
by

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THE B.S.W.-METHODOLOGY:
AN INTEGRATED APPROACH TO
CAPACITY PLANNING,
PERFORMANCE MANAGEMENT and
I.T.-COST MANAGEMENT IN BANKING

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Abstract

This paper will present the basic principles of the B.S.W.-approach to I.T.- Cost Management. This method is based on a characterisation of an organisation in terms of Business activities, Information Service activities and Work activities. The method is illustrated with concrete cases from Banking environments, based on experiences in Belgium. The B.S.W.-method enables a more rational I.T.-cost management, and a better evaluation of I.T. cost/benefit performance. The impact of the use of B.S.W. is further explored by means of two case studies, where it is shown how the introduction of the B.S.W.-method influences the cost structures at the operational level.

Keywords

Introduction

The motivation of I.T.-investments is based on linking these investments to concrete changes in business processes. Radical effects are sometimes achieved today by means of business process re-engineering, whereby processes are completely re-infrastructured by means of information technology. However, in the majority of processes today, efficiency and effectiveness effects are obtained.

Value linkage and value acceleration techniques [PARKER 88] can be used at the level of individual as well as global processes. These techniques try to correlate I.T.-investment parameters to quantitative changes in business results. Being a global approach, these statistical results are far from easy to interpret.

This paper presents an alternative approach, which is based on an explicit administration of the business applications and the way how they invoke information services. Information service activities are the shells around the hardware and operating systems that enable the execution of business applications. Typical examples are Database Management Systems, Graphical User Interface (G.U.I.)-based Presentation Shells, Transaction Processing Environments, and so on. From a business perspective, it is sufficient to characterise the business activities in terms of the service activities which they use.

The internal optimisation of the service activities in terms of the hardware components which they invoke, is considered as an internal I.T.-processing procedure. This facilitates the interaction of the business users with the I.T.-services and avoids unnecessary discussions on the technical I.T.-infrastructure. Earlier experiments, e.g. with Software Physics [KOLENCE 85] clearly demonstrated that it is in general impossible to correlate business quantities to computer technical quantities, such as CPU-seconds. Correlating business activities to a higher level concept, based on transactions, jobs, and so on, seems to provide more manageable results. Moreover, contemporary definitions of computer capacity are based on throughput and response times of jobs and transactions, instead of M.I.P.S. (Millions of Instructions Per Second) [KLEINROCK 92, DENNING 80].

The B.S.W.-method is increasingly used by banking institutions in the Benelux. Users of the methodology report an improved interaction between the business process responsible and the I.T.-responsible. Moreover, the introduction of the B.S.W.-approach enables to set up I.T.-performance indices, which are used to monitor the I.T.-price/performance. Recently, the approach has theoretically been extended by means of Activity Based Costing [OVERWEG 93].

The B.S.W.-method: basic definitions

The B.S.W.-method (Business-Service-Work-method) considers three levels of activities in an organisation that involves Information Processing in its business. Business activities are the revenue generating business processes. They are typically determined by means of a Business Systems Planning (B.S.P.) architecture study or other strategic planning techniques. The performance of business activities is quantified by means of business units, sometimes also called revenue generating units or business products. Business activities are
defined and quantified by business professionals. In the banking sector, typical business activities are

**Funds Transfer related activities**

- Bond transfer
- Stock transfer
- Loan management
- Deposit/Withdrawal checking
- Foreign exchange

**Finance related activities**

- Budget planning & Control
- Asset management
- Liability management
- Capital management
- Financial reporting

**Customer related activities**

- Customer prospective investigation
- Customer Account control
- Customer Account maintenance

and so on...

Services activities are the basic system software services of operating systems. Typical examples of Service activities are on-line time-sharing services, database services, artificial intelligence inference services, network message services, and so on. Business applications are implemented by means of service processes.

**Examples:**

* A customer account control business activity may use an overnight batch processing service to perform its activity.

* A customer prospective investigation activity is typically based on the combination of online-database services in combination with artificial intelligence services.

The activity at the service level is measured in terms of service units. Service units represent consistent units of work, as they are requested from running business applications. Examples of service units are:

- Database queries,
- Online transactions,
- Batch jobs.

Production plans can be used to quantify the service demand of business activities. The marginal demand quantifies the average number of service units per business unit, for all
service activities. The marginal demand of a business activity is referred to as the "business profile" of that activity. Business activities may change their business profiles by relying on other service activities to process their business units. A typical example might be a change from batch processing to online processing. In the scheme described so far, the business professionals interact with the information processing only through the bargaining for service units. The boundary conditions for this bargaining process are determined in so-called service level agreements. In such an agreement, business throughput and response time requirements are matched with the capacity of a service activity, which is also quantified in terms of throughput and response time of transactions, jobs, and so on.

The internal management of the service activities is the responsibility of the information processing responsibilities. The basic laws of computer performance imply that service activities can be classified as consistent workload demand on the computer resources, which are called work activities. Again, production plans can be used to quantify the work unit demand of every service activity. The marginal demand is the service profile, or workload profile, of a service activity. Basically, the number of service units requested does not influence the typical profile of a service unit. However, the required service level, and in particular the response time, may vary the amount of work power that is needed to deliver the requested service. As a consequence, the internal optimisation of the service activities in terms of the work activities is an pure information processing internal management issue, once well defined service activities and service level agreements are in place. The following scheme shows the complete set of activities in the B.S.W.-approach:

The superposition of production plans, starting from a business plan - a forecast of the required number of business units - results in the planned work unit demand. This is nothing but the I.T. capacity plan, at the level of the computer resources. The intermediate forecast of the throughput of service units is nothing but a checkpoint on the boundary conditions, set by the service level agreements.

Once the required capacity is determined, average pricing can be invoked for I.T.-accounting. By means of a combination of the forecasts and the profiles, this may result in base accounting rates at each level of activity in the B.S.W.-scheme, as explained in [AVISON a.o., 1993]. For the business professionals it is most important to know the service base rates, such as the average price per database transaction, for instance. By
inverting the business profiles, the average information processing cost per business unit is determined.

Both figures are most interesting for business as well as information processing managers to position themselves in a competitive world of service offerings. The change rates for I.T. processing costs at the business level are important management indicators. The following scheme summarises the I.T.-control and feedback mechanisms that are present in the B.S.W.-leveling approach.

Benefits of the introduction of the B.S.W.-approach

Several effects of the introduction of the B.S.W.-method are reported by the installations that introduced it in their organisation. The first benefit is the explicit business orientation of the approach. The proposed scheme allows to represent I.T.-processing costs at a level where they are economically comparable with the benefits that are obtained from information processing. The business professionals are removed from the technicalities of information technology management and negotiate with information reponsibles in terms of service volumes and service levels. As a result, an improved communication on the effective needs of the business activities in terms of the kind of information service they
required, is obtained. The I.T. capacity planning process becomes more transparent to the users. The resulting I.T.-cost accounting that is integrated with that planning is consistent, accurate, repeatable and fair. Moreover the information generated by the charge-back reports is directly usable for the I.T.-budgetting of the business activities of the users.

Objective management indicators are obtained from this approach, by setting up information indices on each level of activity. The well-known mechanisms of consumer price indices can be invoked to trace and manage the price evolution of information services, information processing costs of business activities, hardware price/performance, and so on.

It is interesting to see how the B.S.W.-method changes the I.T.-control within an organisation. Traditionally, management involvement in I.T.-processing required a substantial technical skills basis, because both external and internal management of the I.T.-activities needs to be modelled and controlled. This leads often to a dilemma as the Enterprise management does not want to get involved in technicalities, for obvious reasons. On the other hand, technical I.T.-people tend to ignore that the real value of I.T. lies in the use of I.T., in other words, in the business applications. The level of the service activities helps in resolving this communication conflict. The information responsibilities are represented in B.S.W.-leveling as a set of activities that "produces" planned volumes of service units within commonly agreed service levels. The business activities use these service units as documented in the business profiles. In such an environment I.T.-activities gain a maximal degree of external auditability. User experiences report that this approach reduces substantially the communication frustrations between enterprise management and the I.T.-Responsibles.

Last but not least the service activities create an objective platform for discussing potential outsourcing of some of the I.T.-activities. It is clear that outsourcing of the application environments is impossible in a business with high dependency on information systems. Moreover, outsourcing can only be applied to the running of production systems. The high degree of infusion of information in banking products and processes will not facilitate an outsourcing of application development. Nevertheless, the development of generic business models for business operations, such as the Financial Application Architecture for Retail Banking, receives increasing interest. The B.S.W.-approach addresses in the first place production information systems. With a clear definition of the service activities and the required service levels, outsourcing or inter-organisational grouping of the service activities can be considered. Business professionals gain insight in the economies of scale that are feasible. Moreover, they receive instruments to position their I.T.-performance in a competitive market situation. The average information cost per business product increasingly becomes an instrument for the evaluation of the efficiency and effectiveness of information processing.

B.S.W.-approach in Banking: a first case study.

The following simplified example, based on a Belgian Banking Institute, can help to illustrate the usage of the B.S.W.-concepts. The installation is using an IBM-based Mainframe environment and is running most of its applications against a mainframe-based Hierarchical Database Management System, IMS/Fast Path. Most of the branches use
micro-computers and bank terminals connected to the central Mainframe, using BTN and SNA-networking. The following graphs illustrate the evolution of the production systems total budget, cpu budget, software budget and personnel budget. The B.S.W.-approach was introduced in the period 1985-1988, and stabilised from 1990 onwards. As a result, the CPU-costs have been dramatically stabilised, even with a progressive growth of CPU power. On the other hand, the software budget seems to be the main contributor to the evolution of the total budget. It is also nice to observe the NOLAN-curve shape of the total budget evolution.
B.S.W.-approach in Banking: a second case study.

A preliminary enquiry in 1992 examined the operation personnel costs. The results can be classified into Belgian Financial institutes which use or don't use the B.S.W.-approach, and Industrial organisations, which tend to adopt slower to the B.S.W.-approach, mainly due to the lack of stabilised information production workload volumes. The following tables present some of the enquiry results.

Average number of console operators

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<tr>
<td>B.S.W.-based banking</td>
<td>9</td>
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<tr>
<td>institutes</td>
<td></td>
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<tr>
<td>Non-B.S.W.-based</td>
<td>14</td>
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<td>banking institutes</td>
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<td>Industry</td>
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Average number of network operators

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<td>11</td>
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<td>institutes</td>
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<tr>
<td>Non-B.S.W.-based</td>
<td>19</td>
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<tr>
<td>banking institutes</td>
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<tr>
<td>Industry</td>
<td>4</td>
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Average number of helpdesk persons

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<td>B.S.W.-based banking</td>
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<td>institutes</td>
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<td>Non-B.S.W.-based</td>
<td>14</td>
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<td>banking institutes</td>
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<td>Industry</td>
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Average number of job scheduling operators

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<td>B.S.W.-based banking</td>
<td>6</td>
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<tr>
<td>institutes</td>
<td></td>
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<tr>
<td>Non-B.S.W.-based</td>
<td>30 (!)</td>
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<tr>
<td>banking institutes</td>
<td></td>
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<td>Industry</td>
<td>8</td>
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Average number of pages per print operator per day

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<tbody>
<tr>
<td>B.S.W.-based banking institutes</td>
<td>36.710</td>
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<tr>
<td>Non-B.S.W.-based banking institutes</td>
<td>28.125</td>
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<tr>
<td>Industry</td>
<td>24.250</td>
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All of these tables show the same trend. Financial institutes that use the B.S.W.-approach in some form are showing lower operating personnel costs. This seems to confirm a better management of production environment in organisations that use the B.S.W.-approach.

Discussion

The Banking Sector is a well established information processing sector, which presently is almost the only sector segment which still grows in information processing volumes. Consequently, aspects of cost control, production management, I.T. performance monitoring, and so on, are not by accident important in these environments. The strong involvement of centralised information processing infrastructure confirms the affinity of banking institutes with conventional mainframe technology. In a world with increasing hype on downsizing, the need for objective price/performance and I.T. cost/benefit instruments is harder than ever before.

There is no problem in applying the B.S.W.-method to an environment that is using more decentralised information processing. It is only required that each of the "Servers" in the distributed information processing defines itself as a service activity, with a clear inventory of the work activities based on objective work unit definitions. In such a framework I.T.-processing alternatives involving Downsizing and Client-Server processing can be studied and compared to the existing processing situation. The real advantages of such technological opportunities will then become clear.

The results on the application of the B.S.W.-method are encouraging. Although some energy is required to set up the administration and the measurement instruments to support the B.S.W.-approach, increasingly fourth generation languages, like S.A.S. facilitate the easy introduction of such infrastructure. By all means, B.S.W. provides organisation with an integrated analytic framework for capacity planning, cost account and performance reporting.
References


