was demonstrated at length how the balance between disturbances and problem-solving capacity and interaction and support opportunities may facilitate or complicate the circulation of knowledge amongst workers.

Third, there may be interventions accompanying the restructuring process in the area of personnel policies. Temporary or permanent mobility of personnel or local recruitment and joint training sessions or mentorship systems involving the employees at both source and destination companies have been identified in previous research as contributing to knowledge exchange in remote working situations.

5.2.1 Discordant knowledge management at FOODLOG

At FOODLOG, the management's strategy concerning the transfer of knowledge was based on the combination of codification of the knowledge required for the logistics operations through the creation of a standard manual on export operations and also on-the-job training of new recruits at the source unit.

In a first phase of this on-the-job training, these new recruits received explanations and had to observe the employees at the export unit. Then it was up to them to do the job under the supervision of the experienced employees. This means that, in theory, this combined strategy targeted the transfer of both codified and uncodified knowledge. In both interventions, however, the employees at the source unit felt that the knowledge requirements and their capacities were underrated and that this approach was consequently inadequate overall. From the very beginning the difference of opinion on the complexity of order processing between the management and employees set the tone for the tense atmosphere in which the restructuring was implemented. The different ways in which the required skills were assessed demonstrates the strategic nature of knowledge in the relationship between workers and management, where the two parties have conflicting interests. This was all the more the case because the restructuring involved the reallocation of the source employees to different units and jobs in the organisation.

When setting up the restructuring, it was the management's assessment of the task complexity, and not the judgement of the workers, that was decisive in determining the initial transfer strategy. First, several initiatives were taken at the headquarters to codify the knowledge needed for export logistics in anticipation of its relocation. An external consultant prepared the relocation by carrying out time studies and a work process analysis at another export unit. This formed the basis for streamlining all the export units that were going to be centralised in the new BSSC. A standard manual on the work process was written for this purpose. The employees and local manager at the export unit on the Benelux site were not involved in these preparations. The reasoning was that the analysis and the manual produced would be applicable to all offshored units. According to one of the export managers, however, the activities on the Benelux site were much more complicated than this analysis assumed:

> *'[The top management] assumed that 85% of the activities were transactional and by definition simple and repetitive. In my opinion this is not true. The export unit at [the other site] has high volume and less complexity, here it is the other way around: high complexity and less volume.'* (Export manager FOODLOG Benelux site)

The fact that the source team had not been involved in this preparatory codification led to a general feeling of frustration.

Second, a further commotion occurred when the profiles of the new BSSC recruits were released. The BSSC recruits were selected on the basis of a single criterion: their ability to speak the language of the source company so that the on-the-job training prior to the transfer would work. No other skills were required and the formal qualification profiles of the BSSC employees were very varied. Third, the on-the-job training for the new recruits was planned to last four weeks. This was considered far too short by the source team to generate any useful knowledge of logistics. The employees admitted that specific diplomas were not decisive in performing their tasks, but 'experience' was deemed all the more crucial for several aspects of the job: product and packaging varieties, customer-specific information, the administrative complexity of some export destinations, the calculations and the 'feel' for loads and lead-times, the local situation in the docks and ports where containers are stored (and get lost) and a range of daily problems that require immediate solutions. According to the employees, these tasks could not be fully anticipated and required the order processors to be experienced. Previously, new staff members basically learned the job by working side-by-side with experienced colleagues. For most of them it took more than a year to acquire the specific knowledge to handle export work. Depending on the complexity of the customer area and the customs and regulation aspects involved in exports, it could take much longer. The staff were deeply shocked that they were expected to transfer all their knowhow to unqualified employees in only four weeks. As a result, the general assessment of the source team was that a lot of knowledge and experience was inevitably lost during the transfer:

> *'You abolish a unit and then you recreate it somewhere else. Nothing is left of the years of experience except four weeks spent together. Let's be honest. That's impossible.'* (Export unit employee FOODLOG Benelux site)

The judgement of the source employees on the competences of the BSSC recruits was harsh and they stated that, despite their efforts to transfer their insights, they had the impression that it was impossible for the BSSC employees to understand the basics of the job, let alone the details, in such a short period. In their opinion the recruits did not have 'the slightest idea' of what logistics is about once they returned to their new unit abroad to start working. The interviews with some of the destination employees acknowledged that not everything went as planned. They admitted that many things went wrong because they lacked knowledge and experience.

The way the spatial restructuring of the export operations was managed also did not provide great opportunities to build up new knowledge. In addition to insufficient codification, the incomplete manual and the short training period, the type of work organisation did not give the new recruits the opportunity to acquire the underlying, tacit tricks of the order processing trade or develop the above-mentioned 'feel for the job'. As has been explained, the restructuring meant a fundamental shift to an operation-based work flow with high levels of differentiation and task fragmentation. As a result, most of the tasks were considered by the BSSC employees to be quite repetitive and boring. The recruitment of additional staff in the new BSSC originally focused on graduates, but it was subsequently felt that this was not necessary. This over-qualification led to high turnover.

During a visit to the new BSSC one year after the original transfer of the export activities we found that nearly half of the original employees had been replaced. This high turnover was considered to be problematic for the operations because new recruits were constantly having to be trained. The BSSC supervisor nevertheless still assessed the required skills and

competences of the BSSC employees as not very high. He still maintained that new recruits could learn the job from four weeks of on-the-job training.

As explained in the previous chapter, the persistent problems in the restructured order processing department urged the management to implement some additional coordination mechanisms. These were mainly geared towards intensified codification and monitoring: the introduction of Key Performance Indicators and systematic recording and analysis of mistakes and problems. In addition, the installation of the 'rescue team' to fire-fight and temporarily help out the BSSC in order to minimise performance losses partially compensated for the loss of uncodified knowledge.

5.2.2 On-going codification at CITYLIFE-MULTICALL

CITYLIFE-MULTICALL was a different type of restructuring process. As has been explained, the management of CITYLIFE intentionally decoupled customer service 'encounters' from 'interactions'. The restructuring did not mean that specific bodies of knowledge had to be transferred from source to destination employees. Rather, the separation of the initial processing of inbound customer questions was accompanied by the codification and digitisation of content into the knowledge base. The work and knowledge utilisation on the two sides were very different and the two employee groups generally did not interact directly with each other, except via the electronic tickets. As the agents of MULITICALL did not have to learn their job from CITYLIFE employees, the assessment of knowledge requirements was not an area of conflict between management and workers. On the contrary, the restructuring freed the service centre employees from distracting inbound telephone calls, which is why they were happy with the restructuring overall.

Nevertheless, both service providers, CITYLIFE and MULTICALL, remained part of the same customer services process and this was also how customers perceived it. The two groups of workers remained structurally linked and customer services consequently still had to be approached as a single transformation process. How can the knowledge requirements of these customer services be assessed? Customer services associated with renting out flats ranges from very short requests for basic information (address, opening hours) which account for more than 40% of inbound calls, to face-to-face meetings between employees of the service centres and the tenant at the other end of the spectrum. The latter took place at the service centre, in the flats or in court. These contacts were intense, personalised and might require multiple follow-up actions. In this interaction, these employees (had to) use the scope available to them as city council officials in the interpretation and application of rules and procedures where necessary and according to their own judgement. The tasks of the service centre employees are typical of this type of interactive, high-end customer services. The employees needed, and were formally given, sufficient time to contextualise the customer request through multiple interactions. This contextualisation was essential because they were responsible for making decisions that could have far-reaching implications for the tenants, as this service centre employee expressed it:

> *'OK, you know you have a certain responsibility and you cannot take decisions lightly. We have to decide whether tenants should be thrown out or not. Often, there are young children involved, so this requires some "Fingerspitzengefühl" [a delicate touch] and decisions cannot be made easily.'* (Employee CITYLIFE service centre)

In view of improving the customer satisfaction, it was clearly not the intention of the management to codify this type of knowledge or outsource it from the city administration to a third party call centre.

In order to separate inbound customer questions and relocate them to the call centre, the entire work flow once again had been analysed, documented and also digitised in preparation for the transfer. This codification formed the basis for building the central knowledge database and drafting scripts to guide call centre agents through customer calls. This was necessary because they were the first point of contact for the customer. Standards were defined and detailed scripts were developed on how to handle the entire customer contact process. This codification was an ongoing process and the knowledge database was constantly revised and fine-tuned. This was discussed at meetings between the team leaders of the service centre, the team leaders of the call centre and the software technicians responsible for the knowledge database. Revisions of content and procedures also took place in response to changes in legal and administrative aspects relating to tenancies, changes in subcontracted technical companies, etc. The call centre agents were only informed of these updates and were not in any way involved in the revisions. Overall, it is clear that management only invested in knowledge codification, by constructing the knowledge base and developing detailed scripts, in preparation for the relocation of the in-bound telephone service, since it was not necessary to transfer bodies of uncodified knowledge in relation to customer services.

Since the work at the two workplaces was so different from the outset, it does not come as a surprise that the required qualifications were also different. About half of the staff at the CITYLIFE service centre had apprenticeships or vocational qualifications, while the rest were educated to university level. New service centre employees had a very intense period of theoretical training at the beginning, but most things were learned over the years by working in the team and on the job. In general, the employees at the service centre identified quite strongly with their status as city council civil servants and evaluated their own job requirements in view of this responsibility. At the call centre, many agents were also educated to university level but this was not what the actual content of work required. Their qualifications were very heterogeneous and were based on specific career paths (students, older unemployed workers, women re-entering the labour market, etc.). The basic competencies were an ability to work with computers and a command of the language. Customer focus was crucial. This also included personality aspects, for instance the ability to control emotions such as anger and impatience.

Normally new entrants received a two-week training course off-the-job where they received basic knowledge on the different areas of customer service. This was followed by a short on-the-job training course. New entrants were seated close to experienced colleagues in order to enable informal exchanges about specific questions and situations. This basic investment in acquiring a minimum level of experience was complemented by some additional efforts by MULTICALL to keep the agents' knowledge up to date. There were regular briefings on changes in the system both electronically and at weekly meetings. Special compulsory tests, such as questionnaires with examples of customer requests, were regularly administered to train agents and test the extent to which their knowledge was up-to-date. The tests had a performance monitoring function. There were also focused off-the-job training sessions on customer focus, handling anger and aggression, talking speed, how to keep the conversation focused in a polite way, etc. Such initiatives were mostly taken in order to correct deficits discovered through individual agent monitoring.

Overall, the two parts of the customer services function were managed in accordance with their specific and very distinct knowledge requirements and there was no direct exchange of

knowledge between the respective workers, despite the structural link between the two parts of the customer services process. At the CITYLIFE service centre, attention was paid to giving the employees sufficient opportunities to acquire and develop both codified knowledge and experience, both through specific training and in team-based work settings, providing ample opportunity for knowledge exchange and learning. At MULTICALL, the strategy was geared towards making the work as independent as possible of the call centre agent's specific knowledge and there was an ongoing codification of content to feed into the knowledge base. This ongoing codification meant a gradual transfer of (digitised) knowledge from the service centres to the call centre.

5.2.3 The other cases: mutual learning and gradual shifts of knowledge

The FOODLOG and MULTICALL cases involve tasks that were considered not to be complex and the knowledge was therefore expected to be relatively easily codifiable and transferable. This was also stated by the respective spokespersons and reflected in the management's policies concerning the transfer of knowledge. An interesting counter-example comes from WONDERWEAR, where the restructuring strategy was not based on maximising codification but on the full recognition and exploitation of the knowledge and experience of prototype production workers by giving them greater autonomy (De Bruyn & Ramioul, 2007c). In this case the codified parts of production had, of course, already been relocated to mass manufacturing centres abroad and the knowledge management only concerned the remaining, more complex and vital activity of prototype production. Indeed it is precisely because of the importance of their knowledge and experience in producing high niche clothing and the growing scarcity of those competences in the regional labour market that these workers were asked to collaborate with the enlarged design department.

During that process, the experience and tacit knowledge of production workers were fully valued in their own right. The prototype production workers were involved in the design phase by giving feedback on the 'produceability' of the new models and, as a result, they fully participated in the innovation cycle. In preparation for this operation, several of the mass production workers who joined the prototype unit had to be upgraded. To realise this, the management organised 12-week training courses which were given by the most experienced prototype production workers. During the courses, the production workers had to produce a number of pieces from start to finish. They received assistance from the experienced prototype workers. If they needed more time to learn all the new operations, they were allowed to extend the training period. According to the workers, these training courses were very useful and helped them to master the integrated tasks. An additional strategy to foster skills and learning was the close contact and exchanges with the designers:

> *'We have more contact with the designers now, because we have to collaborate with them to develop the prototype. They tell us how we have to stitch it and what it should look like. In the end, however, we often have to ask them ourselves whether what we are doing is OK.'* (Prototype production worker WONDERWEAR)

At ITHEALTH, MESSENGER–DIGIT and EASTTOWN-GBA, the restructuring processes involve IT work which is characterised as knowledge-intensive. In the two latter cases, this is reflected by the fact that the remote collaboration required permanent intensive interaction and communication as well as regular mobility and on-site presence of staff. Even in these knowledge-intensive cases, however, codification was important prior to and during the restructuring. The MESSENGER-DIGIT case in particular demonstrated how remote

collaboration contributed towards greater codification, for instance in the distribution, accounting, monitoring and filing of the tasks. According to the project manager, the relocation of work led overall to increased documentation of all the work at both sites. This means that even at MESSENGER the time spent to do the work had to be registered at a detailed task level, since this was also the practice at DIGIT. Furthermore, the scripts provided by the DIGIT team were stored in a specific database. In order to be able to test the scripts developed at DIGIT, MESSENGER's system had to be adapted to fit the database specifications. Finally, the collaboration involved the creation of a continuously updated and detailed overview and documentation on progress of script writing work, as well as a procedure for feeding back to DIGIT on the accuracy, quality of their scripts. In all, the transfer of part of the work led to the development of common tools, methods and procedures to monitor and control the work done at both ends. This highly formalised the work at both source and destination and structured the collaboration between the teams.

In addition to this codification, however, explicit attention was devoted to putting in place conditions for social interaction to facilitate knowledge exchange and contextualisation as was explained in the previous chapter: regular communication opportunities at all operational levels, gradual involvement of the DIGIT teams in the overall software development, working groups including both teams that actively sought out ways of improving communication and collaboration, etc. The DIGIT developers also contributed to creating such conditions, as was illustrated by their initiative to collect more adequate and detailed information on their assignments by writing user cases. As a result, the destination unit gradually succeeded in becoming a more important partner in the software development process and even began having direct contact with clients. In this respect, reference can also be made to some of the studies cited in Chapter 2 emphasising that integrative mechanisms necessarily have to complement the, equally necessary, codification processes which typically precede the offshoring of complex and highly interdependent tasks.

It could not be verified to what extent this process evolved further until both partners shared equally in software development in terms of complexity. Some other cases do suggest such a trend (Makó *et al.*, 2007; Galev, 2007). In the literature this is generally referred to as a process of moving up the value chain (OECD, 2007; Makó *et al.*, 2009) and it points at the dynamic character of this type of relocation process.

Obviously, provision for close interaction and sharing of knowledge in the design of the restructuring process was most pronounced at EASTTOWN-GBA, where a mutual learning process and a gradual, but extensive spilling-over of specialised knowledge from one unit to the other were prominent features. The setting up of 'user councils' at GBA for product development, which included experts from the municipalities, was a concrete example of such a knowledge exchange forum. Further it was remarkable that former EASTTOWN employees were apparently working at GBA. This is the only case in the sample were such a more balanced distribution of knowledge was observed from the outset.

5.2.4 Analysis: combining codification and knowledge sharing - but not for everyone

Efforts at explicit codification are essential when transferring knowledge over a distance and this could be easily identified in all cases. It may be achieved by analysing and documenting the work flow and by producing manuals or digitising content and constructing knowledge databases. Broader initiatives to standardise and formalise the processes and the remote collaboration, as well as training, also contribute towards codification. Training also makes it possible to share uncodified knowledge, especially if interaction opportunities with experi-

enced workers and some room for practice are explicitly provided. At FOODLOG, this was evaluated by both tutors and pupils as largely insufficient to generate an adequate transfer of knowledge. Other initiatives that take account of uncodified knowledge include establishing systematic information flows based on both formal and informal interaction channels, social relationships and workforce mobility. Such interaction and communication opportunities were only created in the IT cases and also at the service centres at CITYLIFE. An obvious factor to account for this is in these cases the management assessed this knowledge as vital to the organisation's performance and was in fact subordinated to the professional expertise of these workers.

The intentional establishment of learning-oriented settings between dispersed sites was not seen in the less knowledge-intensive parts of the transformation processes. This may not come as a surprise when considering the management's assessment of the knowledge requirements of these activities. The intentional decoupling of simple from complex tasks at both FOODLOG and MULTICALL made the setting up of systematic mutual learning structures redundant. In both cases, higher levels of division of labour reduced the skills, training period and experience required and were thus likely to further widen the gap between the employees at both ends of what had formerly been a single transformation process.

The cases also show that codification was not a one-off intervention but continued after the restructuring, whether in the same format (see the ongoing updating of the knowledge base at MULTICALL) or through additional interventions, such as by establishing monitoring systems and Service Level Agreements. Codification thus seemed to trigger further codification and involved not only the destination but the source as well. This can be explained by the fact that in practice the remote processes remained interdependent and effectively interconnected. This also required additional functional coordination efforts. Such interdependency apparently occurs not only in 'software related tasks 'by their very nature' (Mirani, 2007: 216), but also in customer services covering a wide range of interaction requirements and in the type of administrative processes that we found in logistics.

Overall, the data suggest that, not surprisingly, the actual assessment by the management of the knowledge requirements of a transformation process is decisive in determining the knowledge management strategies taken prior to, during and after the restructuring. This assessment is directly reflected not only in the choices concerning the technical division of labour but also in the efforts to transfer the knowledge to the destination, in the recruitment profiles, in the design of the restructured activities and in the knowledge strategies set up to serve these. As has been demonstrated, the different assessment of the knowledge requirements for the constituent tasks of the business function resulted in highly contrasting designs between the two ends of the transformation process, distinguishing a strategy of maximising control over knowledge and workers at one end and optimising knowledge exchange at the other.

The next task is to dig deeper into the worker agency deployed in response to increased codification and control. This last step in the analysis will contribute towards understanding the eventual outcome of the restructuring processes, even where this was not completely conclusive.

5.3 Uncovering uncodified knowledge and worker agency

The very nature of uncodified knowledge makes it difficult to observe it and to report on its specific features. While it is possible to ask about formal interventions and management strategies in interviews, accessing uncodified and in particular tacit knowledge is a different

matter. The data collection was not specifically designed to observe knowledge and was based on interviews and not, for instance, on direct observation. Consequently we have to rely on a range of indirect indicators.

First, workers may report at interviews on decisions taken in the course of task execution that refer to contextualisation. Improvisational work practices, which are not necessarily tacit but may be uncodified for the management, may also be uncovered in interviews. Second, improvisational work practices and contextualisation are likely to come to the surface during codification processes accompanying the transfer of work. This is especially the case if efforts to codify knowledge are inadequate: if the transfer of knowledge is incomplete the relocated work process will not function very well, at least initially. Mistakes related to knowledge deficiencies may be strong indicators that uncodified knowledge has been lost. In addition, the responses of workers in order to compensate for such knowledge deficiencies are informative. Employees may actively initiate attempts to recover lost knowledge when they are confronted with problems and disturbances during their work. Improvisational work practices may be deployed in view of an experienced need for contextualisation. The active agency of the workers is by definition central to this part of the analysis.

5.3.1 Lost knowledge and appropriation at FOODLOG

5.3.1.1 Incomplete knowledge transfer

In the interviews the employees of FOODLOG first reported that, over the years, they had developed their personal work practices to handle specific situations and problems in order processing. One employee said:

> *'Sometimes problems occur which are not anticipated in the procedures but for which you still have to find a solution. For instance, a container with return packaging is lost on the quayside in a port and then it is up to you to figure out where it is coming from and where it should go.'* (Export unit employee FOODLOG Benelux site)

All of the employees interviewed explained that it had taken them quite a while to develop their own 'best way of working', which included the setting up of specific, personalised systems and tools, such as small notebooks or electronic files, to keep track of order processing and to store information about customers, forms, customs officers, etc. They had also developed their own shortcuts in the whole process. In other words, there was ample evidence of practical knowledge necessary to execute every order, contextualise it and resolve unforeseen problems by means of improvisation, which was necessary to complement the formal instructions. These working practices were not necessarily undocumented, but they were still highly personalised and they were generally not shared with superiors or even amongst colleagues.

Second, the importance of tacit knowledge is demonstrated in the fact that the different tasks of the order processing are described in terms of 'experience' and a 'feel for the job'. The export manager asserted:

> *'Order release is also a question of your feel for the job and your experience: you know what products are stocked, what is missing, and so on. It is a question of feeling whether an order can be released. This is often neglected when these huge projects are designed from the top.'* (Export manager FOODLOG Benelux site)

The following anecdote is illustrative. In the wake of one of its comprehensive restructuring plans, the management had decided to move the production of one of the beverages to another site. The required product quality and quantity could not, however, be achieved. This led to a product shortage. Experienced employees in the export unit, who were aware of this problem, engaged in negotiations with their customers to replace the missing product with another one, rather than let the customer wait for a next production batch. In this way, a number of company objectives were met: satisfied customers, sales of alternative products to the missing one, and full rather than half-full containers for the order. The employees could not imagine that the new BSSC staff would be able to react in a similar way after their limited training period and in a work organisation where they did not have an overview of the entire logistics workflow.

Third, the loss of practical knowledge among employees in the export unit was revealed in the number of mistakes and problems that occurred once the new BSSC unit became operational. An overview of the most frequent problems and mistakes was recorded by the export unit employee from the rescue team and reported to the BSSC as an action list. In the previous section, a number of these mistakes were directly linked to changes in work organisation and the incomplete transfer of the logistics process, causing a loss of the overview over the work flow and a reduction in regulation potential. Other mistakes can specifically be related to the loss of knowledge. A number of problems were caused by wrong information, *e.g.* communicating the wrong location to the transport company or the customer when orders are being prepared to be picked up, and problems related to certificates, customs or excise documents. Others specifically revealed the lack of experience, for instance miscalculations of container loads, lead-times or delivery schedules. The head of the replenishment unit gave this illustration:

> *'We release an order and then we notice that all the materials ordered do not fit into one container. (...) Or we see that they told the transport company that the order is ready, but they stated the wrong location. (...) This still happens in, let's say, 15% of all cases.'* (Head of replenishment unit FOODLOG Benelux site)

The manager of the retained export department added:

> *'The agreed procedures are not followed by the BSSC because they interpret them differently. SLAs are signed between departments, which stipulate for instance 'we need 48hrs to release an order'. In the BSSC, however the client was told it will be ready in 24hrs. Why? Because they do not dare to argue with the client (...) or because they made a mistake. This upsets our system. In local order processing you can resolve these kinds of problems by calling the client to tell him that there is a delay. In export, however, the logistical chain is so extended and the volumes are so large that you cannot instantly change orders.'* (Manager, Export Unit FOODLOG Benelux site)

The asset manager added:

> *'Such a large number of mistakes would never have been acceptable if it were a new team member at our unit.'* (Asset manager Export Unit FOODLOG Benelux site)

The loss of experience and knowledge was also acknowledged at the BSSC. The employees admitted that it was not easy to complete the export activities:

'At the beginning it was chaotic because (...) the containers were dispersed all over the place in the ports, which costs a lot of money. I had to resolve everything. Now I have developed my own way of working.' (Order processor FOODLOG BSSC)

The question remains of the extent to which these deficiencies were eventually assessed as problematic by the top management. At least they were not defined as insurmountable since, according to the local head of unit, a loss of cost-effectiveness for work transferred was calculated from the start and was expected to be transitory. One employee asserted:

'We have heard from colleagues that the management took into account a loss of customers and efficiency because of the transition. I think the loss must be considerable. When you consider that some containers were only 10% loaded!' (Export unit employee, FOODLOG Benelux site)

The supervisor at the destination also assessed the initial problems as teething troubles.

5.3.1.2 From implicit resistance to collaboration

The agency of workers in relation to knowledge transfer during restructuring was noticeable. Despite the difficult circumstances surrounding the way in which the restructuring was announced and implemented, employees at the source export unit attempted to secure and transfer some of their uncodified knowledge to their successors. Initially, there was an overriding sense that they were teaching people who were going to take over their jobs and who were not at all qualified to do so. Motivation was therefore not very high and some employees admitted that they did not explain very much to the new recruits about what they were doing.

Nevertheless, after a while several of them eventually prepared some notes during their own time on how they work, on their customers, their specific geographical area and specific customs and excise requirements, etc. in order to help out the new team. They also emphasised that they were available to be contacted afterwards, which also did happen. Overall, the employees at the source site, since they were proud of their work, were willing to share their experiences and contributed at their own initiative to the codification and transfer of their practical knowledge and improvisations. Overall, although it was too short, the entire on-the-job training was recognised as an important way of transferring uncodified knowledge, as the BSSC supervisor asserted:

'Training manuals [prepared on the basis of another EU export unit] give you step by step information about the whole process but they don't say which customer is a pain in the ass. The training manuals don't say what you have to do when things go wrong either. Sitting next to the person who had been doing the job for years was much more useful, they have their shortcuts and so on.' (Supervisor FOODLOG BSSC)

At the new BSSC, the workers interviewed reported that they also gradually found out how to organise and document their tasks in order to solve problems. In addition, the new team, acting informally and at their own initiative, arranged a kind of task rotation with the aim of getting to know the adjacent steps in the flow better and making their jobs more interesting. This was mainly a response to the frustration they experienced because of the obvious differences between their work and the tasks they had observed during the training course at the source export unit. Since order processing was order-based, the source employees had a deep knowledge of the specific customers in their area, as well as all aspects of order processing as a whole. This was in contrast to the work organisation at the BSSC, where employ-

ees were only allowed to carry out one task, for instance entering orders, producing certificates or organising return packages.

5.3.1.3 Looking for explanations

The collaborative behaviour of the order processors at the source site is remarkable since, to begin with, these employees were losing their jobs as a result of the relocation and were either given early retirement or assigned to another job in the company, usually a less interesting one. Moreover, the definition of skills related to the work was a key element in the conflict with the top management over the relocation process. The explicit actions taken to help out the new BSSC employees can be explained in different ways. Firstly, there was some internal competition between the team members of the unit undergoing restructuring concerning the jobs to which they would be allocated once the export activities had been shifted entirely to the BSSC. Overall, there was not a very strong team spirit and this was certainly not strong enough to allow for effective collective action against the top management's restructuring plans. The employees also did not feel that they could rely on the broader trade union to respond to the comprehensive restructuring programme, since they were only a very small unit of seven persons with specific problems. The relocation of their tasks was an irreversible fact and, consequently, the individual and collective negotiations on the restructuring mainly concerned their internal re-allocation and the preservation of acquired rights. Overall, collaboration in the restructuring appeared to be a more effective strategy than resistance.

Second, the choice to support the BSSC recruits can be regarded as a strategy of reconfirmation of their own competences in a situation of virtually open conflict over the definition of skills. More broadly, this apparently collaborative behaviour in fact reasserted the worker's ultimate ownership of the actual tasks and the knowledge these required. In this respect, the support of the local management in assessing the skills of the team and implementing the restructuring process certainly contributed to this reassertion.

Third, since they gradually changed their attitude towards the BSSC recruits from resistance (a passive attitude in on-the-job training) to collaboration, it seems that the destination workers were eventually perceived as colleagues rather than competitors. In addition, the source employees had also developed strong loyalties towards their customers over the years. This suggests that the interaction during the on-the-job training triggered a pragmatic attitude towards 'their' labour process, their new colleagues and their export customers. This attitude took precedence over open or covert resistance to the top management's project, which was in any case perceived as pointless.

5.3.1.4 A short digression on 'the culture of New Capitalism'

The reconstruction of the FOODLOG restructuring process illustrates how big the gap can be between the top and the bottom in a global company. On the one hand there were the huge and comprehensive company reorganisations, conceived and designed centrally and imposed on all lower levels. The main drivers were financial objectives and the aim of establishing an integrated organisation and smooth, efficient production processes while controlling all costs. On the other side was this small team, which faced the effects of this policy. The restructuring deeply affected all aspects of their working lives. The evolution of FOODLOG from a locally embedded, traditional firm that gradually came apart at the seams, to a global company trading on the stock market is a typical example of the transition to financial capitalism, where the corporate rationale is mainly aimed at making profits for shareholders. In his book 'The culture of the New Capitalism' (2007), Sennett describes the

key characteristics of new capitalist cutting-edge companies as contrasted with traditional vertically structured bureaucracies.

Several of the trends the author distinguishes can be observed at FOODLOG. The major orientation of the new corporation towards short-term shareholder profit ('impatient capital') has profound implications for overall company policy. The most important rationale seems to be to demonstrate (to shareholders) the presence of dynamism, change, flexibility and risk-taking rather than stability, resilience and security. Change and insecurity were ubiquitous in the globalised company. Comprehensive, often drastic, reorganisations were based on successive, objective-driven projects that left few workplaces unaffected. The objective was the establishment of a flexible organisation, made up of dynamic, contingent combinations of spatially dispersed units, rather than a vertically integrated bureaucratic and pyramidal hierarchy. In the 'old' FOODLOG, internal labour markets were well established. These were based on relatively low entry barriers, company-specific qualifications and experience, loyalty, seniority and relatively clear internal career paths. Jobs were more or less stable and predictable. As described by Sennet: 'In the chain-of-command pyramid, you do your duty and fulfil your function, and eventually you are rewarded, as the holder of an office, for performance and seniority, or passed over or demoted' (Sennett, 2007: 50). The new HRM policy, on the contrary, opted to gradually replace the traditional workforce, often comprising lower or medium-level clerical staff, by high potentials that were highly mobile. Management conceived 'structural insecurity' as a main driver of better performance. Decisions to change seemed to be mainly based not on legitimate authority but on power without accountability. Sennet refers here to the systematic use of external consultants to do the 'painful work of restructuring' (*ibid.*: 56). This was also the case at FOODLOG where the successive reorganisations were also enforced by anonymised centralised decision-making structures and levels, rather than guided by the direct boss or manager. The shift from an order-based to operation-based work flow, for example, was also difficult for the unit manager to understand. Strategic objectives were formulated for all levels and Key Performance Indicators served to monitor progress quantitatively.

This corporate strategy clashed with the reality on the work floor, which still bore the features of the bureaucratic model. The contrast between old and new was also apparent in the opposing perspectives on the work. The employees emphasised its complexity, the frequent need for ad-hoc interventions and the skills needed to solve these and to make the process work at all. They were concerned to manage these daily disturbances effectively. The management considered these as transitory and made allowances for the associated costs and efficiency losses in the overall balance. Their main concern was the overall financial objectives. The costs of reorganisation, also in terms of temporary underperformance, apparently were not a decisive factor. The use of Service Level Agreements and Key Performance Indicators were considered to be sufficiently efficient ways of ensuring that the local levels would act in line with the overall objectives as far as possible. The expectation was that the new work organisation would work out well in the end. Furthermore, this restructuring was eventually only temporary since the implementation of automated systems was envisaged and further relocations were expected as the next steps towards a fully integrated logistical flow of goods and information.

There was also a gap between the continuing loyalty of the employees to the company and the global HRM objectives, which were based on dynamism, change and structural insecurity. For the employees involved, the prospect of new restructuring processes would probably require even greater flexibility and loyalty in the future. Sennet predicts that such a new flexible corporate model leaves little basis for building up loyalty, trust and institutional knowledge: 'The virtue of the pyramid was, however, accumulation of knowledge about how

to make the system work, which meant knowing when to make exceptions to the rules or contriving back-channel arrangements' (*ibid.*: 69). The author emphasises how such vital institutional knowledge is built from the bottom, and not imposed from the top. It was this kind of knowledge that seemed to be at risk of getting lost in the overall drive to shift activities to where they cost the least. Finally, in these new corporate environments, Sennett observes that experience, skill and quality-driven craftsmanship, defined as 'good work for its own sake', are being substituted for 'potentials, capabilities and functionality-driven' outcomes. Craftsmanship defined in this way seems to 'sit uneasily in the institutions of financial capitalism' (*ibid.*: 105), because deepening ability through practice and experience is difficult to reconcile with flexibility, change and mobility. His rule of thumb that skills require '10,000 hours' cannot be verified for the work of the export unit clerks, but the contrast between the couple of years asserted by the employees and the four weeks estimated by the management was nevertheless striking.

The employees, most of whom had long periods in service, were very much aware of this growing distance between themselves and the company management. However, they still tried to make the best of their jobs and they were still proud of their work. They basically remained aware of the importance of their contribution, however small, to the functioning of the whole logistics process. Thus, as far as we could observe, loyalty seemed to be obstinate, although it was clearly affected and jeopardised by the restructuring process.

5.3.2 The emergence of improvisational work practices at MULTICALL

5.3.2.1 Not a seamless process

In this customer services case, the importance of uncodified knowledge is most apparent at MULTICALL, precisely because the tasks that were transferred to the call centre were assumed to be highly codified and perfectly transferable from one worker to the other. We summarise a passage quoted from an interview:

> *'The advantage is that the service is not dependent on the agent or on his or her knowledge. When the address and the service domain are entered, the electronic ticket is automatically sent to the competent walk-in centre employee. (...) The agent can therefore concentrate fully on the actual conversation with the customer. (...) Consistent quality can only be achieved if the service is not dependent on who answers the call and if the scope for (mis)interpretation is reduced to a minimum.'* (Manager MULTICALL)

As has been described, a neat cut-off point between the two contrasting types of customer service was envisaged: the customer question was processed and codified in the form of an electronic ticket while the service centre agent contextualised this by talking to the customer.

When looking at the process in detail, and especially at the problems that occurred in the preparation of the ticket, it turns out that the reality was less seamless. First and foremost, the call centre agent had to rely on a personal interpretation of the customer's message. The fact that this personal interpretation was not entirely predictable became apparent in that it was often difficult for the service centre employee to understand from the electronic ticket alone what solution was needed. A typical case was that customers exaggerated the urgency or seriousness of a defect, which was difficult for the agent to assess. As a result, for instance, the wrong technician was contacted by the service centre:

> *'The customer says there is a big hole in the wall and then I send a tenant notification to a contracting firm to repair this, but then it turns out that it is just a tiny mark caused by a hammer and a nail. The tenant*

could have repaired that or we should have sent a painter rather than a construction worker.' (Call centre agent MULTICALL)

Difficulties in processing the ticket also occurred when customers asked to speak to a specific service centre agent and refused to give any more information on the subject of their concern to the call centre agent. Furthermore, agents made mistakes with names, telephone numbers and so on which were reflected in the ticket. Inexperienced agents made a particularly large number of such mistakes. One technician complained:

'I receive a notification that there is a dead mouse in the elevator so I send both the elevator company and a technician. The first has to lock the elevator; the second has to climb into the elevator shaft to clear away the mouse. Then there is no mouse. Later it turns out that it was in another building!' (Technician CITYLIFE service centre)

A second range of problems was related to the fact that the knowledge database contained a lot of mistakes and had to be constantly updated. Finally, as has previously been suggested, these problems were aggravated by the fact that there was no feedback loop between the service centre and the call centre and no opportunity for systematic contact between the two ends of the customer services process.

All these examples demonstrate that, although it probably did not affect the majority of the inbound telephone calls, dealing with customer calls was eventually not such 'an obvious task' as the management had predicted. The dividing line between the two ends of the workflow was constantly shifting. The gradual updating of the knowledge database, as an ongoing codification of knowledge, resulted in gradually more questions being solved at the call centre at the initiative of the agents. But the examples suggest that it will never be possible to anticipate all types of problems and that this would continue to create misunderstandings at the service centres.

5.3.2.2 Corrections to the course

In response to the grey area between encounters and interactions, the call centre agents developed several work practices that enabled them to cope better with two contradictory organisational expectations: acting as described by the scripts according to the service levels (quantity) and being customer-friendly (quality). In this conflict of roles, the agents often gave priority to the customer and took into account the fact that supervisors were well aware of the deviations from procedures this might cause. They considered that it was necessary to deviate from the guidelines in order to help the customer out:

'I worked in a bank before and there I learned that the customer must leave calmly and with a smile on his face. This is my motto and it works here too. And to achieve this you sometimes need "corrections to the course". Every modern aircraft sometimes requires corrections to the course, even when it is technically perfect. This means that you have to think for yourself how to act.' (Call centre agent MULTICALL)

The improvisational work practices were diverse. First, the call centre agents reported that it was difficult to stick rigidly to the communication scripts provided by the system. For instance, the welcoming sentence was considered too long. Similarly, agents used their own words because they felt it was more respectful to the customer and also more effective than a prescribed formula. This was especially true in the case of angry customers. Second, if a customer kept calling the call centre back, the agents eventually helped the customer directly, although this was officially not allowed, because they felt this was the quickest way to solve

the problem, for example by giving the telephone number of the repair company. Third, they sometimes provided support that was not in the knowledge base, as is demonstrated in the following illustration:

> *'I have to be careful about providing information that I am not strictly allowed to, but I do it anyway. Not big secrets but small things, for instance: one customer complained about noise from a neighbour below him and that this problem never gets resolved despite earlier interventions. I advised him to take out legal protection insurance and told him that after three months, he could take the case to court. There were other cases like that. I know I was not allowed to do this but I felt so sorry for the poor devil who called me.'* (Call centre agent, MULTICALL)

Fourth, experienced agents confessed that they did not always rely on the knowledge database. It was not essential to understand the structure of CITYLIFE in every detail in order to give the correct answers. One call centre agent explained:

> *'It is like a dictionary, it would be too long-winded to start searching with no information, you have to know precisely where to look to find the information (...) but you know most things after a while, so that you do not have to check all the time.'* (Call centre agent, MULTICALL)

Experienced agents organised their workplace to their own satisfaction so that they had all the necessary information close at hand, for instance by printing out pages and posting them by their desk.

Finally, call centre agents often entered into conversations with customers who just wanted a chat. A considerable proportion of the tenants in the city flats were old, lonely or had problematic personal or family situations. In those cases it was difficult to focus the conversation on a problem that had to be recorded on an electronic ticket and stick to the maximum call duration. Some agents concluded that the disappearance of the janitors from the estates was part of the explanation for why tenants call the call centre to find a listening ear. In this connection they realised that they, not the service centre employees, were the first to encounter 'weird' or difficult customers and that they had to quickly find a proper way of dealing with them. In such cases, informal contacts between the call centre agents were the only way of coping:

> *'When you happen to have a call from a weird person and you do not have a break coming up to discuss this with colleagues, it is certainly good that you can talk to your neighbour.'* (Call centre agent, MULTICALL)

5.3.2.3 The customer is always right

The explanations for the improvisational work practices at MULTICALL are not entirely comparable with what we observed at FOODLOG. Here, the employees were not in the midst of a company restructuring, but were rather benefiting from it in that they got the new jobs thanks to the restructuring. For some of them this was an opportunity to get into more interesting call centre work as compared to what they had experienced before. By changing the way they interacted with and helped out 'their' customers, the agents changed the relational and task boundaries of the customer calls in order to resolve the inherently contradictory expectations of their job. The range of improvisational work practices developed by these call centre agents were, firstly, focused on achieving a minimum of contextualisation for the customer question in order to be able to provide a direct response, even if this response might later turn out to be wrong. Second, as in FOODLOG, the pragmatic inter-

pretation of the prescribed tasks was rooted in a fundamental empathy towards the customer that was generated during the short contact. Speaking to the customer directly called upon their basic customer-oriented attitude, which was ultimately a key selection criterion required to get the job.

All the improvisational work practices were used because the employees made use of the minimal discretion available to them whenever they could. In the end, it was not the computer but the call centre agent who had the discretion to decide to either give the answer or forward the customer query to the service centre. Furthermore, human interaction can never be fully standardised. It was still essential for the workers to 'think for themselves'. The improvisational practices contributed towards restoring some of the lost social interaction with the customer and appropriating their identity as a customer-oriented agent to some extent. Due to the limited resources available to the agents, this behaviour did not always work out well, for instance when the information given to the customers was not confirmed by the service centre employees afterwards. Finally, it remains an open question as to how the gradual enlargement of the knowledge base, with more codified content and increasingly stricter monitoring and surveillance, will eventually affect this minimal discretion and improvisation on the part of call centre agents.

It was noticeable that the call centre management did not systematically intervene to prevent such personal initiatives, as long as these improved the customer contact and service levels were reached. On the contrary, there are indications that the management were informally gratified that agents made their experience count. The over-qualification of most of the agents turned out to be useful in the end.

5.3.3 Analysis: collaboration and appropriation

The analysis of the restructuring cases on a deeper level provides several additional insights into workers' utilisation of knowledge in general and in situations of organisational change in particular. Two striking observations are firstly the development of new learning through work practice by workers, even in standardised and short-cycled tasks, and secondly the active agency of workers in the restructuring process.

5.3.3.1 Dialectics of deskilling and upskilling in codified knowledge environments

One conclusion from Chapter 2 can convincingly be confirmed from this in-depth analysis: even tasks that are highly codified, fragmented and short-cycled contain elements of uncodified knowledge and, consequently, knowledge codification strategies are limited. Codification is by definition an incomplete process and provides only a temporary solution in rendering knowledge formalised and stored so that it can be 'utilised without the participation of the knowing subject' (Hirsch-Kreinsen *et al.,* 2003: 27-28). The implication of this is that codification initiated or advanced in the restructuring process actually gave rise to new needs for contextualisation and improvisation, which was found at both destination sites. New knowledge emerges through activity, whether this concerns well-established work processes or newly designed ones as a result of deep organisational change. This section clearly demonstrates that this is true for less knowledge-intensive work and for highly fragmented jobs.

At FOODLOG's new BSSC and at MULTICALL, the two destination companies on which we have focused this part of the analysis, the basis for such knowledge generation is found in different types of improvisation. These originate from an experienced need to make the best of the job, to do 'good work for its own sake' (Sennet, 2007: 105), and to achieve a minimum level of intellectual activity and job satisfaction. From observation of the contingencies of actual task execution, the *modus operandum*, knowledge utilisation is a reality in all

specific configurations of the labour process. The improvisational work practices point towards the intrinsic orientation to create use-value in the labour process, even under conditions where it is commodified. Critical realist authors define the power of workers to conceive their tasks before executing them as real and human. This power consists of 'powers of *imagination, creativity and ingenuity'* (Fleetwood, 2004: 47, italics in the original). These powers are no less real in simple tasks as compared to highly complex tasks and they do not stop existing in labour processes that generate the former. Otherwise: 'If workers did not have these powers there would be no point whatsoever in even contemplating HRM practices' (*ibid.*). The actual 'unleashing and harnessing' of these powers (*ibid.*), however, is contingent on the organisational conditions defined by the technical division of labour and related personnel policy practices and these will generate effects in particular configurations and specific contextual conditions.

High levels of division of labour leading to small and highly fragmented tasks may exacerbate alienation at work and generate corresponding needs for appropriation of work. The building up of 'institutional knowledge' may be jeopardised in such organisational settings, especially when employee turnover is high and a restructuring process is defined as a transitory moment pending subsequent restructuring. This contrasts with the more systematic, formalised and comprehensive conditions for knowledge utilisation and learning found at EASTTOWN-GBA, CITYLIFE, to a certain extent at DIGIT and even at WONDERWEAR (this other case of less knowledge-intensive work). This difference is related to the contrasting organisational structures of these units and the formal installation of knowledge utilisation and learning opportunities. Here, learning is part of the job description and conditions are explicitly put in place to realise it: sufficient levels of discretion are granted and interaction with colleagues are facilitated and these actively support contextualisation and enable improvisation where and when they are needed.

According to authors writing on the labour process approach, intrinsic learning at work sheds a different light on processes of deskilling typically associated with standardisation and fragmentation of work (Thompson, Warhurst & Callaghan, 2001; Sawchuk, 2006). The agency of workers remains fundamental, even in informal ways, and use-value production in the labour process therefore includes '(...) the many skills that are central to production, not (yet) appropriate-able by capital and those that management rejects altogether' (*ibid.*: 611). Still, denoting such emerging new knowledge as 'upskilling' may be a step too far, not least because these skills are not formally recognised and rewarded by the management and because there are no indications of the extent to which they facilitate upward mobility or lead to a higher salary. Rather, one might speak of a pragmatic and situated learning which has direct functionality for the worker in his or her day-to-day work and life.

5.3.3.2 Collaboration and appropriation in restructuring

To what extent the observed limits of codification are problematic for management is another question. The inevitable teething problems apparently did not prevent restructuring. The cases suggest that management included temporary performance losses in its restructuring plans and speculated on a more or less spontaneous generation of new knowledge at the destination sites. At MULTICALL, 40% of in-bound telephone calls were simple, one-off encounters, and for the other questions there were the gradually improving knowledge base and the overqualified agents. At FOODLOG, the functional concentration and centralisation of order processing was just a first step awaiting a full operational ERP system. Transition periods were explicitly scheduled and possible losses calculated in advance, even if they were apparently underestimated. Specific interventions permitted some fine-tuning and adjustments to the implementation and codification efforts continued after the restructuring.

Interestingly, in both the cases analysed in depth, but also for instance at DIGIT, the individual initiatives deployed by the workers were indeed functional for the management's objectives and contributed towards performance at the restructured workplaces. This active contribution towards the process and outcome of restructuring is interesting to explore further and leads us to uncover the various layers of the social reality found in the labour process. At FOODLOG, the source employees gradually participated in codifying their knowledge and documented their well-established improvisational work practices in export order processing in order to share these with the inexperienced BSSC recruits. At the BSSC unit, these new recruits also developed their own ways of improving the efficiency of the operation-based order processing and found ways of crafting their fragmented tasks which were experienced as all too boring. At MULTICALL, the call centre agents helped to achieve the company's objective of high-quality customer services, as far as this was possible in a context of highly prescriptive scripts and a tight timeframe (a three-minute call). At MESSENGER-DIGIT the active agency of the employees, at both ends, was also an important element in the outcome of restructuring. The initiative of the software developers to write user stories, the mutual investments by both teams in more efficient communication channels and the joint efforts made to codify forms and procedures to achieve better fine-tuning of the work once again come to mind in this respect. The systematic interaction between the two teams also contributed towards the development of this mutual support and knowledge sharing. A similar commitment in terms of knowledge-sharing and interaction was found at EASTTOWN-GBA.

In a situation of conflict but also more generally, this collaborative agency observed in restructuring processes is worthy of particular attention. In Chapters 1 and 2 we asserted the criticisms of the 'assumed collaboration' in inter-organisational restructuring and knowledge codification strategies which are made by some theoretical approaches. Rather than assuming that workers are prepared to share their knowledge with the management to meet the organisation's objectives and to collaborate unconditionally in restructuring, we followed the labour process approach, which indicates that in reality cooperation and compliance coincide with resistance and conflict. While we did not observe manifest collective actions to oppose the spatial restructuring projects in our sample, we can, however, obviously not conclude that there was unconditional tacit consent either. The observed improvisational work practices and the pragmatic behaviour of codifying and transferring personal knowledge are only to a certain extent compliant with the company's objectives. The worker's ultimate discretion continues to exist, in the same sense as the 'power of imagination, creativity and ingenuity' referred to above, and it implies that workers retain their capacity: '(...)to use their precious commodity in non-capitalist productive forms as labour beyond capital, which is the capitalist's dread' (Rikowski, 2002, cited in Sawchuk, 2006: 604). The reality on the shop floor is complicated and the observations in fact address the very heart of the contradictory position of workers in the employment relationship.

Indeed, collaborative attitudes and behaviour equally contributed to 'maintaining a reasonable environment of human interrelation with clients, colleagues or distant colleagues' (Sawchuk, 2006: 604). Such a reasonable environment includes a basic orientation to look after customers and colleagues, an attitude that predominates over compliance with overall company objectives. As Delbridge (2004) observed in his study on the behaviour of peers in team-based settings, looking out for the customer and considering the overall quality of the service provision has an inherent legitimacy and workers identify more easily with quality goals than with other management objectives (Delbridge, 2004: 270). In other words, they develop a 'process ownership' rather than an 'organisation ownership'. While such compliance with quality goals and customer friendliness may exert control and lead workers to

behave according to expectations, in all the restructuring cases observed workers did not prioritise organisational objectives over their own, independent choices and agency. In contrast, this agency of workers simultaneously reasserted their ultimate ownership of the work and knowledge. Consequently, this tendency to maintain a reasonable working environment is not to be interpreted simply as unambiguous subordination to the management's orders and expectations.

Referring to the concept of appropriation as explained in Chapter 1, the agency of workers exhibited in the two cases tends towards the active recovery of some autonomy over work (Fleming, 2001: 190-1, cited in Thompson & Smith, 2010: 19). This strategy of appropriation concerned the product of their work and their work identities. This contributed towards the eventual production, reproduction and transformation of the restructured labour process, even though this contribution was highly conditional upon the actual, quite limited possibilities offered by the organisation.

At another level of explanation, the aspect of 'calling' and the impact of human interaction cannot be eliminated from work and is essential in the generation of sympathy, which as has been said is not necessarily directed towards the boss but all the more so to colleagues and customers. Referring to social psychological theory, Baumeister and Leary (1995) demonstrate how people seek to fulfil a basic need for connection to others and this 'need to belong' results in people forming social bonds even under adverse conditions. Simply being frequently exposed to others tends in itself to induce attachment (*ibid.*: 520). From this perspective, the interaction requirements of specific occupations and activities plays a role in a very broad range of jobs, not only service jobs, where workers interact with others.

In conclusion, the observed, multi-layered forms of the agency of workers refer directly to indeterminacy. Collaboration does not devalue the ultimately open-ended nature of the employment relationship and the different types of behaviour displayed by workers point towards an active awareness, agency and appropriation of the work in contexts involving major transformations of the labour process.

5.4 Conclusion: explaining the contradictions

The analysis of the restructuring cases at a deeper level, where we examined the knowledge strategies of management and knowledge utilisation by workers, provides several additional insights into knowledge in work generally and in restructuring situations in particular. This additional analysis has made it possible to identify different management strategies aimed at transferring and securing knowledge. It was also possible to discern several methods in which workers develop their own, practical ways of managing and transforming their tasks and how this leads to knowledge utilisation and learning.

When reconstructing spatial restructuring from this perspective, the distinction between the ways in which the management understands knowledge and the workers' practical skills came to the fore. Diverging assessments of skills requirements played a prominent role in the design, preparations, and implementation and in the (unintended) outcomes of the restructuring process and can consequently be identified as a key factor in relations between management and workers. Basically, all the cases included in the sample demonstrate how the assessment by the management of the required skills forms the basis for designing the restructuring process but also shows that this only makes it possible to a limited extent to understand knowledge utilisation in practice and thus to understand the eventual implementation and outcome of restructuring. In other words, this assessment by the management provides only the initial and temporary basis for the restructuring. The fact that the map

designed by management is not the territory trodden by workers reasserts the indeterminacy of the employment contract.

As regards the management's knowledge strategies in restructuring, a mixed approach was adopted as has also been seen in other research. Generally, knowledge management in restructuring tends to be tuned coherently to the distinct strategies of control and autonomy deployed at either end of the subdivided transformation process. Referring back to Chapter 1, Marsden (2004: 81) emphasised how both enforceability and efficiency are necessary to realise a workable employment relationship, where efficiency relates to the fact that the competencies of the workers must be relevant and appropriate to the specific requirements of the production structure. Still, just as we observed mixed strategies in relation to autonomy and control in the previous section, the reality is also more ambiguous when it comes to knowledge management. Particularly at MULTICALL and also at the new BSSC, at DIGIT, and, as the case report suggests, at ITHEALTH, deviations from the official instructions were at least tolerated if not implicitly encouraged by management in order to achieve a less disturbed and more efficient work flow, even in organisational structures that create poor conditions for knowledge utilisation and learning.

As for the agency of workers in restructuring, the findings point directly towards the indeterminacy of the employment contract and the complex and contradictory position of workers in the employment relationship. Their agency tends to resolve the fundamental contradictions inherent in the labour process. Their tendency to create use-value and their orientation towards 'the other', the person who is a colleague or a customer and with whom they interact, in our view explains much of the observed compliance and collaboration, even under conditions of commodification. This collaboration does not devalue the power of conscious agency. At the same time it reaffirms the ultimate ownership of work and knowledge, the explicit awareness of this ownership and active strategies of appropriation. While this behaviour may be rooted in the 'promise to obey orders' dimension of the employment relationship and may thus be relevant and meaningful for the organisation (Van Hootegem, 2000: 45ff) it definitely creates meaning for the worker too. Workers actively choose how to act and react in the labour process undergoing transformation even in conditions where the boundaries are set by the organisation.

At the end of this second part of the empirical analysis and with all these observations in mind, it is possible to conclude that opening up the analysis to include the strategies, agency and interaction between management and workers, in other words the dynamics of the employment relationship, did indeed contribute towards a better understanding of the design, process and outcome of spatial restructuring projects. In the employment relationship, knowledge is a key dimension of indeterminacy and despite the difficulties and limits of its articulation and observation, it is real because it is real in its consequences.

6 | Conclusions

'Offshore outsourcing is here to stay.' With these words trade union leader Gerhard Rohde officially opened a conference for an audience of trade union representatives from all over Europe in Paris in February 2005 (Ramioul & Huws, 2009b: 327). This opening sentence articulates well the interest in a number of studies carried out during the first decade of this century. These studies have primarily aimed to address the growing international division of labour as accelerated by ICTs, which have shown themselves to be ubiquitous and virtually limitless in their capacity to bridge time and space. Conspicuous works such as 'The World is Flat: a Brief History of the Twenty-first Century' (Friedman, 2005) have also exhibited the vision of a highly developed globalisation based on intensified outsourcing and offshoring, supported by advanced hardware and software and leading to global value chains in which time, space and place have all dissolved into seamless work flows. Research on changes in work related to these trends has yielded maps offering several avenues, opening the way to destinations where new knowledge was in sight. The investigation of global value chain restructuring, in which business functions are shifted contractually and geographically within and between organisations and regions, has opened a particularly promising pathway towards a better understanding of a range of changes currently taking place in work. It has delivered on that promise. New quantitative and qualitative data are now available, with new insights into important trends in work related to globalisation and a truly European Research Area on changes in work that extends far beyond the individual research projects.

In these conclusions, we review the journey on which we embarked when we discovered some fascinating side-roads and attractive spots on the road to knowledge about offshoring and outsourcing. As with all research, the map that was designed at the outset of the journey was needed in order to make a start but several traffic lights, roundabouts and road works were encountered along the way. In these conclusions we do not report on the creative improvisations necessary to complement the original research plan, which was inevitably underspecified. As is so often the case, these improvisations were decisive in determining the scientific outcome.

Our first stop on the road was when we came across the question of the relationship between the social division of labour, resulting from contractual and spatial allocations of work, and the technical division of labour, based on decisions about organisational structures. The social and technical division of labour come together in jobs but they are described in theoretical terms as generic and distinct processes. The question whether work is transformed when it is moved was a legitimate one. Since a lot of research on offshoring and outsourcing, by definition, focuses on the allocation side, we wondered what happens on the technical side. We felt that a deep understanding of what workers, affected by spatial restructuring, actually 'do' tended to be rather underexposed amidst the legitimate concerns about their contracts and wages. At least equally important was the general idea and the expectation among managers that relocating jobs is chiefly a matter of lifting and shifting, whereby attention should be focused on both duplicating technical infrastructures and production conditions and finding an adequate labour force. In our view the precise relationship and the relative priority of the technical and social division of labour remained unresolved empirical questions.

In the restructuring events that we analysed, we did not find spatial restructuring without changes in the technical division of labour. The transformation of work occurred before, after or simultaneously with its relocation. These transformations were either planned and

intentional or else additional and 'improvised', in the sense we defined it. Changes in the technical division of labour accompanying relocation could be explained by productivity and rationalisation objectives, which are traditional drivers, and also by product market strategies, labour market conditions, technical limitations, specific product characteristics or an acute or more permanent dependency on the specific expertise of workers. Whatever the reasons may be, they are sufficiently numerous to create a reasonable expectation that our conclusion on the interdependency between social and technical division of labour will not easily be refuted.

As regards the relationship between spatial restructuring and changes in the contractual governance mode (outsourcing), our explicit decision to focus our analysis on the spatial dimension under different contractual conditions could not be repudiated. No obvious differences were observed concerning the changes in organisational structures and functional coordination between in-house and outsourced relocations. The data available to us on the contractual arrangements governing outsourced relocations also showed that the situation on the ground was quite blurred. In those cases where the sites that share part of the work flow were not formally part of the same company, the complex ownership structures, power relationships, mutual dependencies and the overlap of functional and contractual coordination elements suggest that drawing conclusions based on a more elaborate analysis would not have been straightforward. Investigating the precise relationship between contractual and spatial restructuring and changes in the technical division of labour requires a specific research approach, disentangling the respective impact of each of these processes. This is consequently an avenue for further research.

This is important first of all for the workers involved. Clarity on their membership status and on who is their boss, is essential when it comes to bargaining over employment conditions, training and development opportunities and knowing who to hold accountable in case of health, safety and psychosocial risks and hazards. It is also necessary to develop a sustainable sense of belonging to colleagues and places. This sense of belonging is a dimension of wellbeing at work that should not be underestimated, although, as far as we can judge, it has hitherto perhaps been addressed too infrequently when measured against the growing number of organisations operating in complex triangular, rectangular and multi-party configurations. In such configurations, more parts of the managerial authority are gradually disconnected from the employment contract and from the place where the worker is located and this generates increasingly hybrid relationships between times, places, contracts and work. The changes in work being observed today thus seem to point towards a reinvention of the workplace and this deserves adequate research attention and awareness of the winners and losers.

Another key finding in this part of the research was that judging from the deep impact of the technical division of labour on job quality, it deserves to be examined very closely. This means looking at the task structure, the breadth and composition of tasks, the extent to which workers can prepare and plan their work, obtain support and interact with superiors and colleagues, resolve problems and disturbances and above all learn from all of these things. Explanations of these job structures are provided when analysing the coupling and decoupling of system functions on different levels, from the overall transformation process down to its subtasks. We hope that by applying the sociotechnical organisational structures approach (STOSA) to the case study data we have helped to complement and enhance the innovative approach introduced with the business function and the global value chain. These have the merit that they simultaneously include in the observation changes in work on a lower level than the entire company and beyond its physical boundaries. Business functions are key to providing a window to the broader value chains to which organisations and work-

places are connected and as such the concept is a very useful entry point for research. As a level of observation and based on its underlying assumptions we found that the business function concept does not provide sufficient detail and power to understand the real changes in work provoked by restructuring. It gives rise to a risk that the organisation in which managerial decision-making is situated is excluded from the scope, despite the fact that it is there that the division of labour and the employment relationship are shaped and transformed.

Our detailed analysis of changes in the technical division of labour made it possible to discern a clear pattern: except in one single case, spatial restructuring was accompanied by higher levels of technical division of labour at the destination sites while the opposite trend was observed at the source sites. More functional concentration, differentiation, task specialisation and fragmentation resulted in smaller jobs. Where transformation processes were divided, the outcome was thus a combination of highly contrasting organisational models at both ends of what was originally a single, integrated process. Dependency on the expertise and knowledge of workers, on intensive and complex interaction with customers and colleagues and on the related unpredictability of and interdependency between tasks were identified as major explanatory factors for this outcome. This sharp contrast in outcomes between source and destination sites should keep the complex question of the distribution of work between regions, industries, organisations, sites and, above all, workers related to globalisation and to the lengthening of value chains high on the agenda at all times.

With these answers to our first research question and the concerns raised by them, we arrived at a second spot that was found along the research journey. We wondered whether the path towards the knowledge-based society was as straight as positivists and policy-makers postulate. From their perspective, the codification of knowledge presents itself as a legitimate goal in that it may support access by developing economies to globalised markets, lower transaction costs, facilitate specialisation, support science-based industries and, as a consequence of all these benefits, foster economic growth for all. The originally undisputed views on the movement of unskilled labour to developing countries leaving only higher added value, knowledge-intensive activities behind, have since been qualified and it is now more generally accepted that the creation of new, unskilled jobs is pertinent in the old economies as well. This should now hopefully help policy-makers to seriously address concerns about the quality of these jobs and about the opportunities they offer, or not, for vulnerable groups to develop a sustainable career and life.

Based on the specific research interest of this study, the macro perspective was not the major concern. Given the outcome of the first analysis we wondered whether knowledge, and in particular the extent to which it is codified or tacit, may contribute towards explaining the design, implementation and outcome of spatial restructuring. This was our second central research question. The road to the answer was an eventful one because it required us first to make a trip towards a better understanding of the nature of knowledge. This was not just a cursory exploration. The purpose was to investigate knowledge in its practical applications and effects, looking at the point when it becomes real at the workplace. The reason for this is that it quite quickly became clear how knowledge, as inextricably embodied in humans, lies at the centre of the employment relationship, more precisely at the heart of the indeterminacy of the employment contract as its most fundamental characteristic. The exploration of the role of tacit knowledge in the labour process was expected to focus attention on the importance of the worker's input into the labour process. The case study data demonstrated that practices of contextualisation and improvisation are prevalent and, in fact, vital in determining actual performance in all types of work, although they obviously come in different gra-

dations depending on the knowledge-intensity and interaction requirements of different tasks and how these are shaped in the organisational structure.

When assessing tacit knowledge as an explanation for restructuring, however, we must conclude that the concept eventually turned out not to be as promising as we expected. True, it is fascinating to try to identify where in different types of human behaviour the boundary lies between tacit and codified knowledge: what else can we do without being aware of the rules we follow? How many and what tricks of our trades can we *not* explain and share? How is it that some people perform better than others when carrying out a similar task? The practical examples of tacit knowledge in daily private and working life are by definition endless and inspirational. The value of tacit knowledge, however, turned out to be unsatisfactory for a better understanding of spatial restructuring for two reasons. Firstly, what is codified and what is tacit is relative and bound to specific persons, times, spaces and contexts. The level of codification is very different, not only between regions, industries and companies, but also at the micro level of the workplace. What may be obvious and documented for workers, is not necessarily accessible to management, superiors or even colleagues. Codification is by definition an incomplete process and the development of new tacit knowledge is intrinsically related to human action.

Thinking through tacit knowledge thus creates a risk of generating idiosyncratic, contingent and constructivist reasoning. This makes it difficult to handle in sociological research on changes in work. Its practical manifestations in contextualisation and improvisational work practices, in contrast, proved all the more useful and these are, to a reasonable extent, observable as well. Listening attentively to how workers describe their job, the problems they encounter and how they resolve these, how they teach newcomers and try to accommodate work prescriptions to their own needs and interests while also meeting the needs of the transformation process, creates opportunities to observe knowledge utilisation. More importantly, this observation makes it possible to generate additional explanations of ways in which labour processes are produced, reproduced and transformed by the agency of workers. This is one advantage that not all managers implementing restructurings had apparently discovered.

A second problem with the limited value of tacit knowledge for our research is that codified knowledge may also be spatially bound and too sticky to relocate. Stickiness may refer to complex knowledge, when it is vast, abstract, and interpretative and requires a serious investment in education, training and experience before it can be mastered. It may be simply too costly or too speculative to make such investments in destination regions, companies or sites. Stickiness may also refer to the need to interact with others - colleagues, customer and clients - before a task can be completed. Services, in particular, tend to be location-bound although it is obviously not impossible to relocate certain types of service work. In sum, tacitness matters less than stickiness. We concluded that the implications of knowledge characteristics for relocation are contingent and expectations of what can be offshored are difficult to generalise. Not only the type of work as such, but also the way it is organised will eventually define the conditions for knowledge utilisation and consequently the extent to which knowledge facilitates or prevents the relocation of particular activities. Knowledge characteristics as such are not to be interpreted as sticky, in an 'absolute' sense, but rather their relation to specific tasks in the network of jobs generated in the organisational structure.

These insights do not make the question on the offshoreability of work any easier to answer, at least not for organisations planning to restructure their activities. Short-cycled, standardised and fragmented jobs generated by high levels of technical division of labour are of course less spatially bound and more easily shifted geographically. The more complex and

interactive, interdependent and unpredictable the tasks, the more difficult their geographical move will be. Nevertheless, these are still restructured. Such restructuring does, however, necessitate explicit awareness and investments to secure the adequate transfer of both codified and uncodified bodies of knowledge. In addition, and no less importantly, it necessitates the creation of conditions for the generation, use and circulation of new knowledge at the destination. Such conditions are optimal in organisational structures with low levels of technical division of labour. Sufficient time, resources and participation of workers are equally necessary. Thus we encountered another question here: what investments are made to transfer knowledge in spatial restructuring events?

Judging from the difficulties encountered by several of the companies of our sample during the actual implementation of spatial restructuring, such comprehensive preparations, sufficient implementation time and participation of all involved were apparently not self-evident and were particularly absent in the case of work assessed by management as not being knowledge-intensive. The analysis learned that organisations may include considerable performance losses in their budget calculations on restructuring and tend to rely on spontaneous knowledge generation at destination sites. These expected performance losses thus apparently do not prevent the companies from restructuring. In cases where the management is highly dependent on the knowledge of the workers, in contrast, efforts to codify knowledge for the purpose of transferring it are complemented by creating the conditions for the generation and sharing of tacit and contextual knowledge between dispersed workers.

This was another remarkable finding along the road: a lot can go wrong when work is restructured over a distance. The map is definitely not the territory. Several causes were identified. First, the data suggest that higher levels of the technical division of labour with greater requirements for regulation and less capacity for regulation account for the largest number of such problems. In many cases, however, the cut-off point for spatial restructuring was also more ambiguous than expected. While this cut-off point was identified for the decoupling of tasks according to their knowledge requirements, the separated ends often still turned out to be highly interdependent. Incomplete codification and transfer of knowledge were also identified as causes of mistakes and disturbances, but in the end these are dynamic realities: codification, as in the case of work prescriptions, documentation or knowledge bases, emerged as an on-going process and the same is true for the generation of new (tacit) knowledge required for contextualisation and better performance.

And so we arrived at the last path on our journey towards understanding spatial restructuring: what is the role of employee agency in the transformation of work? The decision to include the labour process perspective was intended to add a further level of explanation to the final outcome of the spatial restructuring events, by complementing the empirical interest in work with a theoretical concern about the contradictory relationships between labour and capital (Edwards, 2010: 42). The in-depth analysis of the agency of workers during and after restructuring confirms this complex and contradictory reality on the shop floor and defines this as intrinsic to the open-ended nature of the employment contract. The cases provided rich information on how individual workers reacted to major transformations of their work or in the newly established production processes resulting from these. The observed collaboration of workers tended, however, to be directed in the first place to their colleagues and customers, rather than to the overall company goals. In their agency, they did not prioritise the latter over their own, independent and conscious strategies. This observation therefore simultaneously reaffirmed the importance of use-value creation in work and, from this, the ultimate ownership of work and knowledge leading to the active appropriation of work in order to recover some autonomy. Consequently, we concluded that collaboration does not

devalue conscious agency of workers, and it is essential to include indeterminacy in research and theory on organisational change if a deep understanding is to be achieved.

At the end of our journey we found ourselves at the cross-road of several theoretical and empirical strands and perspectives: global value chain theory and research, sociotechnical system and organisational structures theory and the labour process approach. Each has demonstrated its own specific merits and values and the complementarities between them have been identified as ways of understanding the complexity of spatial restructuring.

As we reach the end, the major lesson learned from the restructuring cases points to the importance of working with the territory, and with the people present and acting on it, rather than sticking to the map. Despite the promises given by some that the world would become flatter, it has turned out to be bumpy and occasionally it is rough going too. This demands more than just a map, as 'an abstract space, devoid of any landmarks or any privileged centre' (Brown & Duguid, 1991: 2). Granting the workers whose jobs are being relocated sufficient opportunity to be involved and to participate in the restructuring in order to make it not only economically but also socially sustainable was precisely the message of the trade union leader whom we quoted at the outset of these conclusions. Workers are still the experts when it comes to making explicit - or codifying - the requirements in order to do a good job and explaining exactly how they do their work and why that is the case. They also know what will not work remotely. The question of whether they will, by definition, not collaborate in restructuring and will oppose any relocation is an empirical one, even for trade unions. From our research we have reached the conclusion that acknowledging the genuine expertise of workers and involving them in restructuring may be just as important as fair compensation and decent alternative offers of employment. A pertinent final recommendation would be that sufficient time and resources should be allowed for real participation, even in the design, preparations and practical implementation of restructuring.

appendix 1 WORKS qualitative research: guideline for organisational case studies

This is a 'master' guideline for the organisational case studies within the WORKS-project. It contains the research questions and information about who should be respondents. It is not an interview guideline (*i.e.* the wording of the questions *cannot* be used as such in an interview); rather it is a common basis for the development of more specific guidelines for case studies in the different business functions and sectors. This means that the 'master' guideline still needs to be individualised not only according to case study but also to types of respondents. It is neither necessary nor possible to ask all respondents all questions. Parts of the 'master' guideline are intended to be the basis for the development of interview guidelines for managers and workers' representatives, others are the basis for interview guidelines for workers.

The aim of the 'organisational' case studies is to analyse the impact of the restructuring of value chains on work organisation and quality of work. This means that in each case study information has to be collected on the restructuring of the value chain, on work organisation and on the quality of work, but also on how the actors and people that are affected by the changes perceive the impact of value chain restructuring on the quality of work.

For definitions of terms (*e.g.*, value chain, business function, management control, etc) please refer to the WORKS Glossary, the report on WP 3 and the report on WP 6. In case of any uncertainty please contact FORBA!

The questions in the following 5 main parts of this document are intended to help to reach this overall aim.

1. Background research and expert interviews on the case and on value chain restructuring.
2. Case study interviews on value chain restructuring – respondents are senior managers and senior workers' representatives (this means that this part is intended to be *the basis* for interview guidelines that need to be developed by all partners for their interviews with managers and workers' representatives).

3. Case study interviews on HRM, employment conditions and employment relations – respondents are senior managers and senior workers' representatives (again actual interview guidelines still need to be developed on this basis).
4. Case study interviews on work organisation, skill and time use – respondents are managers, workers' representatives and, which is very important, workers (again actual interview guidelines still need to be developed on this basis).

1. Background research and expert interviews on the case and on value chain restructuring

For the case study comprehensive information is needed on the companies involved, on the organisation of the business function, on the structure of the value chain and on recent processes of restructuring. Obviously, part of this information is already collected for the purpose of case selection. This should be complemented by additional sources available in the Internet, by annual reports and newspaper clippings. If this information is not sufficient, the desk research should be complemented with expert interviews with company managers, trade unionists or other experts (only one interview per case should be necessary for this).

On the basis of the background research and the expert interviews the researcher should be able to provide the following information in the case study report:

1. Organisational, legal and ownership structures of the business function and the value chain under investigation (companies involved, units within companies, ownership structures, etc).
2. Description of the value chain in functional terms: What are the final products or services? What are the intermediate products or services? What are the discrete functions or tasks the overall workflow consists of? What is the basic division of labour between the various links (units, establishments) within the value chain?
3. Geographical structure of companies and units, etc. involved.
4. Information on the sector and on the business function that is necessary to understand the drivers and the dynamics of restructuring (market situation; competition in the sector; development of the business function).
5. Basic information on restructuring: changes in legal, organisational, spatial and ownership structures during the last two or three years (mergers, takeovers, outsourcing, insourcing, spatial decentralisation, spatial consolidation, etc.).
6. Information on employment: How many workers are employed in the different units and companies? What is the gender composition of the workforces? What categories of workers are employed in the different units (standard or non-standard employment)? What are the levels of qualification?
7. Basic information about the terms and conditions (mainly wages and working hours) in the companies, sectors and countries involved and, in particular, the differentials between these.

The research team has to decide as to when there is enough background information. But what is enough background information? It should be comprehensive and detailed enough:

- to understand the general framework of companies, supply relations, division of labour, etc. the case study is located in;
- to take an informed decision regarding the definition of the object of study: 'What actually is the business function and the (segment of a) value chain that will be investigated? What process of restructuring will the case study focus on? What will not be covered in the case study?';

- to develop hypotheses about the relation between value chain restructuring and quality of work for this particular case;
- to take decisions on the selection of respondents for the case study;
- to be able to adapt the research questions and the case study guideline to the particular case;
- to be able to focus in the interviews on the core questions and not having to spend time to collect general information.

2. Case study interviews on value chain restructuring

This is the first part of the actual case study interviews. Respondents for this part are **senior managers *and(!)* senior workers' representatives or trade unionists.**

The aim of this part is to describe the structure of the value chain, to describe the process and the outcome of restructuring, to describe the governance of the value chain; and to describe the drivers of value chain restructuring.

To reach this aim the researcher is asked to give the following information in the case study report:

1. *Description of the business function and the value chain.* (Information is needed on the different units and their functions (What is done where? What is the exact function of each unit?), on the spatial structures).
2. *Information o the governance of, and power relations within, the value chain.* (Information on the contractual relations between companies, on bureaucratic control or quasi-market relations within company boundaries, on the symmetry or asymmetry of power between organisations and units. It is of particular importance to analyse in detail the business relationships: 'What contracts regulate the cooperation between companies? What conditions for service delivery do the contracts stipulate? How is quality assurance organised? Under what conditions can the companies terminate a contract? Regarding power relations the questions could include: What kind of (mutual) dependence exists? What are their main power resources of the various entities (market dominance, specialised knowledge, network relations, etc.)?) How much collaboration is involved (for example, collaborative R&D)?'.
3. *Description of temporal aspects.* What is the role of time in market competition? Does speed and flexibility play a role in the relations between units and companies in the value chain?
4. *Description of the restructuring process, the main changes and the main actors.* (It might be helpful to ask the respondents for a description in chronological order: 'What was the status-quo-ante? What were the main events? Who were/are the main actors (headquarters, local management, entrepreneurs, consultants, other intermediaries, governments, trade unions, etc.)? How where decisions taken? What has changed? What is the current state of affairs?').
5. *Information on the locational advantages and disadvantages of the regions or cities involved.* (What were the main determinants of decisions where to locate a business (availability of labour, access to knowledge, labour costs, other costs, access to market, subsidies, etc.?)
6. *Information on employment.* (What have been the changes in the numbers employed in the different units along the value chain? Have there been changes in the employment contracts? Have there been any changes in the level and the form of pay in the different units?).

7. *Information on the role of employment regulation on the restructuring of the value chain* (*e.g.* the extent to which differences in working hours regulations or practices have influenced decisions on restructuring?).

3. Case study interviews on HRM, employment conditions and employment relations

Interviews should be conducted with HR-managers, line managers and workers' representatives (formal or informal) and trade unionists. It is not necessary to interview workers about these issues but it is absolutely necessary to interview both managers and workers' representatives.

The aim of this part is to collect information about the impact of restructuring on employment and on employment relations.

Information needs to be collected at least on two connected units within the value chain (*e.g.*, in the case of outsourcing, on the internal IT department *and* the external IT service provider or on the internal customer relationship unit *and* the external call centre company).

The following questions cannot be asked in this wording but need to be adapted to the case study situation and to the type of respondent (manager or workers' representative).

Employment and representation:

1. How many workers are employed in the different units? How have the numbers changed in recent years?
2. What categories of workers are there in the establishments/units? Under what contractual arrangements do workers work? What forms of contractual flexibility are used (agency work, freelance, fixed-term contracts, contract work)? How and for what activities? What differences are there between the different units along the value chain?
3. What are the basic gender relations within the organisations? How does the segregation between groups of workers reflect the gender division of labour (*e.g.* gendered tasks, functions, positions, etc.)? What is considered 'normal' gender relations in the organisations studied? Is asymmetry of power made visible and discussed as a problem?
4. Are there formal workers' representation bodies? Who is represented by them? Are unions present at the workplace? Is there a European Works Council? How are flexible workers represented? Do representation and negotiation also cover workers in closely linked units of the value chain (*e.g.* not belonging to the same company)? Are workers covered that work within an establishment but have a different employer (a work agency, IT service provider, etc.)?
5. What issues are negotiated between management and workers' representatives (*e.g.* pay, working hours, work-life balance, etc.)? How can the agenda of negotiation be understood from a gender perspective? Is the tradition of the ideal worker, being a man with no responsibility for family care work, reflected in the agenda of negotiation?
6. How is pay regulated in the different companies, units and for different occupational groups? How are working hours regulated? How are issues of flexibility dealt with? Is the work-life balance an issue? Who are the actors dealing with health and safety issues? Is bargaining organised within the establishment or the company or the sector?

Consequences of restructuring:

1. Did restructuring include a transfer of workers between companies and employers? What were the impacts of transfers on employment conditions?

2. How does Human Resource Management respond to value chain restructuring? How does HR respond to strategies of the companies/units in relation to their position within the value chain (competition, upgrading)? What changes were there regarding the access to training and knowledge acquisition more widely?
3. Have internal labour markets become undermined through the establishment of market relations? Or has restructuring led to the strengthening of new internal labour markets? (employment security, promotion prospects, seniority, etc.)
4. How has restructuring changed workers' representation and workers' voice? What is the interrelation between restructuring of value chains (or the threat of outsourcing and relocation) and workers' bargaining position ('concession bargaining', 'coercive comparison', etc.)?

Impact of restructuring on regulation:

1. What are the basic principles of labour regulation in terms of employment protection, wages, working hours and training in different companies, sectors, countries? How do these include or relate to legal/organisational policies on gender equality? What are the differences along the value chain regarding the level of labour regulation (regarding pay, working hours, employment protection, representation, access to training)?
2. To what extent are differences in the labour regulation and in the level of employment conditions (wages, hours, employment protection, representation) drivers of outsourcing, relocation and other forms of restructuring of value chains? What changes in terms and conditions of workers in different units along the value chain are caused by restructuring?
3. To what extent does national/European regulation shape the involvement in and negotiation of consequences of restructuring (*e.g.* transfer of undertakings directive – Council Directive 2001/23/EC).
4. Does concession bargaining put pressure on national regulation? To what extent is existing regulation undercut in particular cases? Are there strategies of renewal in labour regulations and industrial relations with a view to better cope with restructuring and its consequences?

4. Case study interviews on work organisation, skill and time use

Interviews should be carried out with workers typical of the business function who actually carry out the tasks (clothes designers, researchers, production workers, dispatchers, truck drivers, software developers, call centre agents, etc.) and with line managers. Information obtained from senior managers and workers' representatives may help but as such is not reliable enough. As a rule, it is necessary to collect the information *in more than one unit* (establishment, company, etc.), *i.e.* your 'point of entry'-unit and another one closely related in the restructuring (*e.g.*, in the case of outsourcing, the internal IT department *and* the external IT service provider or the internal customer relationship unit *and* the external call centre company, etc.).

The aim of this part is to collect information on work organisation, skill and training and working hours. The main focus is to assess the impact of value chain restructuring in these areas.

The following questions *cannot* be asked in this wording but need to be adapted to the case study situation and to the type of respondent (manager or worker). This means in particular

that each partner has to develop a separate interview guideline for workers for each case study.

Work organisation:

1. What are the tasks carried out in the unit (establishment, department, etc.)? What are the relations with other units in terms of division of labour, co-operation and control?
2. What was the impact of recent value chain restructuring on the functions performed and tasks carried out in the unit in quantitative and qualitative terms?
3. What are the basic organisational principles (task orientation or process orientation)? How is the workflow organized?
4. What is the division of labour in core areas? What is the horizontal division of labour (broad work roles or fragmentation)? What is the vertical division of labour (levels of hierarchy, separation of conception and execution)? Are there new organisational roles?
5. What forms of co-operation exist? Is there teamworking and, if so, in what form? How has co-operation changed? What is the role of ICT?
6. What are the main forms of managerial control (job descriptions, direct control *versus* relative autonomy, role of economic targets, forms of supervision and performance monitoring, etc.)? What is the role of customers (customer companies) and of contractual relations with other companies in the control of work?
7. What are the main forms of functional flexibility? Are workers deployed flexibly in different tasks, teams or departments? Are workers deployed flexibly across company boundaries?
8. What is the role of ICT for carrying out the work, for organising the workflow, for management control?
9. How has workload developed in recent years? What are the main factors for the level of individual workload? How has value-chain restructuring affected the workload? How do the relations within the value chain and, in particular, the contractual relations shape the autonomy at work and the intensity of work?
10. Is there geographically distributed work within the business function and the units under investigation? What form does geographically distributed work take? What are the consequences for the quality of work?
11. What is the importance of distance in work processes? What are the demands on the workers‘ geographical mobility? What are the consequences for the work-life-balance?

Skills and knowledge:

1. What are the formal skill structures in the various units under investigation? What formal qualifications are required for the different jobs?
2. How do the formal skill structures relate to the gender division of labour? What are the differences between men and women regarding formal qualifications?
3. What are the actual skills needed for carrying out the tasks? What is the knowledge intensity of the different tasks?
4. What are the principles and opportunities for skill acquisition and skill development (learning)?
5. How have basic skill structures changed because of restructuring? Have the required formal qualifications changed?
6. Has the degree of standardisation and formalisation of tasks changed? Has there been an explicit attempt to codify knowledge and to standardise tasks in the process of restructuring? What is the role of IT databases in knowledge management?

7. What consequences did restructuring have in terms of skill needs and recognition (status) for the main groups of workers? How have the chances of applying one's implicit, experience-based knowledge changed?
8. Have the opportunities for skill acquisition and skill development (learning) changed due to restructuring?

Time:

1. What is the temporality of the functions performed and of the workflows (importance of time-to-market; just-in-time systems; simultaneous engineering, 24-hours-service, etc.)?
2. How is working time organised? To what extent are workers autonomous in their time use? To what extent has the temporality of the workflow, etc. changed?
3. How do relations within the value chain and contractual arrangements between companies impact on time structures and working hours? Are demands for flexibility passed on between units/companies in the value chain?
4. What are the differences between the units along the value chain regarding the actual hours worked? To what extent does (national) regulation shape working hours? How and to what extent is the regulation actually enforced?
5. How have working hours and time use been affected by value chain restructuring? What is the impact of restructuring on the enforcement of working hours regulation? What are the consequences for the perceived quality of work and quality of life?

5. Other main topics regarding restructuring and quality of work

In the interview guidelines we should leave room for issues other then employment conditions, work organisation, skill and time use that, in the particular case, might be as important or even more important for the quality of work. Respondents should be encouraged to describe other effects of value chain restructuring that influence employment and working conditions. In the case study report the researcher should thus answer also the following questions:

1. How do workers in general assess the quality of work and possible changes through restructuring?
2. What other important impacts has value chain restructuring had on the quality of work? What major issues emerged in the case study, which are not covered by the previous sections?

appendix 2 WORKS organisational case studies: reporting

Each case study should be summarised in a short report of approx. 15 pages length (using the WORKS template). The 58 presentations (case studies) will be the basis for writing the synthesis report. The interpretation and synthesis of the certainly very rich material will only be possible if the individual cases are presented in a standardised way and comprehensive information is given under each heading. At this stage we suggest a structure for the description of the case studies which is based on the case study guideline. Each section should contain concise information on the topic and should be as self-contained as possible (for the purpose of putting together the information on a particular topic from all case studies).

Please give some (short) verbatim quotations from the interviews to convey the 'flavour' of the case and to illustrate the respondents' views on important points of the case study.

Case study report structure

GENERAL INFORMATION

I. SHORT INFORMATION ON HOW THE CASE STUDY WAS CONDUCTED

Including: Organisations / companies covered by the research, number of interviews, number of male/female respondents, position of respondents, number of visits, etc.

II. GENERAL OVERVIEW OF THE CASE STUDY

Brief basic characteristics of

- the companies involved: _____
- the business function: _____
- the units covered: _____
- products and services: _____
- the restructuring: _____
- the period of restructuring (when): _____
- numbers of workers in the companies: _____
- geographic spread of value chain (countries, regions: _____

III. CASE STUDY FINDINGS

Please present, under the following headings, not only the current state of affairs but also the restructuring process (or changes caused by the restructuring process). This means that the starting point, the process, the outcomes and the actors of restructuring should be described. Please make clear in which categories there was change and in which continuity.

It is recommended to use not only the headings but also the subheadings in the case study report.

1. Company and value chain (re-)organisation

1.1 (re)organisation of the business function, legal and ownership structures, company boundaries
1.2 (re)organisational and spatial aspects of the value chain
1.3 contractual relations (between the companies) and power relation (main power resources of companies and units, forms of governance of the value chain)

2. Functions and overall workflow in the value chain

2.1 functions performed in the value chain, changes through restructuring, tasks carried out in different units, division of labour, workflow in core areas
2.2 geographical structure of companies and units, spatial division of labour along the value chain, geographically distributed work
2.3 temporal aspect of the workflow, the role of time and flexibility, consequences of restructuring

3. Changes of employment

3.1 employment structures (categories of workers, basic gender relations, employment contracts) including changes
3.2 employment conditions (terms and conditions, contractual flexibility), human Resource Management and internal labour market (including changes)
3.3 negotiations on changes in employment (redundancies, transfer of workers, etc.) and employment conditions
3.4 impact on quality of work

4. Changes of work organisation

4.1 content of work, cooperation, managerial control, spatial aspects (distributed work, workers‘ mobility), role of customers (including changes)
4.2 organisation of working hours, differentials in working hours between companies, temporal flexibility (including changes)
4.3 functional flexibility, teamworking (including changes)
4.4 impact on quality of work

5. Skills, knowledge and learning

5.1 formal skill structures (including differences between men and women) and actual skill needs
5.2 knowledge intensity of the different tasks, standardisation and formalisation of work

5.3 learning opportunities, training policies
5.4 impact on quality of work

6. Industrial relations & regulations

6.1 forms of workers' representation
6.2 information and consultation, issues of negotiations
6.3 impact of national and European regulation (on the involvement and negotiation of consequences of restructuring,) and problems of enforcement
6.4 pressures on regulations and national institutions

7. Conclusions

7.1 basic characteristics of the case
7.2 significance of the case for various WORKS research questions
7.3 impact of restructuring on quality of work and quality of life

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Summary

Organisations restructure their activities and they relocate work to other subsidiaries and firms. The first research question of this study was whether work is transformed when it is moved: do companies simply duplicate the processes at the destination or are the activities restructured along the way? In the restructuring events analysed, the work changed profoundly and generated a sharp contrast in outcomes at both ends of what was originally a single, integrated labour process. At the destination sites, tasks tended to be more divided and fragmented while at the source sites the remaining work was usually integrated into more interesting jobs. The analysis also demonstrated that the separated activities often remained highly interdependent, leading to complex processes that were more sensitive to disturbances. This increased the need for various forms of functional coordination.

Judging from their deep impact on job quality, these outcomes deserve to be examined closely if we are to really understand the consequences of relocations for work. An in-depth analysis of what workers, affected by spatial restructuring, actually 'do' tends, however, to be rather underexposed amidst the legitimate concerns about their contracts and wages. In order to achieve a better understanding of spatial restructuring from the perspective of changes in the technical division of labour and taking account of the social relations at work, the study applied the sociotechnical system and organisational structures theory and combined this with the labour process approach. The analysis of a number of restructuring events confirmed that this leads to a more adequate model to observe and explain spatial restructuring as compared to the business function concept used in global value chain analysis. The theoretical model is powerful to conduct comparative analysis and it enables to include both in-house and outsourced relocations in the observation and analysis. In this respect, another finding was that combinations of contractual and spatial restructurings may lead to workplaces where organisational membership, work and place are increasingly disconnected. There is, in other words, a growing separation of the two constituent dimensions of the employment relationship: the employment contract and the employment regulation.

A second endeavour of the study was to understand whether knowledge may contribute towards explaining the design, implementation and outcome of the relocation of work. In addition, the aim was to analyse the strategies and agency of management and workers on the use of knowledge in the context of restructuring. It was concluded that the expectations of what activities can be relocated are difficult to generalise. Not only the type of work as such, but also the way it is organised will eventually define the conditions for spatial restructuring. The more complex and interactive, interdependent and unpredictable the tasks, the more difficult their geographical move will be. Nevertheless, such activities are relocated too. It does, however, necessitate efforts to secure the adequate transfer of knowledge and the creation of conditions for the generation, use and circulation of new knowledge at the destination. Such efforts were particularly absent in the case of work assessed by management as not being knowledge-intensive. As a result, especially uncodified knowledge was at risk of being lost in the process of restructuring.

In this part of the study, it came to the fore that the assessment, strategies and agency of management and workers concerning the use of knowledge in the labour process are highly ambiguous. From the labour process approach perspective, knowledge should be acknowledged as a central dimension in labour process dynamics and in the employment relation-

ship. While the codification of knowledge is a core managerial strategy, especially in restructuring, knowledge is also a key to the indeterminacy of the employment contract and to worker's agency. In order to understand knowledge utilisation, it should, however, be investigated in its practical applications and effects. Contextualisation and improvisation are adequate concepts to observe and analyse in particular uncodified knowledge applied by workers. Here, the study demonstrated that both practices are prevalent and, in fact, vital in determining actual performance in all types of work, although they obviously come in different gradations depending on the knowledge-intensity and interaction requirements of tasks. With this role of worker's agency for adequate processes in mind, acknowledging the genuine expertise of workers and involving them in restructuring is a condition to make restructuring not only economically but also socially sustainable.

By combining these different theoretical perspectives and based on a range of in-depth restructuring case studies, the study contributes to understanding why 'the map' is not 'the territory' in spatial restructuring.

Samenvatting

Organisaties herstructureren hun activiteiten en daarbij verplaatsen ze werk naar andere filialen en organisaties. De eerste vraag van deze studie was: wat gebeurt er met het werk zelf wanneer het wordt verplaatst? Repliceren bedrijven de processen gewoon op de nieuwe bestemming of veranderen de taken onderweg? Uit de analyse van een reeks herstructureringen blijkt dat de activiteiten vaak grondig worden veranderd bij de verplaatsing. Daarbij ontstaat er een groot contrast tussen taken die oorspronkelijk tot één, geïntegreerd arbeidsproces behoorden. De taken die worden verplaatst worden verder gedeeld en gefragmenteerd, terwijl het werk dat achterblijft eerder wordt geïntegreerd. De analyse toont ook dat de activiteiten die op afstand zijn georganiseerd vaak nog onderling afhankelijk blijven, wat leidt tot complexe processen en een grotere storingsgevoeligheid. Daardoor is er nood aan bijkomende functionele coördinatie.

Afgaande op de grote impact op de kwaliteit van de jobs van deze veranderingen is het aangewezen deze grondig te analyseren wanneer men de gevolgen van delokaliseringen ten gronde wil begrijpen. Een beter inzicht verwerven in wat werknemers in feite 'doen' wordt vaak vergeten bij de aandacht voor veranderingen in de arbeidsvoorwaarden ten gevolge van herstructureringen. Om de veranderingen in de structuur van de arbeidsdeling te onderzoeken en daarbij ook de sociale relaties in de analyse te betrekken is in de studie de moderne sociotechniek gecombineerd met de arbeidsprocesbenadering. De analyse toont dat dit theoretisch kader beter geschikt is om verplaatsing van werk te observeren en te verklaren dan het concept van 'de bedrijfsfunctie' dat wordt gebruikt in onderzoek van meerwaardeketens. Het theoretisch model maakt comparatieve analyse mogelijk en laat bovendien toe om zowel intra-organisationele verplaatsing als uitbesteding in de analyse te vatten. In dit verband blijkt dat combinaties van contractuele en ruimtelijke herstructurering van werk kunnen leiden tot arbeidsplaatsen waar organisatielidmaatschap, werk en plaats in toenemende mate zijn ontkoppeld. Anders gezegd, er is een groeiende scheiding tussen arbeidscontract en arbeidsregulering, de twee dimensies van de werkgelegenheidsverhouding.

Een tweede thema van de studie was de vraag in welke mate de kennis nodig voor bepaalde activiteiten het ontwerp, de implementatie en de uitkomst van hun verplaatsing helpt verklaren. Gerelateerd hieraan was de vraag welke strategieën management en werknemers ontwikkelen en toepassen inzake het gebruik van kennis in het arbeidsproces in de context van de herstructurering. De analyse toont dat het moeilijk is om verwachtingen over welke activiteiten kunnen worden verplaatst te veralgemenen. Niet alleen het type werk maar ook de manier waarop het werk is georganiseerd bepalen samen de voorwaarden voor verplaatsing. Hoe complexer, interactiever, onderling afhankelijker en onvoorspelbaarder taken zijn, hoe moeilijker ze kunnen worden verplaatst. Toch wordt ook dergelijk werk op afstand georganiseerd maar hier dringen zich dan omvattende en proactieve inspanningen op om een adequate transfer van kennis te realiseren én om op de nieuwe bestemming de voorwaarden te creëren die het genereren, toepassen en delen van nieuwe kennis mogelijk maken. Dergelijke inspanningen ontbreken doorgaans bij taken die worden beschouwd als niet kennis-intensief. Daardoor vergroot het risico dat bij herstructureringen met name ongecodifeerde kennis van de werkvloer verloren gaat.

Uit de studie kwam naar voor dat wanneer de visies, strategieën en het handelen van het management en de werknemers inzake het gebruik van kennis in het arbeidsproces worden

geconfronteerd, kennis een erg ambigue kwestie is. Vanuit het perspectief van de arbeidsprocesbenadering is kennis een essentiële dimensie in de dynamiek van het arbeidsproces en in de werkgelegenheidsverhouding. De codificatie van kennis is een centrale managementsstrategie, in het bijzonder bij herstructureringen. Daartegenover staat dat de manier waarop werknemers hun kennis toepassen in het arbeidsproces een even essentieel element is van het per definitie on(der)gespecifieerde arbeidscontract en van werknemershandelen. Om dit gebruik van kennis te begrijpen, moeten we kijken naar de praktische toepassingen en effecten ervan. Contextualisering en improvisatie zijn adequate concepten om de toepassing van in het bijzonder ongecodifeerde kennis in het arbeidsproces te observeren en te analyseren. Beide mechanismen komen voor in elk type werk en zijn noodzakelijk voor de feitelijke performantie van elk arbeidsproces, al zijn er natuurlijk verschillen naargelang van de kennisintensiteit en de interactievereisten van taken. Wanneer het belang van werknemershandelen en -kennis voor een adequaat arbeidsproces wordt erkend, is een daadwerkelijke participatie in de vormgeving van herstructureringen een voorwaarde om herstructureringen niet alleen economisch maar ook sociaal duurzaam te maken.

Door de verschillende theoretische perspectieven zoals geschetst te combineren en toe te passen voor de observatie en analyse van een reeks herstructureringen draagt de studie ertoe bij dat we beter kunnen begrijpen waarom 'kaart' en 'terrein' verschillen bij het verplaatsen van werk.

Résumé

Les organisations se restructurent et déplacent à cette occasion les activités vers d'autres filiales et d'organisations. A cet effet, la première question traitée dans cette recherche pourrait se formuler ainsi: qu'advient-il du travail même lorsqu'il est déplacé? Les entreprises reproduisent-elles les mêmes processus dans les nouvelles entités ou changent-elles les tâches en cours de route? Notre analyse des restructurations démontre que les activités sont profondément transformées lors de ces transferts. Le contraste entre les tâches composantes le processus intégré à l'origine est important. Les tâches transférées sont plus divisées et fragmentées, tandis que le travail restant devient souvent plus intégré. L'analyse démontre que les activités organisées à distance restent souvent dépendantes, ce qui engendre des processus complexes et une grande sensibilité aux perturbations. Une coordination fonctionnelle supplémentaire devient ainsi nécessaire.

Afin de mieux saisir et de comprendre l'impact de ces changements sur la qualité des emplois et la division sociale du travail, il est nécessaire de prendre aussi en compte la division technique du travail. Ce que les travailleurs 'font effectivement' est fréquemment oublié dans l'analyse des conditions de travail lors de restructurations. Afin d'étudier les changements dans la structure technique de la division du travail et des relations sociales, nous avons combiné l'approche de la sociotechnique moderne avec celle du processus de travail (*labour process approach*). L'analyse de plusieurs restructurations montre que ce cadre théorique est mieux adapté pour observer et comprendre le déplacement du travail, que celui de 'l' unité fonctionnelle' (*business function concept*) utilisé dans les études sur les chaines de valeurs ajoutés. Ce modèle théorique rend l'analyse comparative possible et permet en plus de saisir tout aussi bien le déplacement intra-organisationnel que la sous-traitance. Les combinaisons de restructurations spatiales et contractuelles du travail peuvent mener à des postes de travail où l'appartenance organisationnelle (*organisationnal membership*), le travail et le lieu, sont de plus en plus déconnectés. La séparation entre le contrat de travail et la régulation du travail – les deux dimensions du rapport salarial – est croissante.

La seconde question de cette étude abordait la question l'importance de la connaissance nécessaire pour certaines activités, pour comprendre le projet, la mise en œuvre et les résultats du déplacement d'activités. Quelles sont les stratégies que le management et les travailleurs utilisent par rapport à la connaissance du processus du travail dans un contexte de restructuration? L'analyse révèle qu'il est difficile de généraliser les attentes quant aux activités qui pourraient être déplacées. Les conditions pour le déplacement sont déterminées tout autant par le type de travail que par la façon dont le travail est organisé. Les tâches complexes, interactives, interdépendantes et difficilement prévisibles sont bien sûr plus difficile à déplacer. Néanmoins si de telles tâches sont organisées à distance, d'importants efforts proactifs devront être mis en œuvre pour transférer adéquatement les connaissances et créer, dans la nouvelle destination, les conditions pour que de nouvelles savoirs faire puissent se créer, s'appliquer et circuler. Ces efforts manquent en général pour des tâches considérées comme nécessitant peu de qualifications. Le risque de perdre les connaissances et les savoirs faire, en particulier non-codifiés, lors de restructurations, n'en n'est que d'autant plus grand. L'étude révèle de plus, que l'usage de la connaissance dans le processus du travail est une question fort ambigüe quand on l'aborde au travers des visions, stratégies et comportements du management et des travailleurs.

Pour l'approche processus de travail (*labour process approach*), la connaissance est une dimension essentielle dans la dynamique du processus du travail et dans le rapport salarial. La codification de la connaissance est une stratégie essentielle du management surtout lors de restructurations. Mais la façon dont les travailleurs appliquent leurs savoirs faire dans le processus du travail, est un élément aussi essentiel dans le contrat de travail indéterminé. Pour comprendre l'usage de ces savoirs faire, nous devons observer les applications pratiques et leurs effets. La contextualisation et l'improvisation sont des concepts adéquats pour observer et analyser l'application des savoirs faire des travailleurs. L'étude démontre que ces deux pratiques existent et sont nécessaires pour la performance de tout processus de travail, qui diffère toutefois selon que la tâche demande plus ou moins de connaissances et d'interactivité.

Quand l'importance des activités et des savoirs faire des travailleurs sont reconnues pour un processus de travail adéquat, la participation effective dans la construction des restructurations est une des conditions pour que la restructuration ne soit pas seulement économiquement mais aussi socialement durable.

En combinant ces différentes perspectives théoriques et en les utilisant pour l'observation et l'analyse de restructurations, cette étude contribue à mieux comprendre pourquoi dans la restructuration spatiale du travail, la 'carte' et le 'terrain' ne coïncident pas.

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