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BELGIAN RESEARCH ACTION THROUGH INTERDISCIPLINARY NETWORKS

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NETWORK

COORDINATOR

Prof. dr. ir. Joep Crompvoets (KU Leuven – Public Governance Institute)

PARTNERS

- Prof. dr. Geert Bouckaert – Prof. dr. Bruno Broucker – Prof. dr. Ir. Joep Crompvoets (KU Leuven – Public Governance Institute)
- Prof. dr. Monique Snoeck (KU Leuven – Research Centre for Management Informatics)
- Prof. dr. Naji Habra – Dr. Benoit Vanderose (UNamur – Research Centre on Information Systems Engineering)
- Prof. dr. Cécile De Terwangne (UNamur – Research Centre on Information, Law, and Society)
- Ir. Ingrid Vanden Berghe – Jan De Waele (National Geographic Institute of Belgium)

AUTHORS

1. Prof. dr. ir. Joep Crompvoets (KU Leuven – Public Governance Institute)
2. Prof. dr. Monique Snoeck (KU Leuven – Research Centre for Management Informatics)
3. Prof. dr. Naji Habra – Dr. Benoit Vanderose (UNamur – Research Centre on Information Systems Engineering)
4. Prof. dr. Cécile De Terwangne (UNamur – Research Centre on Information, Law, and Society)
5. Maxim Chantillon (KU Leuven – Public Governance Institute)
6. Rink Kruk (National Geographic Institute of Belgium)
7. Anthony Simonofski (KU Leuven – Research Centre for Management Informatics)
8. Thomas Tombal (UNamur – Research Centre on Information, Law and Society)

PROJECT WEBSITE: WWW.FLEXPUB.BE

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EXECUTIVE SUMMARY

The BELSPO BRAIN-be project 'FLEXPUB' aims to contribute to the development of a federal strategy for enabling flexibility, adaptability and innovation in the public sector with a focus on a next generation of geospatial electronic services (e-services). The project, which started in 2016, runs until 2020, and is executed by the KU Leuven, the Université de Namur and the National Geographic Institute. As it is expected that the public e-services will continuously change as citizens and businesses have changing and higher expectations towards the administrations, and as technological developments provide new possibilities, it is necessary to reflect on how the administration, in this study the Belgian federal administration, has to be developed so that it can keep up with the changing needs and technological developments. During the last two decades, the Belgian federal government and administration have taken significant steps to satisfy (tomorrow's) stakeholders, i.e. citizens, businesses and public organisations.

This report is part of a broader set of reports, and follows on the report of Work Package (WP) 2 Baseline Measurement. WP 2 focused on the existing (federal) e-government situation, and analysed the main actors, challenges, needs and current services which are offered by the federal administration. The WP 2 focused as such on the understanding of the current e-government and e-services situation in Belgium, with a particular focus on geospatial data. The following step was to identify, in WP 3 Requirements, the specific future needs, ideas and requirements that the administrations, and in particular the federal administration and organisations have for the future delivery of e-services, with a specific focus on flexibility and innovativeness. The data gathering was structured via the COBIT enablers and it was methodologically decided to organise focus groups to collect the requirements. A total number of 12 focus groups was organised, with participants from all Belgian administrations, but always with a focus on the federal administration and the interaction with the federal administration. Furthermore, an additional citizens questionnaire was conducted to see to what the demands and needs of citizens are for current and future e-services.

As WP 3 aimed to identify the daily requirements faced by the administrations concerning geospatial data and e-services, it fully complements WP 2 as it contributes to answer to the second sub-objective of the FLEXPUB project, namely "*Determine the key requirements for future e-service delivery by the federal administration*". Whereas WP2 focused on the past and current geospatial e-services, the aim of WP 3 was to continue on the timeline and to focus on the future. The team was able to gather, for each of the enablers, a number of requirements. Those requirements are now, together with the identified results of WP 2 used in the following WPs:

- WP 4 Enablers, which focuses on the enablers and in which the team will look for solutions to overcome the existing barriers. Actions will be developed and proposed, and later on tested in WP 5 Case studies;
- WP 5 Case studies, in which the team will focus on the validation of the proposed actions;
- WP 6 Strategy in which the team develops a strategic approach with concrete actions to be taken by the (federal) administration to evolve towards an administration which is capable of developing innovative and flexible e-services;
- WP 7 Blueprint for which the team is currently preparing a view on the future government, thereby making a strong connection to WP 6 Strategy.

This report first fully describes the methodology of the different research activities (Focus Groups and Citizens Questionnaire) and explains why it was eventually decided not to apply the MAMCA Framework. Secondly, the report presents and analyses the results of the research activities. The results are structured according to the different COBIT enablers:

- Processes
- Organisational structures
- Service infrastructure & applications
- People, skills & competencies
- Culture, ethics & behavior
- Principles, policies & frameworks
- Information (i.e. renamed into 'Location-based data')

For reasons explained below, the team decided to add an extra category, namely Semantics.

After this analysis, the next steps are outlined that will be used to move from WP 3 to WP 4, WP 5, WP 6 and WP 7.

1. METHODOLOGY

FOCUS GROUPS

In order to gather the necessary requirements concerning the future geospatial e-services, the team decided to organise focus groups. On the basis of the research results of WP 2 Baseline Measurement, the team was able to create for each set of the enablers a list of topics to be discussed during the focus groups. Those topic and question lists served as a basis for the focus group discussions. However, those lists were not static. The aim was not to discuss only the topics and questions on the lists. Rather the team aimed to stimulate thoughts and debate on the future requirements and to receive concrete feedback from the different stakeholders on the delivery of flexible and innovative public e-services. The data gathered via the focus groups was coded afterwards. First, all focus groups meetings were transcribed, then they were analysed using a semi-open coding approach. The team members approached the transcribed focus groups in such a way that the original requirements identified in WP2 Baseline Measurement were identified, but that also other and new requirements came to the fore.

Each focus group gathered 3 to 10 participants. The team prepared, for each of the enablers a list of potentially relevant administrative organizations and made a selection of potential participants. At the federal level, there is, unfortunately, no overview of who is working were within the administration. Information on civil servants can be found for the higher administrative levels, but not for the other civil servants or staff members. Therefore the team used the social media tool "LinkedIn" to find potential participants of the federal administration as well as the existing contacts. Also, in some cases and at all administrative levels, our existing contacts refered us to potential respondents. This can as such be labelled as a snow-ball methodology. For the Flemish administration, the team used the website of the Flemish administration where information can be found on who is working where. A similar method was used for the Walloon and Brussels Regional administration, as well as for the other stakeholder groups. Depending on the enabler different representatives from the different stakeholders groups were brought together (federal administration, Flemish regional administration, Walloon regional administration, Brussels regional administration, provincial administrations, local administrations or the private sector). For example, when organising the focus group on the enabler "Organisational structures" it was deemed important, due to the previous analysis in WP 2, to focus in one focus group only on the federal level with only participants from the federal level. In this way, the participants would not feel restricted in speeking freely on they issues and requirements at the federal level. Practical guidelines on how to conduct scientifically correct focus groups were taken from Morgan (1997) and Stewart, Shamdasani & Rook (2007).

An overview of the different focus groups that were organised can be found below in Table 1. As can be seen in the table, there have been four researchers conducting focus groups. Each researcher is also the key responsible of the enablers for which he conducted the focus groups throughout the whole project. In this way each research can further develop his expertise for those enablers. It is important to underline that the number of focus groups per enabler differs from one to three. This is the consequence of logistic difficulties: One is dependent on the availability and willingness of others to conduct focus groups, and there is a need for a higher degree of flexibility from the respondents' side when conducting focus group then when conducting interviews. This led to the unfortunate situation that in some cases only one focus group could be organised, where it sometimes – and in

contrast – led to three focus groups.

The focus groups were all organised according to a similar schema. First, all participants were asked to introduce themselves, and to explain their interest in the topic. It was deemed important that not only our questions were answered, but also that each of the participants had a satisfying feeling after the meeting. The team considered those meetings also as an opportunity for the particpants to meet each other and to learn from each other – in light of the work done for WP 9 and WP 10. Secondly, after the introduction, open questions were asked on the challenges found in WP 2. However, also here, as it were focus groups, it was deemed important that the participants could add other topics when considered relevant. Finally, at the end of the focus groups, an oral summary was give by the focus group leader, i.e. the researcher. The analysis of the data took place in two steps. First, the recorded data was transcribed, and afterwards a semi-open coding scheme was applied. Based on the identified challenges of WP 2, a number of codes were developed. However, as other topics were also discussed by the respondents, it was important to allow also for the inclusion of new codes on the basis of the transcriptions itself.

Table 1: Number of Focus groups by Enabler and Researcher

Enabler	Researcher 1	Researcher 2	Researcher 3	Researcher 4
Processes	X (3 focus groups)			
Service Infrastructures	X (1 focus group)			
People, skills & competences		X (1 focus group)		
Principles, policies & frameworks		X (2 focus groups)		
Culture, ethics & behaviour			X (1 focus group)	X (1 focus group)
Organisational structures				X (2 focus groups)
Semantics & location-based data			X (2 focus groups)	

Within those focus groups, potential solutions that could be deployed later on were also discussed, but this will be analysed in WP 4 Enablers. As a final step, the data that is analysed for each of the focus groups will be brought together, in WP 6 and WP 7, i.e. Strategy and Blueprint, to define a number of ideal strategies for the development of flexible and innovative geospatial e-services.

Hereunder some specific information can be found on the focus groups organised for each enabler. Table 2 provides some extra information on the number of participants of each focus group, as well as the data on which it took place.

- **Processes**: Due to the higher requirements of citizens and the collaboration environment in government, tradititonal systems development methods (Waterfall) might not be adequate anymore. Indeed, Agile methods could be a lead for solution to the current requirements. Thus, we organised three focus groups to understand which requirements practitioners have when trying to implement agile methods in an e-government context. The participants of the

focus groups came from regional and local governments with different agile expertise and hierarchical positions.

- **Service Infrastructures**: In order to better understand the requirements of stakeholders regarding the service infrastructure necessary to enable flexible e-service, one focus group on "User Friendliness and Architecture" was performed. However, a large part of the findings also discussed the impact of the General Data Protection Regulation of the back-end service infrastructure and how it may impact other features (e.g. user-friendliness). Topics such as necessary infrastructure to ensure data security, data privacy and data traceability were discussed. Furthermore, the impact on user-friendliness and citizen control were also discussed. Participants belonged all to the federal administration.

- **People, skills & competences:** One focus group was organised with civil servants of the Federal and Waloon administration. It gathered four participants and it was held in Namur in mid-December 2017. This allowed to show that both entities were facing the same issues. Civil servants of the Brussels Region and of local municipalities in Wallonia had also expressed an interest in participating to such a focus group, but it was impossible to find a date that would suit representatives from all of these groups.

- **Principles, policies & frameworks:** Two focus groups were organised on this topic. The first one gathered six participants and was held at the National Geographic Institute in Brussels in the beginning of November 2017. The participants came from the Federal administration, the Flemish Region, the Brussels Region and the city of Brussels. Unfortunately, the Waloon Region could not be represented. The second focus group was organised at the end of November 2017. It gathered five people attending this meeting, including civil servants from the European and Federal level, as well as a representative of the private sector.

- **Culture, ethics & behavior:** One focus group was organised on this topic, whereby the four participants where employees of the Federal administration. This focus group took place at the beginning of December 2017. Although it was deemed important to organise a second group, and although there was sufficient interest from participants, it was impossible to find a common date in January or February 2018. Also, an interview took place on this topic: A focus group was originally organised, but as a number of participants cancelled their participation and it was too late to contact the only remain participants, it was decided to conduct an interview with this respondent on the topic. Unfortunately, neither the Walloon nor the Brussels regional administration responded to the request for an interview.

- **Organisational structures:** Two focus groups were organised on this topic. Emphasis has been put on the federal administration as this remains the target administration. A first focus group was held at the end of November 2017, a second one at the beginning of December 2017. During both discussions, the starting point was the current organisational situation. A major requirement is the need to find a balanced structure that guarantees the organisational independence of the different federal organisations, while also allowing for a common federal approach.

- **Semantics & location-based data:** Two focus groups have been organised on (1) the meaning of location-based data and e-services and (2) on the coordination of location-based

data in a multi-level government context. It was asked to what extent administrations foresee a link between e-services and location-based data. The first focus-group was organised at the end of November 2017 with five participants from the federal administration and an interfederal organization. The second focus-group was held in March 2018 with representatives from the local government, the federal administration and the three regions.

Table 2: Number of Participants and Date of Focus groups

	Focus group	Responsible Researcher	Number of participants	Date of focus group
Processes	1	1	8	08/11/2017
	2	1	5	17/11/2017
	3	1	7	13/11/2017
Service Infrastructures	1	1	4	01/02/2018
People, skills & competences	1	2	4	15/12/2017
Principles, policies & frameworks	1	2	6	10/11/2017
	2	2	5	20/11/2017
Culture, ethics & behaviour	1	3	1	07/11/2017
	2	3/4	4	16/11/2017
Organisational structures	1	4	3	07/11/2017
	2	4	3	16/11/2017
Semantics & location-based data	1	3	5	20/11/2017
	2	3	5	07/03/2018

The results of these focus groups can be found in "3. Requirement analysis ", in the sub-requirements corresponding to the topics detailed in this section.

EXCLUSION OF MAMCA FRAMEWORK

In the original research proposal it was planned to use the Multi-Actor Multi-Criteria Analysis (MAMCA) method developed by Macharis (2005) to "*evaluate different sets of requirements with regards to the objectives of the different stakeholders that are involved in the decision making*" (FLEXPUB Research Proposal, 2015). Those requirements were identified in WP 2 and subsequently described in the WP 2 Report. Although a useful framework, already applied in different research contexts (see for example Macharis & Crompvoets (2014)), the team judged that a complete MAMCA would be unnecessarily heavy and resource consuming at this stage of the research project. Indeed, it would have a major time consuming impact on the organisations participating in the FLEXPUB Follow-up Committee. Given that WP 2 Baseline Measurement already demanded a high commitment from the different organisations involved in the project, the team wanted, in a certain way, to spair their involvement for the later phases of the research project, i.e. the strategy and blueprint development (WP 6 and WP 7) as well as the case studies (WP 5).

The MAMCA analysis of WP 3 was therefore replaced by a number of focus groups (see above for an overview of this methodology). Bringing together different stakeholders, from different organisations and from possibly – but not necessarily – different administrative levels, creates the possibility for a stimulating discussion on the identified requirements. This discussion, between the different participants – stimulated and led by the researcher in charge of a certain enabler – allowed to detect what requirements are deemed most important, as well as to detect those that are the least important. Furthermore, those discussions allowed to detect other aspects of the different requirements and to understand what actions have already been taken by the different organisations and/or administrations. Finally, and in light of a project such as FLEXPUB that aims to have an impact on the administration, it is highly useful and stimulating for the staff of the different administrations to come together and to discuss a certain enabler for around two hours. Also, the focus groups allowed the staff of different organisations and administrations to meet colleagues of other organisations and administrations. In this way, they could reflect together on common issues, needs and requirements and exchange good practices among each other. This approach does not only contribute to WP3 but also to WP 10 Exchange and Dissemination.

Although the team recognises that the result of a focus group analysis is different from a MAMCA analysis in the sense that a more qualitative approach is taken, the team wishes to underline, in light of the tasks of WP 9 and WP 10, that the added value towards the administrations via this approach higher and might therefore be more useful for both the administrations and the next Work Packages of the research project.

CITIZEN QUESTIONNAIRE METHODOLOGY

A questionnaire was designed in order to take into consideration the point of view of another important stakeholder group, namely the citizens. For the purpose of this project, all Belgian citizens that interact with e-government services, excluding however public servants and political representatives, belong to the target group and are defined as "citizens".

The main goal of this questionnaire was to understand how the citizens would like to be considered in the e-government approach of public administrations. This research objective is to understand what citizens expect from the e-government approach of public administrations. Since we have found several considerations for citizens in literature (citizens as customers, as democratic participants and as participants in delivery process), the questionnaire aimed to understand what model they prefer and which characteristics influence this role. The dependent variable is thus "Consideration in e-government" and the goal of the questionnaire is to evaluate the relation of independent variables, such as age, gender, digital literacy, location and job type, with this consideration. This allowed us to establish a taxonomy of citizens' profiles and their view on e-government. However, this research activity will be published in a further work. In this report, we present the already helpful descriptive statistics that emerged from the questionnaire.

We performed a survey (convenience sampling with monitoring of target demographics, i.e. age, employment, gender) and gathered the data through an online questionnaire. We followed survey methodology best practices while performing this research. We chose to use Likert scales in order to evaluate the importance of each statement for the citizens. These statements are all positively formulated. Thanks to the questions about socio-demographic elements, digital literature and e-

commerce use, we identified constructs that influence the consideration of citizens towards e-government. Furthermore, we also asked each Likert scale question from two perspectives, namely a local and a regional/federal one in order to differentiate the impact of level on the citizens' perspective). Thus, for each statement, respondents had to give their opinion for their city and for their region/state. For instance, the statement below evaluates the consideration "citizen as participant in service delivery" and is formulated as follows:

> "I would take the time to participate in the development of public e-services of your CITY-REGION/STATE if this opportunity was given to you (e.g. by communicating your requirements, testing the services,..)"

The other considerations consisted of "Citizen as democratic participant" and "Citizen as customer". After the questionnaire design, we applied a data gathering strategy based on convenience sampling. Despite some limitations such as the potential lack of representativeness, convenience sampling has been applied in the past. This sampling method has been applied in similar studies to collect data from people with no specific motivation to provide information and has advantages such as control over the chosen samples and faster data collection In order to gather the data. Quota sampling allowed us to reach representativeness in terms of socio-demographic distribution (age, gender, employment). We applied a multi-channel strategy to avoid bias in the study (e.g. because of digital literacy). We put the questionnaire online and presented it through social media and local community websites. Furthermore, we also printed paper versions of the questionnaire and performed face-to-face interviewing in the city of Namur (Belgium). The data gathering phase for this questionnairelasted from June 2017 to October 2017. This questionnaire produced 203 responses.

The questionnaire can be found in Annex 1.

2. CITIZEN QUESTIONNAIRE RESULTS

SOCIO-DEMOGRAPHIC DISTRIBUTION

In this section an overview of the demographic distribution of the respondents by (i) age, (ii) gender, (iii) level of education and (iv) level of employment can be found. The respondents' socio-democraphic characteristics show an overall balanced distribution. There is however quite a strong presence of the age category 20-29 (39,9%) and the presence of students (33%) in the employment category. It has to be recognised that these are two limiting factors for the overall study.

Table 3: Citizens Questionnaire – Age Interval

Age interval		
	Absolute number	**Percentage**
>20	21	10,3
20 – 29	81	39,9
30 – 39	26	12,8
40 – 49	30	14,8
50 – 59	24	11,8
< 60	21	10,3
Total	**203**	**100**

Table 4: Citizens Questionnaire – Gender Distribution

Gender distribution		
	Absolute number	**Percentage**
Male	111	54,7
Female	92	45,3
X	0	0
Total	**203**	**100**

Table 5: Citizens Questionnaire – Education Distribution

Educational distribution		
	Absolute number	**Percentage**
PhD degree	19	9,4
University degree	69	34
High school degree	39	19,2
Secondary school degree	75	36,9
Primary school degree	0	0
No degree	1	0,5
Total	**203**	**100**

Table 6: Citizens Questionnaire – Occupational Position

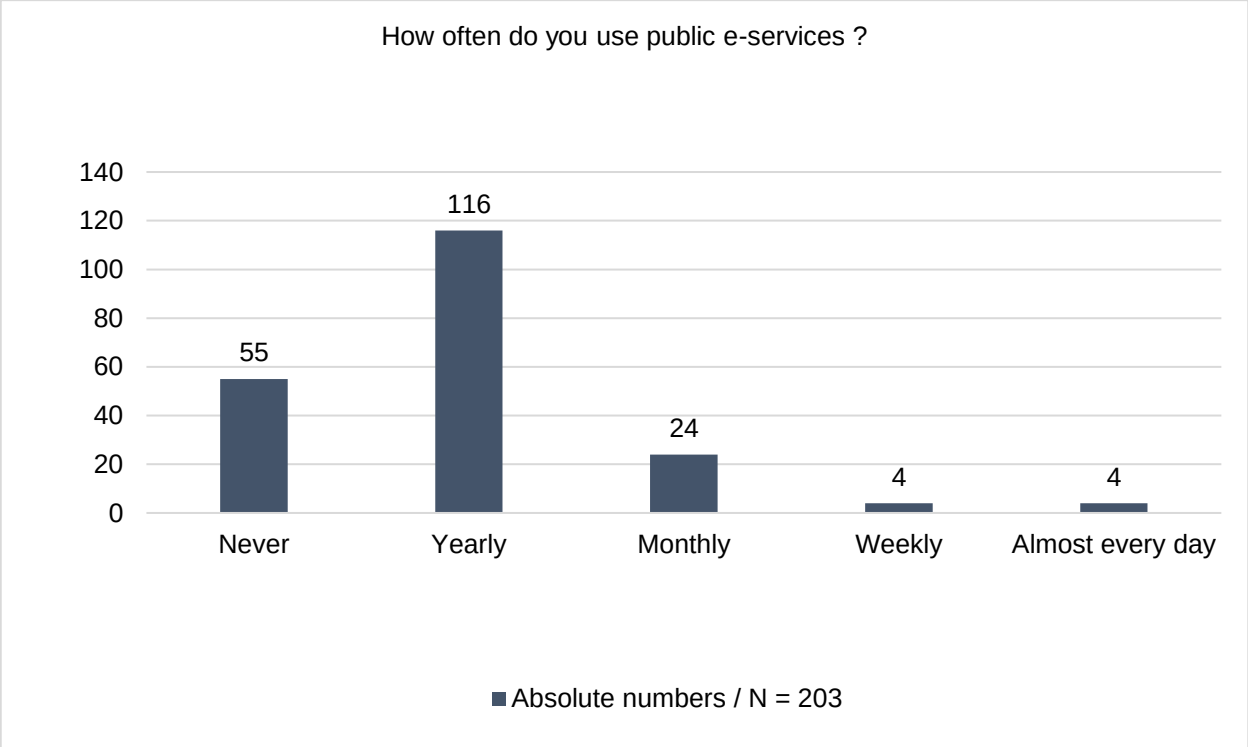
Occupational position		
	Absolute number	**Percentage**
Student	67	33
Employed	99	48,7
Self-Employed	14	6,9
Non-Employed	7	3
Retired	16	7,9
Total	**203**	**100**

The other sections for this questionnaire first relate general questions about use of public e-services and then focus on the opinions of citiziens about their three possible consideration in e-government: participant in service delivery/democratic participant or customer.

GENERAL QUESTIONS

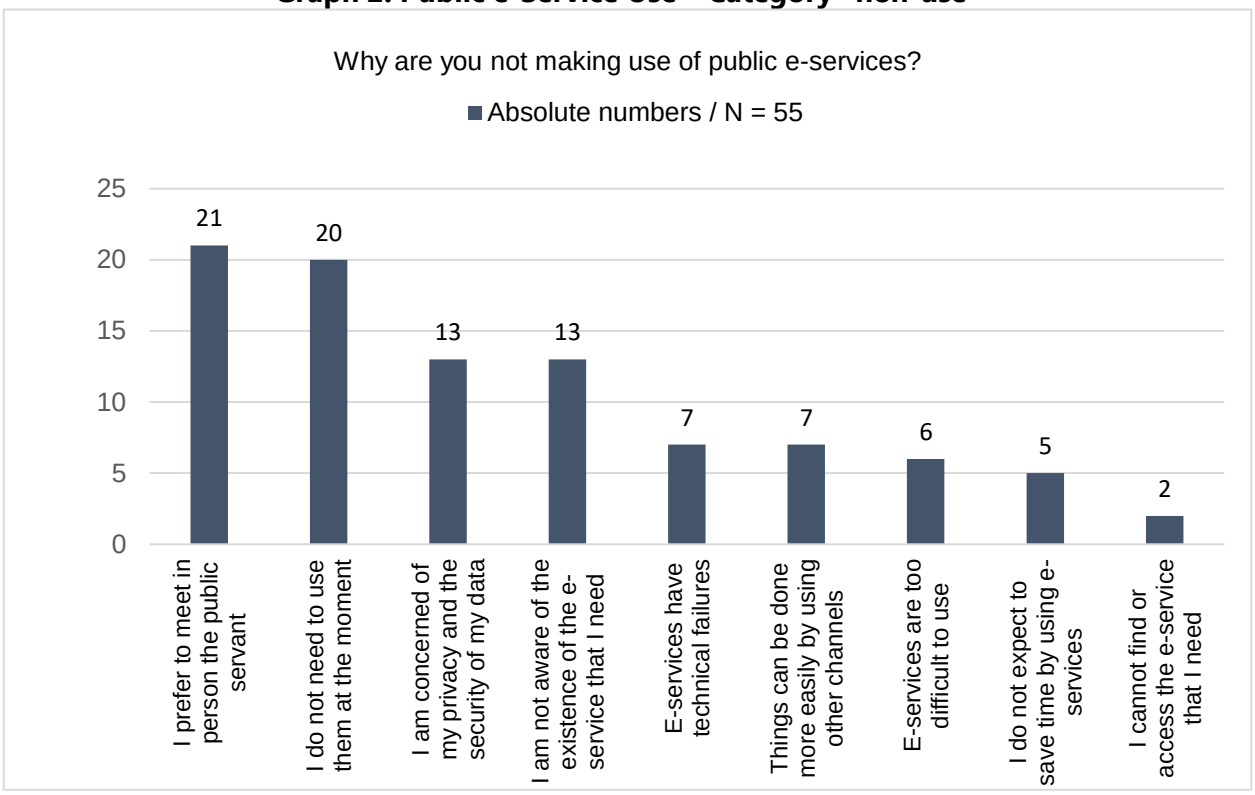
First, some general questions about the (non-)use of public services were asked in order to have an overview of the current status of the use of public e-services. Furthermore, we also asked some questions about the drivers and barriers to use these services.

Graph 1: Public e-Service Use



The vast majority of citizens only uses e-services on a yearly basis. It can be explained by the fact that the needs emerging to use these services happen quite rarely. An example of an annually used e-service is the online tax declaration service of the Federal Public Service Finance. Out of the 203 respondents, 55 stated that they never use e-services. The figure below explains what barriers prevent them from using the e-services.

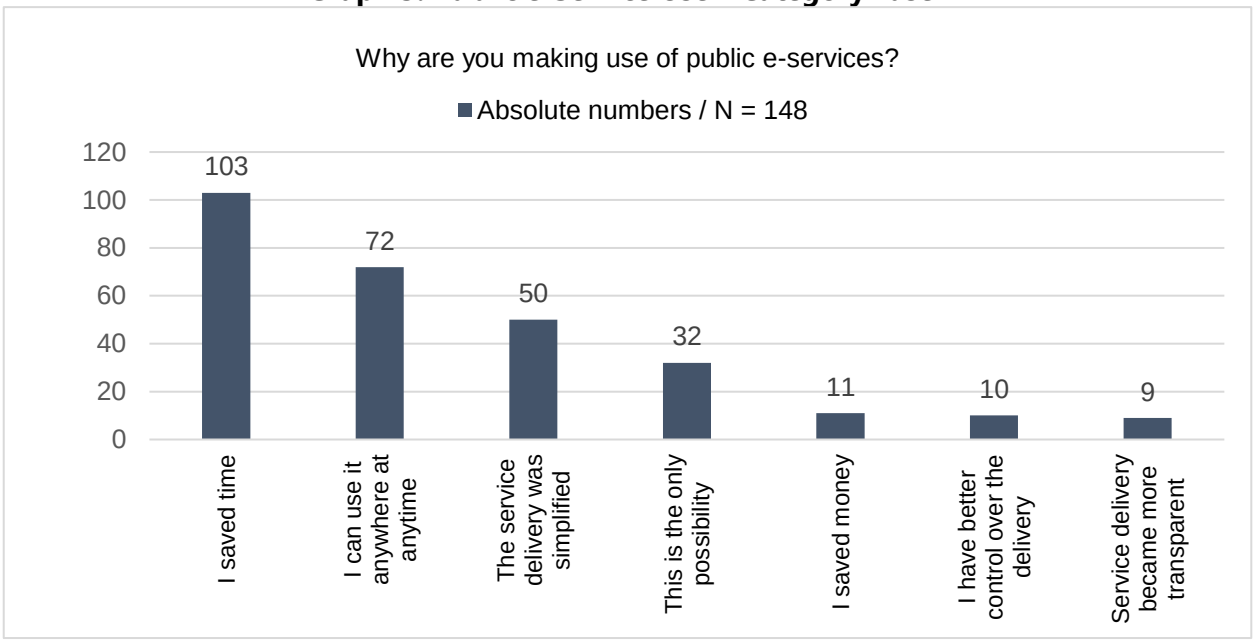
Graph 2: Public e-Service Use – Category "non-use"



The main reason for the non-use resides in the fact that respondents prefer to meet civil servants face-to-face. The second main reason resides in the lack of current need(s). This can be explained by the fact that there was a large part of students in the respondent distribution.

Below is a table outlining the drivers that motivate citizens to use e-services. The main reasons for using e-services are efficiency purposes. On the other hand, the more "democratic" reasons, specific to the public sector, such as transparency and control are quite marginal in the drivers.

Graph 3: Public e-Service Use – Category "use"



CITIZEN ROLE IN E-GOVERNMENT

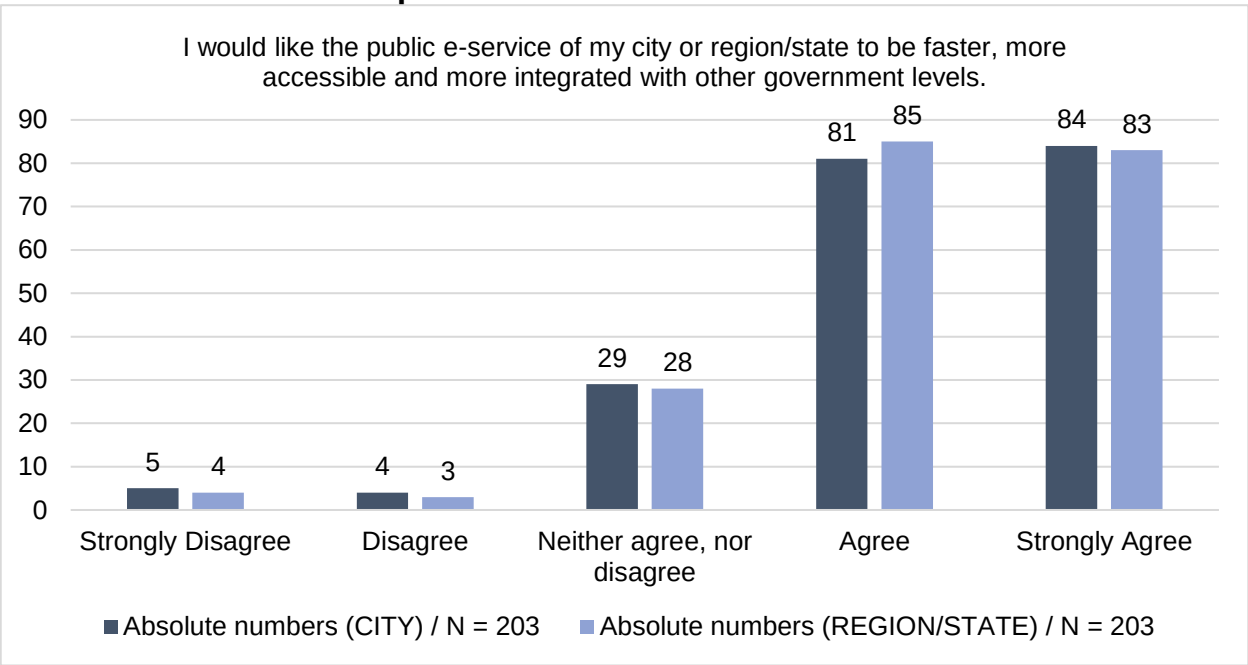
In this part of the questionnaire, through the use of Likert scale questions, the team estimated how citizens would like to be considered in e-government. 'Consideration' refers to the role of the citizens in an e-government context. If the public servants consider the citizens in a certain way, the e-government strategy will be adapted accordingly (e.g. if the consideration 'Participants' was chosen or followed, the e-government strategy was expected to be more citizen-centric). For each statement, we asked the respondents how much they agreed with it, first for their city (local level) and then for their region/country (regional/state level).

An overall finding shows that they are no major differences in the local and regional/national levels in the responses of this study.

CUSTOMER ORIENTATION

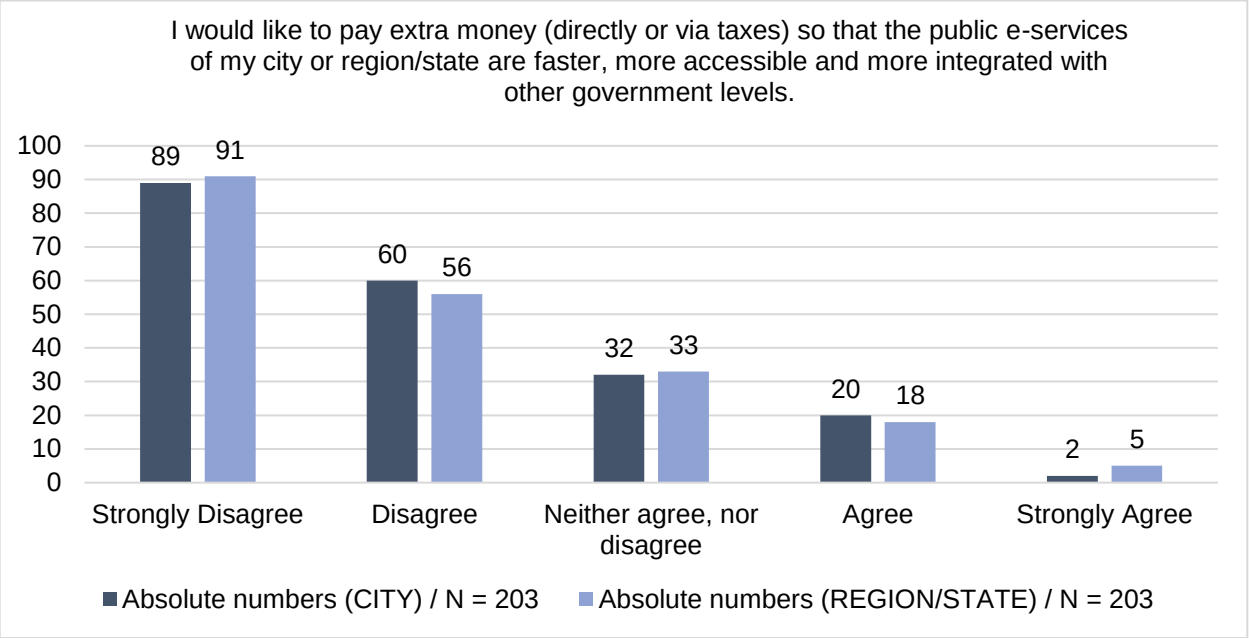
The figures in Graph 4 show that, both at the local and regional level, the respondents are in favour of e-services that are faster, more accessible and more integrated with other governmental levels. Those number are as such not a surprise. What is however suprising is the fact that there are equal expectations for both the local and regional level – one could have thought that the local level, as a result of the higher accessibility that exists at this level – would not be required to focus to this extent on public e-service development.

Graph 4: Public e-Service Characteristics



In order to gain a deeper understanding of the possibilities that the local and regional level have with regards to the financing of public e-services, the team assessed the possibilities of increasing taxes in order to offer improved e-services. Indeed, developing e-services and an overall e-government policy is highly costly, especially in the first years. Therefore extra investments might be necessary. The survey learned however that most respondents disagreed or strongly disagreed with the proposition of paying extra taxes for better e-services.

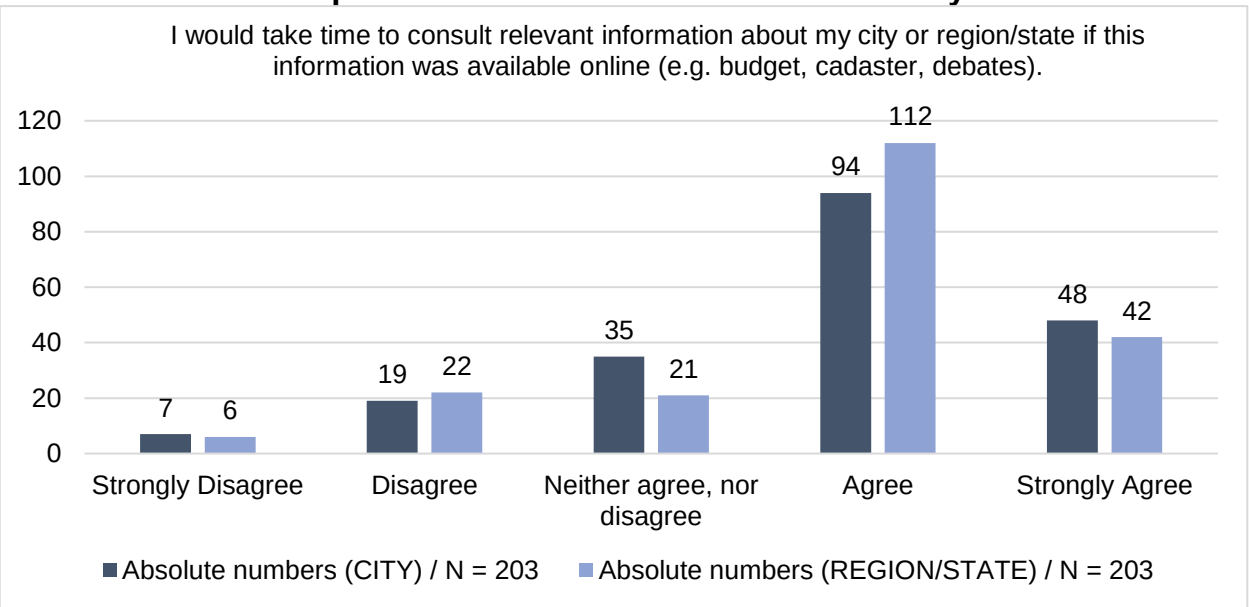
Graph 5: Public e-Service Financing



DEMOCRATIC PARTICIPATION

In order to gain a deeper understanding in the willingness of citizens to participate in the e-service development process, the team inquired about the willingness to use information if this is online available and the willingness to participate in online democratic processes. Graph 6, on the online information, learns that a large majority would like to consult relevant information, both at the local and regional level, if available online. What is however also clear is that most respondents "agree", the group that ticked "strongly agree" is smaller.

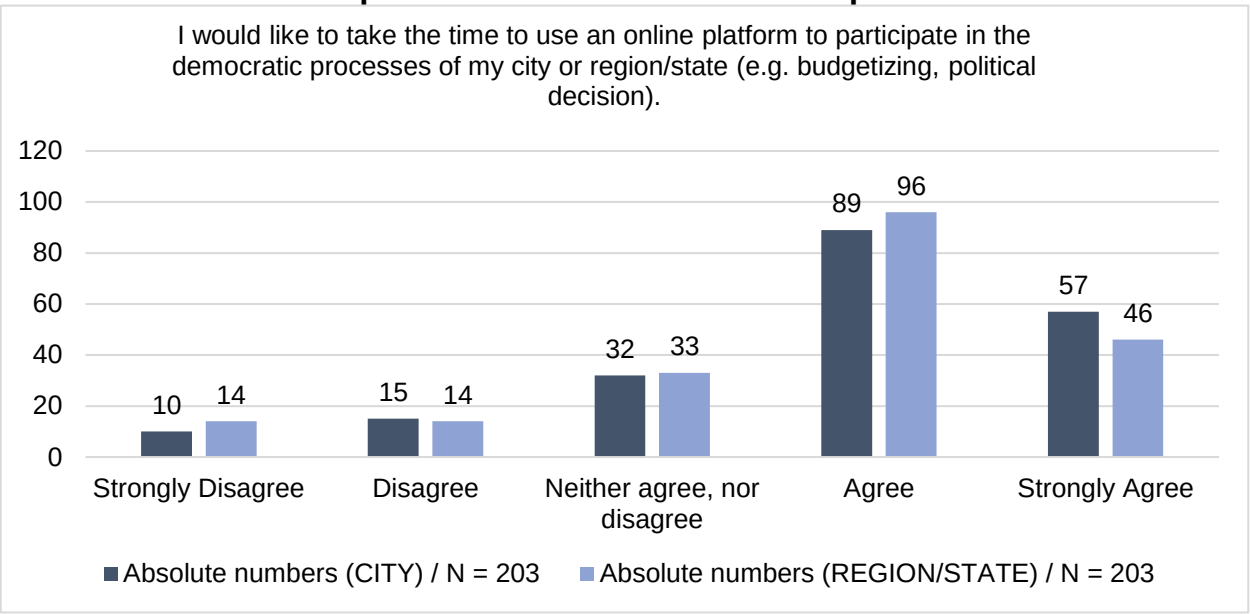
Graph 6: Public e-Service Information Availability



Graph 7, on public e-service online participation, shows a clear trend that is fully in line with Graph 6 on information availability. Most respondents agree and strongly agree with the statement. Indeed, a

large group of citizens would like to take the time to use an online platform to participate in democratic processes. Once more the distribution between local and regional level is highly equal.

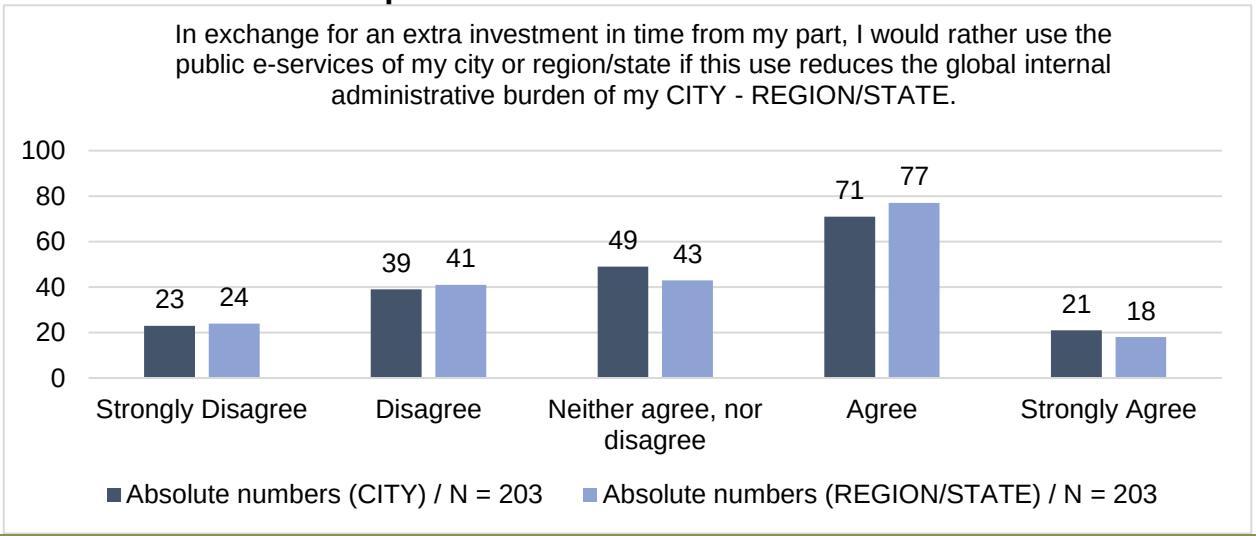
Graph 7: Public e-Service Online Participation



COPRODUCER

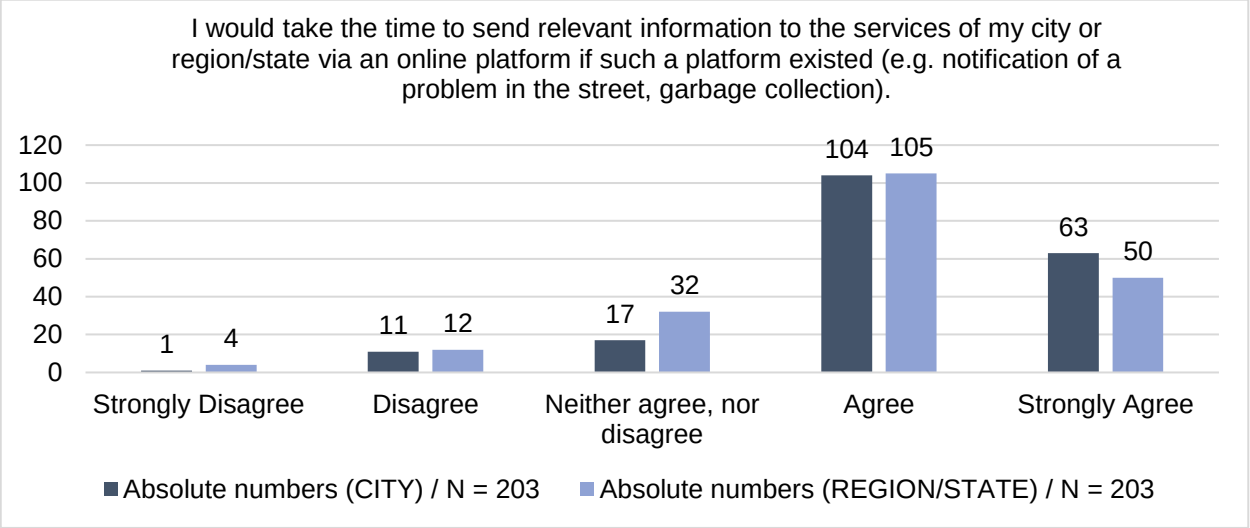
Following the previous section, the team decided to look deeper into a number of other factors that are important to understand to what extent citizens want to make investments in the co-production of e-services. Graph 8 analyses the time investments of citizen: Are citizens willing to invest extra time in the development of e-services if this reduces that the overall internal administrative burden, both at the local and regional level. The results are more nuanced that for the previous graphs. Indeed, the group of citizens that agrees is still the largers, but the group that disagrees and strongly disagrees is of equal size as the group that agrees. Finally, also the group that takes a middle position cannot be neglected. Overall, only certain citizens seem to be willing to invest extra time in the development of e-services with the administration.

Graph 8: Public e-Service Time Investment



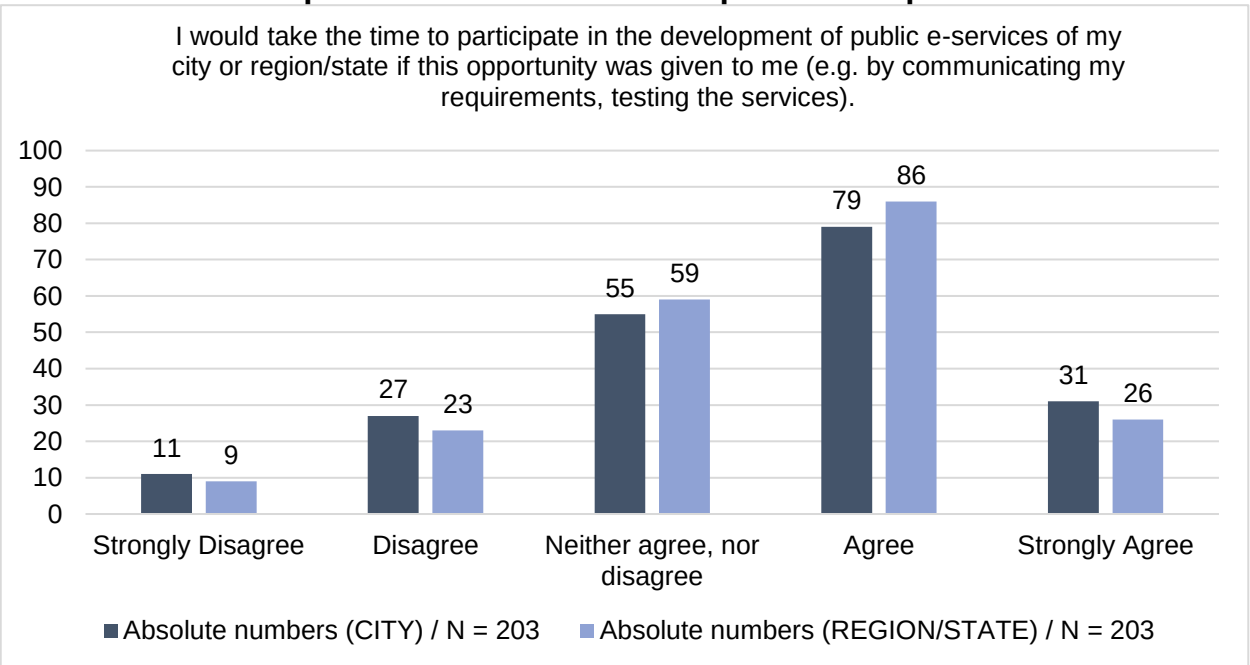
Graph 9 focuses on the communication tools for the connection between citizens and their public administration, again at both the local and regional level. The team tries to understand if an online tool could be helpful to develop a closer relation between both groups. A large group of citizens agreed and strongly agreed with the proposal of such a platform. An easy accessible platform seems to be a tool that can improve the accessibility of administrations: It allows citizens to provide the administration in a simple way with feedback.

Graph 9: Public e-Service Communication Tool



A slightly different image is found on the actual participation in e-services. As shown in Graph 10, on development participation, most citizens once more agree or strongly agree with the statement: They state that they would indeed take the time to participate in the development of public e-services, when they would have this opportunity. However, and this is highly relevant, there is also a large group of undecided respondents: Those respondents probably have deeper needs or wishes that need to be fulfilled before they are willing to participate.

Graph 10: Public e-Service Development Participation

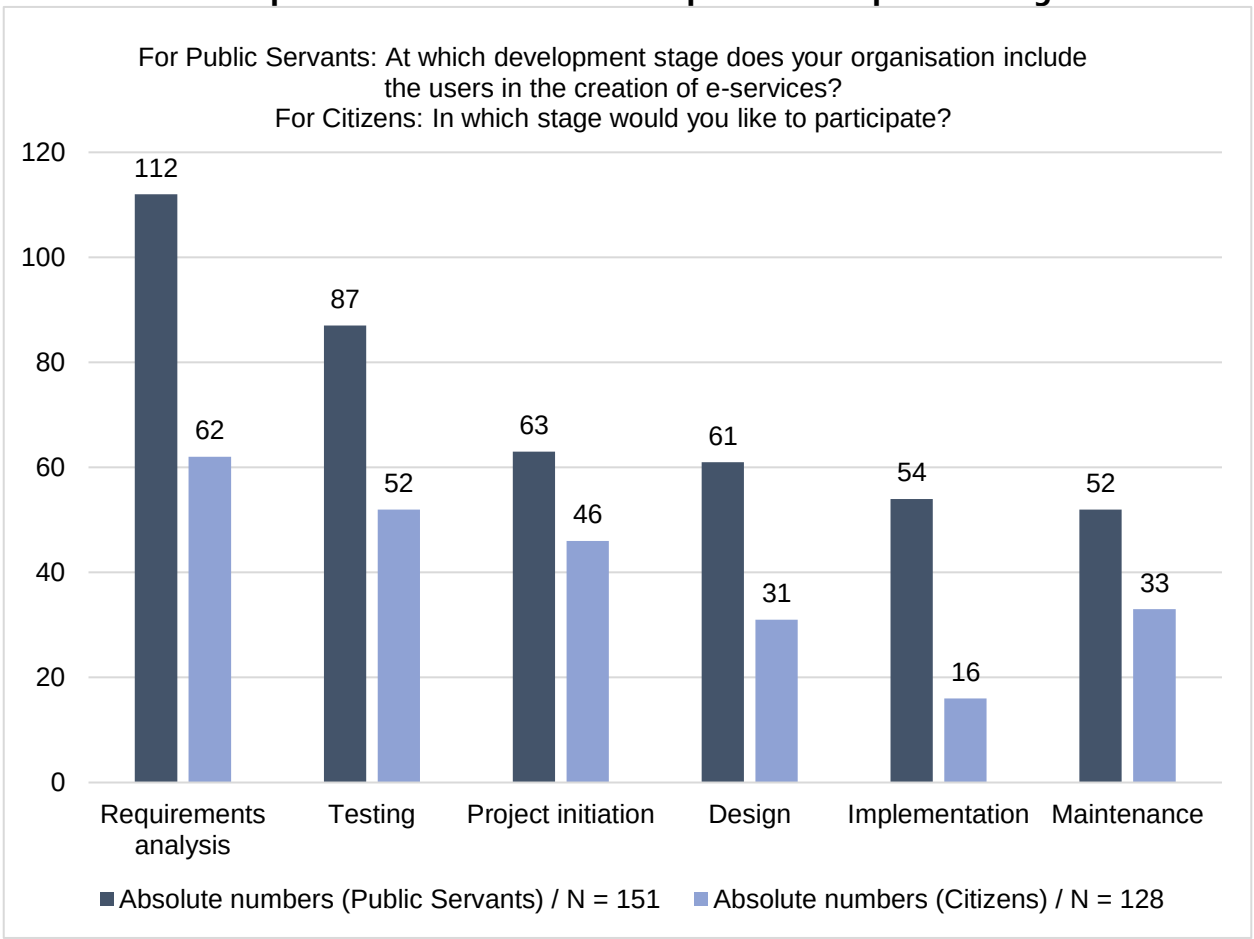


CITIZEN-PARTICIPATION IN SERVICE DELIVERY

In this section, the team took a deeper look in the participation of citizens in e-government service delivery. This sub-section refers to the fact that citizens can add value in the processes of administrations thanks to their ideas, expertise and explanation of needs. This is strongly linked to the "Stakeholders' participation" requirements identified in the WP 2 Report.

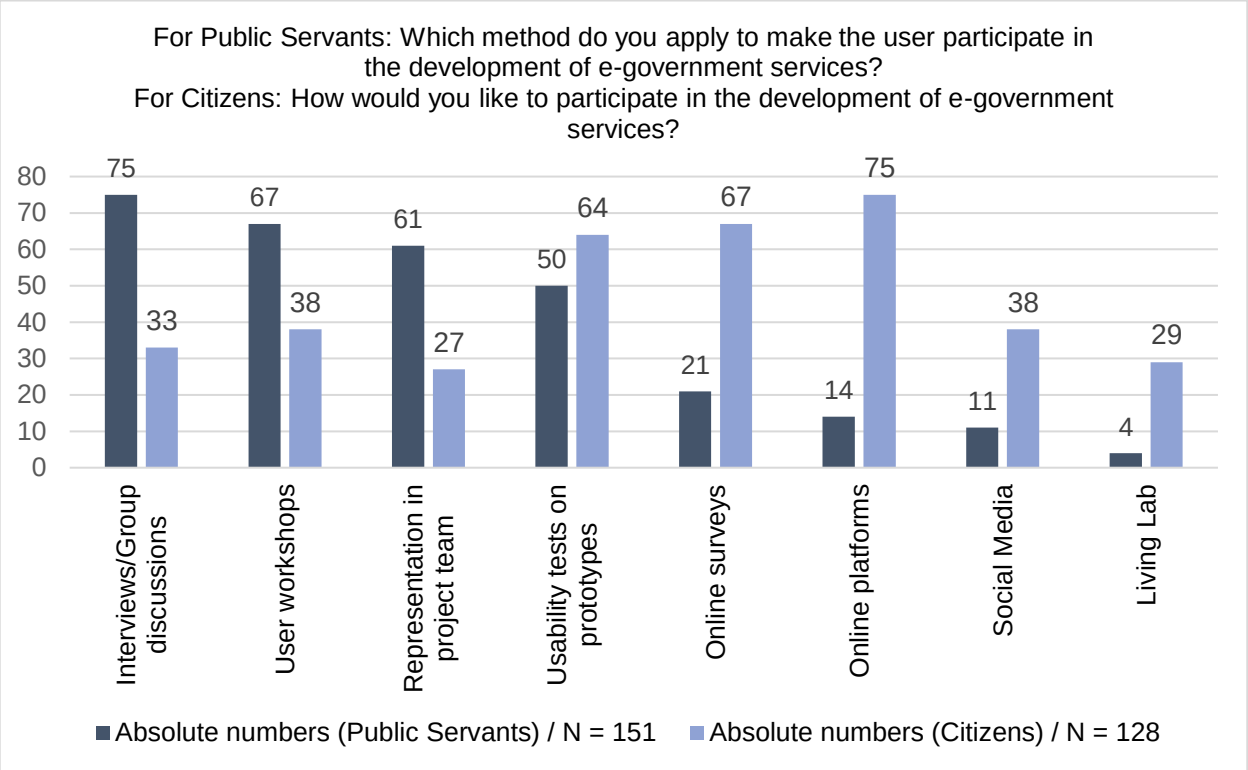
Graph 11 shows the different stages in which citizens can participate in the e-service development process. A division an be made between public servants and citizens. The data for public servants shows clearly that most of the time users are involved in the 'requirements analysis' and 'testing' stages. The users are less involved in the other stages. This is especially suprising in the 'project initiation' and 'design' stage. When looking at the citizens data, it becomes clear that this data is very much in line with the public servants data – except for the stages 'design' and 'implementation'.

Graph 11: Public e-Service Development Participation - Stages



Graph 12 on the participation methodology and again making the division between public servants and citizens, shows a clear mismatch between the two groups. This is highly relevant data, as there is strong room for improvement and closer attunement of both groups. Citizens do seem mostly interested in 'online platforms' for participation, whereas public servants use this only to a limit extent.

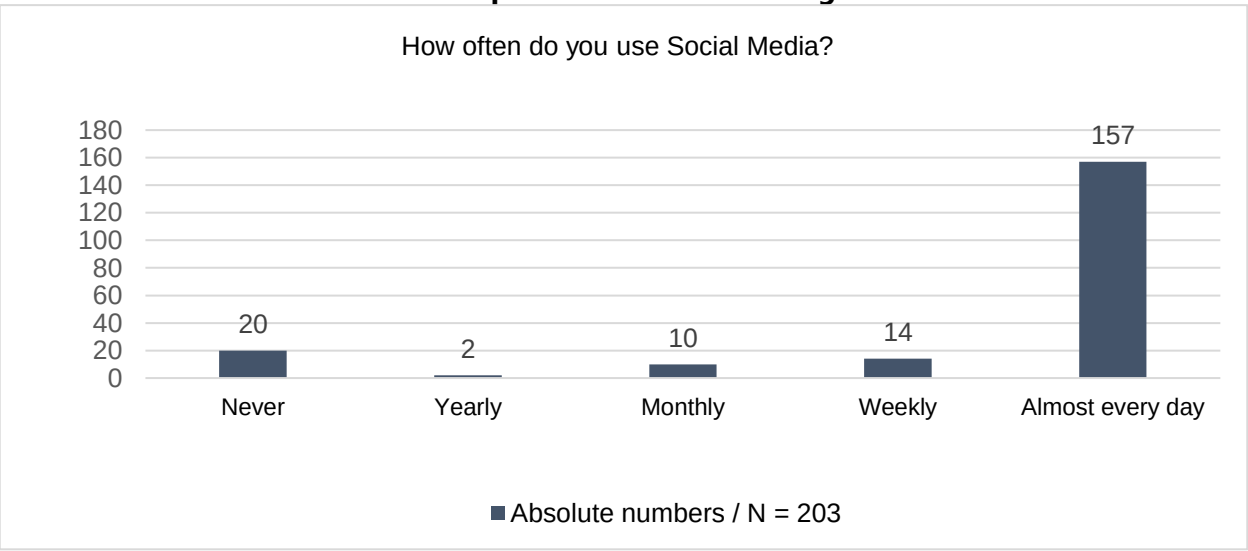
Graph 12: Public e-Service Development Participation - Methodology



E-COMMERCE USE

In order to compare the findings of the e-government domain, we also asked citizens questions about their use of **private** e-services, or online services provided by the private sector without any connection to the public sector. It is interesting to underline that citizens use these e-services much more extensively than the public ones. However, this can be explained partially by the fact that citizens come less often in contact with e-government services in comparison to private e-services.

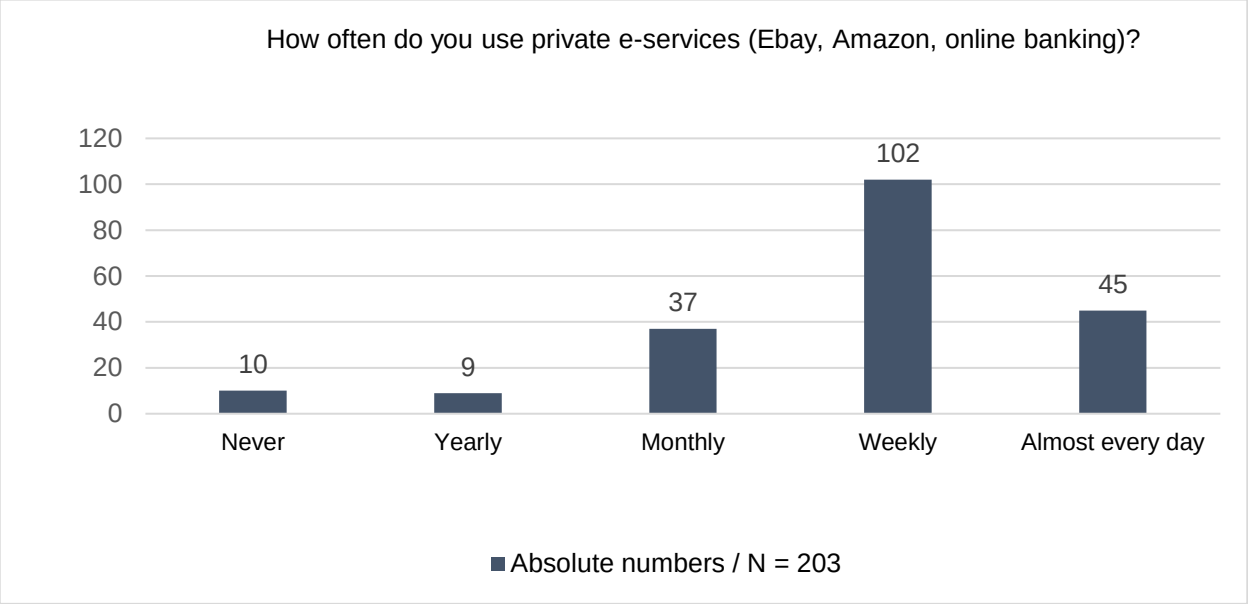
Graph 13: Social Media Usage



As can be seen in Graph 13, most of the respondents use, on a daily basis social media tools.

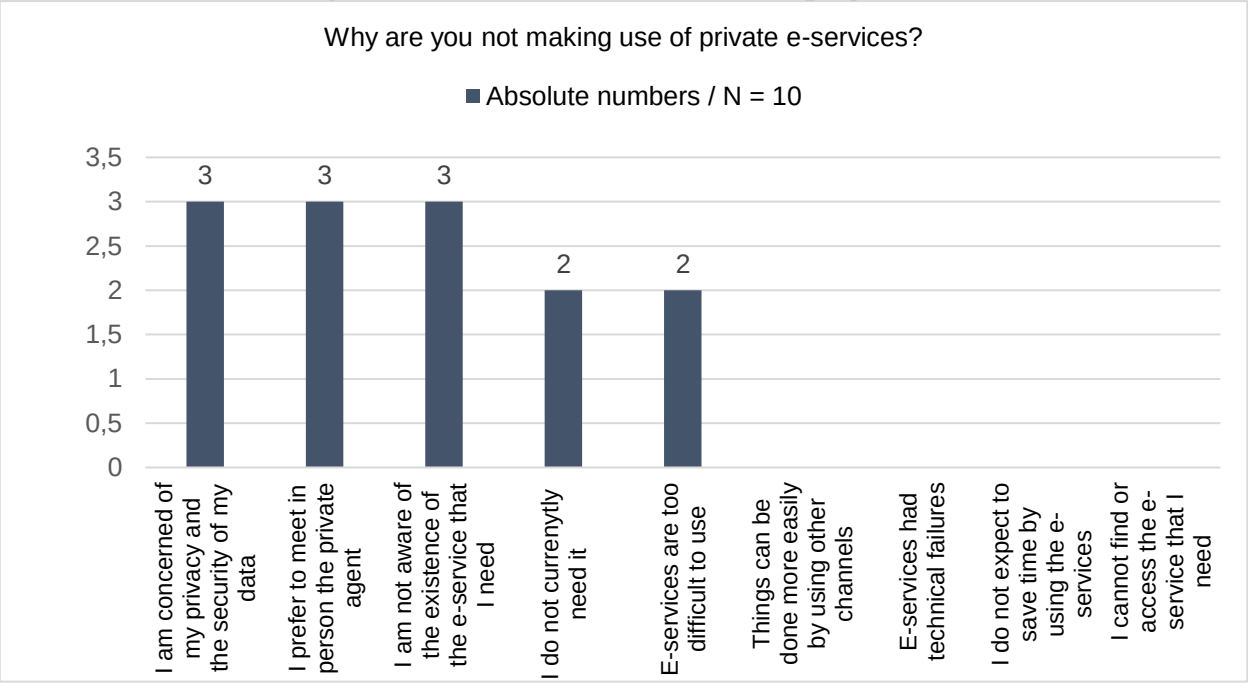
Interesting, 20 out of the 203 respondents never use social media. Graph 14 focuses on the use of private e-services, such as Ebay, Amazon or online banking tools, most respondents do indeed use those services, and a large group – more than half of the respondents – uses it on a weekly basis.

Graph 14: Private e-Service Use



Graph 15 and 16 show the results for the reasons why citizens use and do not use private e-services. On the non-use, shown in Graph 15, it is necessary to take into account that this group only exist out of 10 respondents. The data is, as such, not representative. The reasons mostly indicated are 'privacy and security concerns', 'preference for personal contact' and 'unaware of the existence of e-services'.

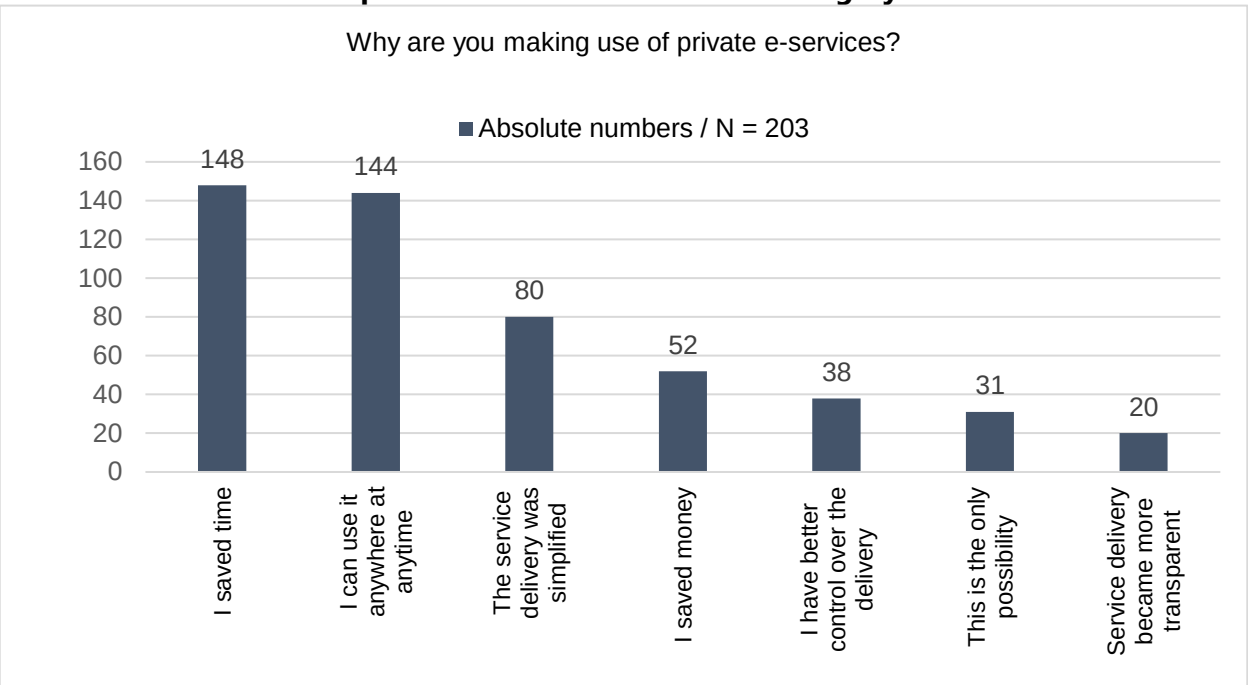
Graph 15: Private e-Service Use – Category "non-use"



Graph 16, on the reasons to use private e-services, clearly shows that most respondents use the

services because it saves them time, and because they can be used anywhere at anytime. Other reasons are less important.

Graph 16: Private e-Service Use – Category "use"



3. REQUIREMENTS ANALYSIS

The results are structured on the basis of the enablers of the "COBIT 5 framework", which are the guiding principles within the whole research project. These enablers are the following (ISACA, 2012, p. 27):

- **Processes** "describe an organised set of practices and activities to achieve certain objectives and produce a set of outputs in support of achieving overall (IT-related) goals".
- **Organisational structures** "are the key decision-making entities in an [organisation]".
- **Service infrastructure and applications** are "the infrastructure, technology and applications that enables the [organisation] to deliver its information and services to its users".
- **People, skills and competencies** are the human knowledge and resources "required for successful completion of all activities and for making correct decisions and taking corrective actions".
- **Culture, ethics and behaviour** are the values of the organisation and the individuals that determine the ethics and behaviour of both the organisation and the individuals working in the organisation. The behaviour of the individuals influences, together with the organisational ethics, the culture of the organisation, whereby those aspects have their own life cycle.
- **Principles, policies and frameworks** "are the vehicle[s] to translate the desired behaviour into practical guidance for day-to-day management".
- A final enabler defined by the COBIT 5 framework is "**Information**" and can be described as "pervasive throughout any organisation and includes all information produced and used by the enterprise. Information is required for keeping the organisation running and well governed, but at the operational level, information is very often the key product of the enterprise itself". The researchers decided however to specify this enabler. Instead of keeping the name "Information", it has been decided to refine it to "**Location-based data**", as the focus of the research project lies on e-services, which require data and specifically geospatial data (also referred to as "location-based data" in this report).

An extra category ("**Semantics**") was added to analyse the data that is linked to the different definitions that are used in the field for the concepts "**Location-base data**" and "**e-services**".

ENABLER 1: PROCESSES

In this enabler, we identified, through 3 focus groups, the different requirements that stakeholders would like to see being addressed in the development process of e-services. One possible lead for solution discussed was the implementation of Agile methods in administrations. These methods refer to the use of several practices to facilitate participation such as time-boxed iteration, increased user involvement, multi-disciplinary teams or daily meetings. However, the agile practices are sometimes more difficult to implement in certain context. The focus groups aimed at identifying which requirements need to be addressed in administrations in order to enable the implementation of Agile methods.

LACK OF INTERNAL COMPETENCES

The most important requirement that prevents practitioners from implementing agile methods in

administrations comes from the lack of internal competences. Firstly, it is hard to find a common lexica and understanding with other public agents to discuss the advancement of projects (e.g. "What is a Sprint?"). Secondly, there is a lack of transdisciplinarity within development teams although it is considered one of the main best practices in Agile methods. Most developments in e-government projects are specialised with clear-cut tasks to perform.

This lack of competences is not specific to the e-government domain but can be a result of the low public sector attractiveness as reported by some participants working at the strategic level. Administrations have difficulties to attract specific profiles to facilitate the implementation of Agile methods. However, it can also be the result of the low investment by public sector leaders and top-managment in the implementation of methods with no immediate pay-off.

USER PARTICIPATION

The second most reported thematic requirement resides in the difficulty to stimulate external stakeholder participation. Customer involvement is another essential agile practice and, in the case of administrations, users can be the citizens, businesses or even other public servants. However, when these users are the citizens, the number and diversity of these users makes it difficult to identify a fitting participation methodology. The use of representatives was discussed in the focus groups but several questions remain unanswered: Can the representative fully understand the needs of the whole user population? How to ensure their availability? The specific case of public servants being users is interesting to discuss as it shows the need for development teams to work not only in an agile way, but also for administrations to adopt, themselves, agile practices, in order to be more reactive and adaptive.

INTERNAL STAKEHOLDER ALIGNMENT

Administrations constitute a diverse ecosystem with multiple internal stakeholders who each have their own objectives. Among these stakeholders, there are different teams that do not always communicate with each other, leading to a so-called silo structure. This may hamper the alignment of development projects in the organisation. Furthermore, different "IT" teams may have different maturity levels regarding Agile methods. This bimodality can lead to a more difficult internal alignment. This silo structure is particularly present in large organisations and administrations. Thus, the alignment between the different stakeholders and teams makes it difficult to implement Agile methods in the whole administration at scale. Indeed, the implementation of agile methods in large-scale methods creates new challenges.

TRANSITION TO AGILE

Another crucial requirement resides in the need for a strong driver in both the administration and the organisations towards agile methods. There are two main methods to make a transition to agile approaches: bottom-up and top-down. In the bottom-up approach, the willingness to change the development practices emerges from the operational development teams themselves. In this case, the main requirement for the organisation is to convince the leaders of the organisation and the overall administration to invest in long-term change and to adopt those new methods. Convincing them to do so is even more difficult due to the –often existing – leaders' lack of awareness about agile methods. In the top-down approach, the strategic leaders of administrations impose the

adoption of Agile practices to the developers. However, this sponsoring does not always lead to more concrete actions such as the hiring of agile specialists or support of pilot projects, as short-term objectives often drive the IT strategy in administrations and organisations.

These difficulties to find drivers for Agile methods raise the question of the innovation in the public sector: Who has the capacity and the responsibility to drive innovation in the products and services of the administrations?

IMPACT OF REGULATIONS

Administrations have to take into account the new regulations in their processes, including their development projects. These regulations impact the development practices and are sometimes conflictingwith agile methods. In the focus groups, participants stated that they were often waiting due to regulations, which led to delays. Furthermore, the impact of regulations on the e-government services are not subsidised but have to be integrated. For instance, if a contract was agreed upon before the implementation of a regulation, it will still be the reponsability of the development team to integrate the changes induced by this regulation.

The specific regulation about public procurement was the most cited as the main regulatory barrier. As, in public procurement, the planning and outputs of the development projects have to be fixed upfront, it makes it difficult to change the scope of the project afterwards. The low degreeflexibility allowed in public procurement procedures often comes in conflict with the high degree of flexibility for which agile practices stand. However, agile methods could also constitute a lead for solution as there are changes in priority during the development process due to new regulations.

HIERARCHICAL STRUCTURE

The federal administration and its organisations tend to function hierarchically. This top-down way of working is present within the administration as all major project advancements or resource requests have to pass through several official decision-making bodies ('Steering Committee', 'Working Group' etc.). This hierarchical approach can create tensionswith the transversality advocated for in agile methods. Furthermore, the notions of "iteration" and "scope flexibility" are not always well perceived by leaders in administrations, as they associate it with a loss of control on projects.

Furthermore, the top-down culture is influenced by political representatives who have an impact and influence on the functioning of the administration and organisations. Development teams see their work heavily influenced by politicians who require that projects are modified in such a way that they fit into their political agenda, often linked to the agenda of the elections, and less to the long-term developments in the organisation. This is however a recurring element within the public administration in general, and not so much a specific element of the federal administration alone.

RESOURCE MANAGEMENT

Belgian administrations saw their budgets decrease over the last years. However, at the same time, they were required to innovate and develop their online strategy. Among other consequences, this lack of resources in administrations led to the lack of internal competences as described in the first

requirement. When asked to do "more with less", administrations are reluctant to engage in agile methods as they are perceived as experiments with no clear pay-offs and cost-reduction. Furthermore, the up-front resource management, based on orders, makes it difficult to review the scope of the project as the financial aspects of a project strongly influence the project scope.

DOMAIN COMPLEXITY

The last requirement relates to the thematic domain complexity of the organisations. All have their own tasks and regulations, have diverse user bases, have to fulfil certain security requirements, need to deal with diverse project sizes etc. This complexity is in conflict with the notion of "time-boxed iteration", which is the practice of fixing the iteration end date and not allowing it to change, as most important requirements take time to be integrated in the software.

ENABLER 2: ORGANISATIONAL STRUCTURES

In the two focus groups on organisational structures, the team was able to detect a number of specific requirements for the management of current e-services, the development of future e-services and the collection and sharing of data. The requirements are in line with the analysed situation, and focus is put on the requirements of the federal administration as this is the target audience. It appearsfrom the analysis that there is apreference for the development of an organisational structure that combines both network and hierarchical instruments, allowing on the one hand sufficient freedom and leeway for the individual organisation, but at the same time also pushing the different federal organisations towards more cooperation via the agreement on a common vision and the installation of coordination networks or platforms, whereby it is expected that a single organisation takes up the role of authority and coordinator – holding as such the middle between a clear hierarchy and a network approach. Interestingly enough, the participants made no references to the potential use of market instruments in their policy making or in the development of organisational structures. Also the role of the private sector was only discussed to a very limited extent.

BALANCING A COMMON APPROACH AND ORGANISATIONAL INDEPENDENCE

As described above, the most important requirement from all participants was the need to strive for a balance between having a shared and commonly agreed vision and strategic approach for the development of a digital government[1], complemented with coordination between federal organisations to ensure a smooth exchange of, for example, data. At the same time, organisations demanded to be allowed to behave in an independent way to ensure flexibility in their actions, such as, for example, in the offering of e-services towards their end-users. It was made clear that a single dominant actor is, in comparison to other models used in other European countries or Belgian regions, not preferred and would undermine further cooperation between the different federal organisations. One organisation may 'frighten' the other federal organisations. Nevertheless, the participants refered to the importance of having a strong CIO (administrative function, and

[1] Such a vision and strategy should therefore not be highly specific, but at least define the key principles as well as a number of actions to be taken by both horizontal and vertical organizations in the federal administration. The aim is not only to develop a common digital policy approach, but also a common spirit on what a digital approach means for the federal administration.

administratively accountable) or Minister (political function, and politically accountable) which is capable of pushing forward the cooperation, by providing support and/or a general vision. This fuction has to pull and push when the other federal organisations do not move forward, by providing basic lines for a vision or by supporting the (other) federal organisations.
Currently the federal administration has the G-Cloud which has a Strategic Board and an Operations & Programme Board. It is mainly focused on projects and stimulates the sharing and re-use of digital products and services. The FPS BOSA is responsible for the development of a digital strategy. It was proposed to organise a slight reform in this structure, whereby the G-Cloud and the FPS BOSA would work together towards a vision and strategic approach. In this way, the ownership and involvement of the other federal organisations can be increased, while ensuring sufficient leadership via a single organisation, i.e. the FPS BOSA. Concerning the representation, it was underlined that the G-Cloud results in different IT managers knowing each other. However, not all organisations are represented in a direct way as (1) membership of the G-Cloud is not obligatory and (2) the G-Cloud functions with a model of indirect representation.

As mentioned above, the organisational independence is a crucial requirement for different federal organisations. As they make the investments themselves, they want to preserve the ownership of their actions. Especially important, in this respect, is the need for more flexibility in certain procedures, such as the procurement procedures for buying computers or software licenses etc. Only in this way organisations can develop projects on e-services in, for example, an agile way.

ORGANISATIONAL ASPECTS OF (GEOSPATIAL) DATA SHARING

SHARING PLATFORM FOR GEOSPATIAL DATA

Another requirement put forward by the participants is the increased re-use of (authoritative) data sources, which can then be shared via a 'sharing platform'. Such sharing platforms do already exist in the Belgian context in the form of 'data integrators'. Think thereby of the FPS BOSA, the Crossroads Bank for Social Security, or the Crossroads Bank for Enterprises. It was however underlined that the geospatial data sources transferred via the FPS BOSA, as service integrator, remains limited. Therefore, it was proposed to set-up a specific sharing platform for geospatial data sources, which could then also take the form of service integrator for geospatial data sources. However, it was at the same time underlined that this would lead to a duplication of efforts, as an extra service integrator would be created. This can be solved in two ways: By creating bridges between the different service integrators, to ensure that the data exchange between those actors is also increased, or by increasing the attention of the FPS BOSA as service integrator for geospatial data sources. Nevertheless, the need for more collaboration between the different service integrators – be it only at federal level or in relation to the regional level – was underlined. Furthermore, it would also reduce the efforts to be made by the orginal producers of the data. Very often, data producers have no difficulties with sharing the data with other interested public and private organisations or actors. However, they are only partially willing to invest extra resources in the sharing aspect as the added value of sharing data is not always clear to them and it is, according to them, mainly beneficial for the receiver of the data. Also, the manager of this sharing platform could set the sharing criteria, without bothering the original possessing organisation.

INCREASED ATTENTION FOR AUTHORITATIVE DATA SOURCES

Concerning the authoritative data sources, there seems to be a demand to increase the number of geospatial data sources that are authoritative. Those can then be shared via the sharing platform. By creating more authoritative data sources, a duplication of efforts can be avoided and different users can work on the same geospatial data sources. This leads to a simplification if data sources are later put again together. Four points were underlined in this respect. First of all, it was made clear that one of the main requirements for authoritative data is the clarification of who is the lead actor in the source management. This needs a clarification both at the level of the federal administration and often also within the organisation itself. Secondly, organisations often have difficulties in knowing or understanding how their data will be re-used by other actors. If a data source is qualified as authoritative data source, then of course it has to be first clarified how the different actors will re-use the data. Thirdly, participants underlined that the Belgian administrations at federal and regional level take different approaches for their authoritative data sources. Therefore it was suggested to work towards a common solution, which could for example include the recognition of authoritative data sources of one administration by another administration. Finally, the State Archives underlines that for conservation and archiving reasons it would also be highly interesting to increase the number of authoritative data sources, as it would clarify which data can be preserved for future generations.

STANDARDISATION AND THE IMPORTANCE OF A CLEARING HOUSE

In order to ensure that data can be re-used in a simple and flexible way, the participants suggested to standardise the data. Increased attention on data standardisation is seen as one of the main requirements according to the participants, but it was also clear that it is one of the most difficult tasks to deal with. Insufficient data standardisation was also considered as one of the main reasons why there is still such as strong barrier between geospatial and non-geospatial data sources. Important is the fact that the participants underlined that the data standardisation is seen as something that has to be tackled via a common approach, whereas the distribution (see above 'Sharing platform for geospatial data') and 'data cleaning' was suggested to happen via a single actor. For the data cleaning it was suggested to appoint a clea(r/n)inghouse which could both judge on topics such as data cleaning, statistical neutrality or privacy and security rules.

ADMINISTRATIVE REORGANISATION

One of the most far-reaching aspects that was touched upon during the focus groups was the possible reorganisation of the organisational structure related to geospatial data and functions. The team wishes however to underline that this element ~~however~~ was only introduced by one participant. It was proposed that a restructuring of the role of the National Geographic Institute might be beneficial, but that a broader organisational restructuring might be even more beneficial and far-reaching. Concretely it was suggested to set-up a new organisation which merges the current tasks of the NGI, the FPS Finance – specifically the department responsible for geometric services –, ~~Statistics Belgium~~ and potentially also other units or departments from scientific institutions such as the Royal Belgian Institute for Natural Sciences, the Royal Meteorological Service or the Royal Observatory of Belgium. Furthermore, it was underlined that a strong IT department would also be necessary in such an organisation.

This proposal would lead to a simplification and clarification of the organisational structures of the administration for the topic of geospatial data, but would at the same time require certain investements – especially before, during and right after the merging of those organisations and departments. Furthermore, it has to be underlined that there was, between the participants, disagreement on whether a new organisation should be created grouping the above describe organisations/departments or if those organisations/departments could become part of a strengthened NGI.

ADMINISTRATIVE SIMPLIFICATION: DEVELOPMENT OF A COMMON VISION

As described above, one of the main requirements is the creation of common and shared vision between the different federal stakeholders. Specifically, the focus groups pointed to a deeper need of administration simplification which currently blocks the flexibility and innovativeness of administrations, but which can only be solved via the creation of a common vision. As an example, the common vision of financial matters was given: Austerity. All actors within the federal administration agree that this "austerity vision" has to be accepted. It is a shared strategy to be followed by the federal administration. Such a shared vision is also necessary for the administration concerning the topic of digitalisation and simplification.

Specifically, references were made to the difficulty of working with so-called protocol agreements. Those agreements are used when data is shared between different federal organisations, and include the conditions on the use of data as well as the rights and obligations for the different organisations. Those agreements lead to an increased difficulty in the exchange of data, and have a negative effect on the re-use of it. It leads to an increased burden on the administration and demands higher resource investments as well – e.g. more budget and staff working on those agreements. Therefore, a simplified structure and extended implementation of the once only policy might be beneficial.

Furthermore, certain innovative actions and initiatives are blocked by strict financial rules or demand active time planning which lead to inflexible situations. An example is the buying of computers for an organisation. This can be done via a common procedure lead by the FPS Finance but requires the organisation to know exactly how many computers are needed at what moment in the year. This is seen by some organisations as a blocking factor in the development of a flexible working environment. Participants underlined that procurement should, at all time, be respected but, at the same time, made clear that more actions have to be taken to allow for a flexible working environment which does not block innovative solutions or approaches. A middle ground could be the inclusion of financial advisors in the development of innovative service developments, with support of the FPS Finance.

INTERNAL ORGANISATIONAL COORDINATION

Also, it is necessary to recognise that some organisations seem to miss the necessary exchange of information on ongoing contacts that the organisation has with external partners. It is a loss of capacity when one actor within an organisation, be it at a higher or equal level, is in negotiation with an organisation, when there is already another actor within the same organisation negotiating on the same topic with the same organisation. This kind of issue can however easily be avoided via correct

and open communication and exchange of information within one organisation.

LONGTERM POLITICAL SUPPORT FOR RESOURCES AND COORDINATION

When reffering to political support, the participants referred to two points. In the first place, it was mentioned several times that more political support is necessary for the liberation of sufficient resources for the less-visible but essential functions executed by an organisation, such as the geospatial and/or IT services in different federal organisations. Not only is it a matter of having sufficient financial resources, but also – and even more importantly according to some – it is about the presence of sufficient staff in the organisation that can lead the projects related to geospatial data and/or e-services. Often, temporary external actors, such as consultants, are asked to deliver a certain service for an organisation, but once the service is delivered, the consultants leave and the knowledge is partially lost. Participants however felt the need for more political support on this, as it is partially a political choice to work more with external actors than internal civil servants.

Secondly, concerning the coordination, it was underlined that some of the federal public services and some of the social security organisations, have a high level of independence, and will only be prepared to collaborate with each other to a certain extent. Political steering appears therefore, according to the participants, to be a prerequisite to foster the cooperation between the different federal organisations. It has to be underlined that one of the participants pointed to the instability of the Belgian state structure: There is always the possibility that one of the organisations or part of the organisations is regionalised, which can partially undermine the willingness to set-up collaborations with other federal organisations.

RELATION BETWEEN FEDERAL ADMINISTRATION AND THE OTHER REGIONAL ADMINISTRATIONS

It was underlined that the relation between the regions and the federal administration is complex and challenging, and therefore requires an approach that goes further than the current network collaboration that exists between the different Belgian administrations. The fact that the regions, language communities and the federal level are all equal is seen as a problematic aspects blocking further cooperation between the administrations. Therefore it was proposed that for some policy aspects, where the national interest dominates the regional interest, it should be possible for the federal administration and government to intervene. Examples such as Germany and Switzerland were named by the participants. Furthermore, it was emphasised that the ongoing regionalisation of policy domains creates more and more complexity as one federal organisation is split in three to four administrations and still requires an exchange of information between them. Once more this intensifies the already existing coordination issues. Although the installation of a certain level of hierarchy between the regional entities and the federal level was put forward as a requirement, the team emphasis that this is something that cannot be dealt with in the scope of this project. The realisation that there are certain issues with the Belgian federal model is not new, and will always require a political solution that goes further than the scope of the project.

ENABLER 3: SERVICE INFRASTRUCTURE AND APPLICATIONS

In this focus group, the main topic that was discussed was the necessity to develop an end-to-end enterprise architecture in order to implement successfully the e-government strategy. Enterprise

architecture applies architecture principles and practices to guide organisations through the business, information, process, and technology changes necessary to execute their strategies and apply changes. There are several requirements that are essential according to the participants to reach the ability to develop and execute the delivery of valued services to citizens and companies in an efficient way.

CAPABILITY TO INNOVATE

Applying new technologies within governments gives rise to a number of difficulties. First, there is the adoption rate, which we define as the rate at which entities adopt new technologies and innovate. The adoption goes slower in administrations due to several factors. Administrative inertia leads to innovators being held back in their innovation by other actors who resist to change. Furthermore, the fear of change is also seen as a factor as there is a fear of the unknown and/or a fear of losing jobs due to the digitalization. Indeed, there is currently a little/insufficient understanding that the digital innovations will transform jobs but will not delete them. Lastly, there is a lack of financial and non-financial incentives to innovate. The particular case and use of artificial intelligence technologies was discussed as particularly slow in administrations due to the pre-cited factors.

Second, the information architecture is complex in the context of administrations. We define information architecture as the structural design of shared information environments that support government entities in their task execution. This sharing is sometimes implemented through data networks that are shared by several entities in order to enhance co-working. This is a result of the once-only principle, according to which the federal organizations ask citizens' information only once, and then re-use and share this information when other public sector require the same information for the fulfilment of their public tasks. Another lead for information sharing resides in a 'Hub structure'. This structure is made of modular building blocks, which we define as an architecture made of losely coupled blocks that can easily be changed, following EU's best practices. Lastly, the use of common and shared standards and formats is also perceived as key in order to enhance data sharing.

The organisational architecture is also a requirement to be tackled to implement the enterprise architecture. There is indeed a need to enhance the end-to-end thinking in the delivery of e-services. However, this end-to-end delivery and adoption of new innovative technologies is dependent on the behavior and goodwill of organisations and/or sub-entities. This collaboration is not always possible as the actor responsible for the entire process cycle, might not always be caple and/or willing to ensure effective collaboration, due to forced intergovernmental collaboration, silo structures (fragmented government entities who lack covering leadership and responsibilities to transcend barriers), or competition between different entities. A negative consequence of this lack of integrative organisational architecture is the replication of services and a loss of resources.

PRIVACY

Another crucial aspect that was discussed as a main requirement to implement the enterprise architecture was the attention to privacy when developing the service infrastructure. The main requirement here is to avoid privacy violations. Privacy can be guaranteed by developing certain habits and customs such as the "privacy-by-design" approach. In such an approach, the development of applications is performed in such a way that privacy is automatically safeguarded. The importance

of citizens' perception on privacy is also seen as crucial by the participants. Indeed, governments have an exemplary role to play in the respect for privacy and the perceived image towards the respect for privacy. Currently, citizens attention is increasingly drawn towards the respect for their private data, as a results of recent legislative action (EU General Data Protection Regulation and its implementation) and the consequential media attention. Furthermore, on a more negative side, there have been a number of global scandals regarding personal data related to the social media company 'Facebook' and the (possible) influence of personal data misuse in Western democracies.

USER-CENTRICITY

The last main requirement that needs to be addressed when developing the service infrastructure is the user-centricity and the need to focus on the user/citizen to give a 'better' experience. Citizens and businesses are expecting more individualised, timely, and correct services from administrations due to the habit of using private e-services. Indeed, their expectations are rising. One of the citizens' expectations is the governmental use of social media and being available 24/7. However, when developing the service infrastructure, a particular attention has to be set on the Digital divide, which is the gap between different layers of the population due to technological inequality. The main lead for solution to tackle this requirement is to integrate the user in the development. This can thus be linked to the "Processes" enabler discussed above. Indeed, participants stated that there is a need to take the User experience into account and to thus design User-friendly application.

ENABLER 4: PEOPLE, SKILLS AND COMPETENCIES

For this COBIT enabler, three requirements have been identified, namely: "Digital divide among citizens", "Public sector attractiveness" and "Lack of financial resources". Among these three requirements, it was decided to focus more deeply on the "Public sector attractiveness", as the team feels that this is where it can be the most influencial.

DIGITAL DIVIDE AMONG CITIZENS

This requirement, in line with the above discussed requirement on user-centricity, relates to the necessity for administrations to cope with the digital divide among citizens. More precisely, they should be aware that if a large part of the population awaits from them to be innovative and to follow the wave of the new technologies, some citizens prefer to function the "old way" and to have personal contacts via visits to the administration. Moreover, a performant digital infrastructure is not everywhere and at any time available. As such, the paradigm of digital-by-default is a nice slogan, but it should be ensured that citizens and businesses keep the opportunity to access services offered by the administrations through other channels as well.

Nobody should be left on the side of the road as a consequence of an all-and-only digital strategy. This is recognised by both administrations and politicians at different governmental levels, including the federal level. It is, however, known that administrations try to increase the use of their e-services by citizens and businesses by facilitating the access to e-services, by increasing the complexity of non-digital services or by decreasing the challenges for a digital demand. An example of such an action is the online tax form offered by the FPS Finance. Part of the form is already prefilled in the online form, delivers extra online services such as optimisation and a provisional calculation of the

tax assessment and can be handed in later, whereas the offline tax form remains highly complex to use and must be handed in one month earlier.
Furthermore, the team found that the digital divide is not only a material problem pointing to users that are unable to use digital tools. There is a group of citizens which are able to use digital tools, such as social media, e-commerce and online banking, but which do not use the digital options provided by the administrations. This problem is also acknowledged by the European Commission in its Annual eGovernment Benchmarking Reports of 2016 and 2017 as one of the main challenges for the Belgian administrations. Belgium is a country where there is, on average, a high level of education and economic wealth, but the use of public e-services and the overall digital penetration rate remains overall rather low.

Another element related to this digital divide among citizens is the digital divide within the administrations. The degree of digitalisation varies strongly from one organisation to another, and within one organisation there can be strong differences between different staff members. Also between different administrative levels there is a difference, often related to the overall investments made by the administration in the digital skills of its civil servants and employees.

PUBLIC SECTOR ATTRACTIVENESS

This requirement relates to the fact that it is complicated for the public sector to compete with the private sector when it comes to attracting specific strongly demanded profiles, such as IT and data science specialists. Indeed, the public sector is rarely able to offer as interesting extra-legal advantages as the private sector and seems to suffer from a negative image. The impression exists that there are not enough innovative projects to work on compared to the private sector. This can lead to unfortunate situations where administrations are unable to rollout their e-service projects, due to a lack of sufficiently skilled personnel.

DIFFICULTY TO ATTRACT SPECIFIC PROFILES

As stated above, the fact that the administrations have difficulties recruiting and keeping specific profiles is a reality, though, apparently, and according to the respondents it is easier to find specific profiles in Wallonia rather than in Flanders. It should also be stated that this difficulty is not limited to ICT profiles, but also applies to other specific profiles, such as technical profiles, medical profiles, paramedical profiles, financial profiles, legal profiles, economical profiles, or surveyors. Nevertheless, it seems that public sector attractiveness is less of an issue when it comes to attracting young people who just finished their studies. For them, the public sector is actually quite competitive, as the salary for a starter is competitive with private sector salaries, there is a good work-family balance, and they directly have the full amount of legal holidays. There are also new tendencies with young people finishing their studies. For example, some of the younger people care less about having a company car, so the public sector can be competitive by offering them their public transport subscription (train, metro, bus, tram).

CAUSES OF THE RECRUITMENT DIFFICULTIES

1) **Not the lack of people applying, but rather the lack of people who decide to take the job**

What is important to note, it that the recruitment difficulty is not so much linked to the number of

people who apply, but rather to the number of people who pass the test, and even more so, to the number of people who decide to take the job. This is a quite new phenomenon. Also, there is a "market vision". People apply to several job offers and then pick depending on what suits them best. Even if they signed an indeterminate length contract (CDI), they keep looking if they can find something better elsewhere. This applies to both the private and the public sector. People are much more mobile nowadays.

2) **Lack of clear political vision, which creates a lack of stability regarding the projects that the civil servants work on**

When candidates ask questions about the long term vision of the organisation, recruiters often have to tell them that there are a lot of uncertainties. Formerly, people looked for career stability in the public sector. Now, they also look for a stability in the project that they join, and they want to know that they will work on it with the same team until the end. So even if there still is a stability in working for the public sector, the uncertainty is much greater regarding the concrete projects that they will work on.

3) **Administrative heaviness of the recruitment procedure and lack of flexibility**

The participants underlined the administrative heaviness of the recruitment procedure. Clearly, it is important to remember the origin of this heavy procedure, namely to fight against abuses and provide equal access to public functions to everyone. Indeed, this procedure is positive in the sense that everyone has to follow it, and the positions are no longer given arbitrarily. Nevertheless, this burdensome procedure creates difficulties, in comparison with the private sector that is more flexible and efficient in the recruitment process. The recruiters only have a certain degree of flexibility.

SUB-REQUIREMENTS FOR ATTRACTING IT PROFILES

1) **More flexibility (in terms of diploma requirements, salaries, length of contracts, selection procedures)**

In order to facilitate the attraction of IT profiles, more internal flexibility is required. This flexibility should materialise in different forms. Firstly, more flexibility is needed in terms of diploma requirements. The participants indicated that it would be good if it is possible to recruit people with a lower degree than the one required if the candidate already has some kind of relevant expertise for the position. At the federal level, they have that type of flexibility, but it requires a specific procedure. This flexibility is desired as a matter of principle, and should not be depending on a specific procedure. Secondly, there is a need for flexibility in terms of salaries. Currently however the salaries are scaled and it is hard to derive from this. It is almost impossible to reward someone who works well in comparison with someone who does not. It is also extremely difficult to fire someone who does not do his/her job correctly. It should be possible to adapt the salary depending on the profile, the market and the evolution of the situation. Right now, every modification takes too much time. Rather than fixed salaries, the regulations should set a framework within which administrations have to operate, but where much more flexibility is given to each administration. Nevertheless, there is at the federal level for specific profiles such as IT specialists already some kind of salary flexibility, as people with a bachelor degree can be paid the salary of someone with a master's degree. To give an example, one participant mentionned that, at the FPS Finances, they offer a bachelor IT specialist with no experience 3000€/month (pre-tax). In the private sector, it is often 2500€/month (pre-tax). For college degrees, it is 3600€/month (pre-tax). At the end of their career, it is 6100€/month (pre-tax). In the private

sector, they end with 5000 or 5500€/month (pre-tax). So for these specific profiles, the salary was ugraded. Therefore, IT bachelors get the salary that university students generally get for other jobs in the public sector. This type of flexibility should be generalised, to be able to attract all types of specific profiles, and not just IT profiles.

Thirdly, flexibility is needed in terms of contact length. This has to do with an efficient use of resources. Indeed, for an extremely specific profile, such as an IT architect, it might not be necessary to hire that person long-term, but rather for a shorter six month period. It might not be necessary to hire the person for the whole length of the project, but solely at the beginning.

2) More communication about all the innovative projects done in the public sector is needed (informing students, having more student internships, re-branding and dusting off the traditional negative image of the public sector)

There is a great need to communicate externally regarding what the public sector can offer, in order to dust off the traditional negative image of the public sector. The administrations do not communicate enough on the recent evolutions and projects, nor about the interesting jobs that are offered. They should engage in re-branding policies. Administrations should also ensure that the civil servants are satisfied with their working conditions and environment. Indeed, people's opinion about their work is important, as they will talk about it around them, whether positively or negatively, and this has an impact on the administration's image.

Many candidates tell the recruiters that they do not sufficiently put forward everything that they offer, that they want to do, and all the interesting projects that they have already done. This is a missed-chance, and it probably explains why certain people do not apply, as they are not aware of all the existing innovative projects. There is a clear advertising problem. This is all the more true that the public sector is even sometimes further in the innovation than the private sector, but they have difficulties to express it.

This is also linked to the fact that graduating students are not always aware of all jobs types available in the public sector. According to the focus group's participants, students tend to think that there are only administrative office jobs, so they are not interested and do not even look at the job offers. Surely, some civil servants and administrations attend job fairs, but administrations are urgued to invest much more in internships. There is a real need to target younger people, and be more visible to them. More traineeships can also be offered to students, so that they can discover the public sector during their studies. It is key to attract them at a moment where the public sector can be higly competitive with the private sector. Indeed, people who have several offers might be more attracted by the public sector if they already worked, during their studies, on innovative projects in the public sector. Accordingly, synergies with high schools and universities can be developed to give specific classes. It is a win-win situation, as the high schools and universities provide their students with specific classes on the governmental topics, and the administrations can valorise their image. This allows breaking the wall between the reality and people's perception of the public sector.

3) Having a clear political vision

There is a need for a clear political vision. Administrations need to know where they are going. They are bound to changing political deciders, and they should receive their "vision" much faster. Often, when there is a change of Government and/or Ministerial cabinet, the administrations know that

things are going to change but they do not always know what will change nor which orientation will be taken.

4) Convincing the management to modernise their departments

A fundamental requirement for increasing public sector attractiveness is convincing the administrations' and departments' management to modernise their way of working. Having a manager with a clear vision when it comes to projects is extremely important. If the manager has excellent knowledge about the stakes, and if he sets clear norms on the medium to long term, this common vision will carry people and everybody will follow. Candidates will be more attracted to the public sector if they are aware that a clear vision is being followed, and that the former extremely hierarchical way of working has been replaced by "new ways of working".

DIFFICULTY TO KEEP SPECIFIC PEOPLE IN THE ADMINISTRATION

Not only is it difficult to attract people to come work for the public sector, but it is also extremely difficult to keep specific profiles within the administrations. Indeed, there is much more volatility today. People do not necessarily stay their whole career in an administration or the public sector as a whole. Before, people used to start a civil servant career and stay their whole life within the public sector, but this is no longer systematically the case. For instance, IT specialist do not really care about the job stability aspect of a position in the public sector, as they know that they will easily find another job. For them, the concrete function and mission that they will conduct is much more relevant.

CAUSES OF THE DIFFICULTY TO KEEP PEOPLE IN THE ADMINISTRATION

1) Loss of purpose because of the digitalisation

For many civil servants, working for the common good remains the main motivation today, together with the job stability and a good work-family balance. This is especially true for people who worked in the private sector before, and who are tired of the commercial productivity goals that affect the quality of the output. However, because of the digitalisation of the public sector, some civil servants no longer feel like they are working for the common good. Indeed, nowadays the distance between the administrations and the users/citizens is bigger, as everything is becoming more and more digitalised. Accordingly, some civil servants resist to this change, as they originally came to serve the population but now only face a software that helps the population. So this distance creates a "loss of purpose" for some civil servants, who do not feel like they are helping people. This changes the civil servant's relationship with its organisation, as he/she feels that the organisation no longer reflects the values that he wanted to work for.

2) The "new way of working", e.g. "Home-working", has as effect that people do not feel personally involved in their job

All the "new ways of working" initiatives created in the organisations, in order to modernise them, have many positive aspects. For instance, it offers more flexibility to the civil servants. Nevertheless, they can also have a negative impact, as some civil servants might not feel personally involved and might lose the feeling of belonging to an organisation. For example, at the FPS Social Security, staff can work from home 3 days a week, so they are only at the office 2 days a week. Therefore, there is less exchange with the colleagues and this impacts the involvement in the organisation. Moreover, in

FPSs where people work with "Flex-desks", the civil servants often end-up grouping themselves in the same areas, and the French speaking and Dutch speaking people do not sit together. The social aspect of coming to work to see colleagues decreases because of this homeworking ability. Finally, some people also refuse "home-working". They do not want to use a smartphone or read emails at home, and want a separation between home and their work, as indeed, home-working can blur this line.

3) Lack of appropriate work environment

In the past, some IT specialists did not have the necessary hardware and desks to welcome new staff, and some had to wait several weeks before being able to start to work. If the work environment does not meet the expectations of the newly recruited staff, there is a higher chance that they will leave quicker than the average staff does. If the work environment is not sufficiently good, these people will leave quickly. That is why Selor tries to have a modern building for their recruitment processes, but then some people end up working in buildings that are quite old and gloomy. This discrepancy can also have an impact on their willingness to stay in the public sector down the road. Hence, an appropriate work environment is required.

4) Lack of innovative management and traditional culture resisting to change

The management of a specific department is also extremely important when it comes to convincing people to stay. It can be a real barrier when it comes to keeping people in some departments, especially when the culture is strongly hierarchical. Changing the culture is the most difficult. People now have to work in a completely different culture, and that can frighten them. In larger organisations, such as the Public Service of Wallonia (SPW), there can be a very strong heritage culture. There is a will, from the General Secretary, to modernise the SPW, but it will take time. The strong role that the trade unions have in this organisation, and their strong resistance to change, is one of the complicating factors in that regard. This could end up being a real barrier towards modernising the SPW. Even if there are a lot of ideas, it is extremely complicated to pursue them in practice. That explains why the SPW has major difficulties in keeping people, even if they managed to recruit them. Indeed, when the civil servants face disappointments because they proposed innovative ideas that were not followed-up, they hit a wall and the chance that they will leave the organization increases.

5) Lack of clear political vision, which creates a lack of stability regarding the projects that the civil servants work on

The lack of political vision not only affects the public sector when it comes to recruiting people, but also when it comes to keeping these people in the administration. Given the current budget cuts, some civil servants fear that nobody will want to work for the public sector anymore, as the advantages, including in terms of retirement plans, are taken away bit by bit. Administrations do not know what the political deciders expect from the future of the administrations.

SUB-REQUIREMENTS FOR KEEPING IT PROFILES IN THE ADMINISTRATION

1) Focus more on "continuous training" and on re-orientation

An advantage in the public sector is the "continuous training policies". Indeed, the administrations can offer IT specialists a five-year vision on where their career is going. This is not the case in the private sector, where the support in terms of career is much weaker. Therefore, the administrations should really push for these kinds of initatives. Of course, this is not without risks, as it could be that

some trained civil servants will then sell themselves better in the private sector afterwards.

2) Gain the loyalty of the subcontractors

Quite often, the administrations resort to external consultants to conduct IT projects for them. In some cases, it might become more interesting from a financial point of view to hire these consultants internally, rather than to keep resorting to subcontracting. The FPS Finances happened to be in such a situation, and when they asked some of those external consultants to work directly for them, they had a lot of positive responses, because they had gained their loyalty over the years. So resorting to subcontracting, in a first phase, in order to gain the subcontractors loyalty, is a good way to attract these profiles internally in a second phase.

3) Creating a trust relationship between the management and the civil servants

A trust relationship is key. Provided that the function allows it, it should not matter when and where the civil servants work, as long as the results are there. However, it is very difficult for the managers to define these objectives and to be able to evaluate these objectives. Once again, this shows that flexibility is essential.

This is maybe why some managers do not want to adopt this way of working, as they are scared that, if they let their team work from home, they might abuse it and not work sufficiently. Indeed, there are abuses, and it is not obvious, for all functions, to measure the objectives and to evaluate them. It is much easier for a manager to check whether someone is there or not, on time or not. But now, the reflection is deeper, as they have to evaluate whether the objectives are met. And that is not easy for managers that have to combine this with their own work. Indeed, setting the goals, the indicators, and taking the time to organise evaluation meetings requires a high amount of resources.

Moreover, some people need a manager that gives a lot of guidance and orders, as they are really not comfortable with a "result" approach where they do not feel sufficiently followed and supervised in their daily work.

LACK OF FINANCIAL RESOURCES[2]

This requirement relates to the budgetary shortcomings that hamper the development of e-services. A clear example is the former FPS FEDICT. The organisation witnessed an overall decrease of its budget due to the budgetary shortcomings of the federal government. This led to a situation in which it became highly difficult for the FPS to innovate and develop new tools, and created a 'survival situation'. Furthermore, the federal government wants the overall ICT budget to decrease. Although this can indeed lead to an increased level of cooperation between organisations – the G-Cloud is a clear example of this – it should be underlined that reducing the budget for ICT, on the one hand, and proclaiming the development of new ICT tools, on the other hand, is incompatible. A decrease of the budget leads to less investments, while the overall objective of increasing greater efficiency via digitalisation is expensive – especially in the first years, both because of the innovation aspect and

[2] It has to mentioned in this regard that this is highly depend on the political situation and support and the funds allocated to e-government developments. Also, interesting in this regard is the announcement by the European Commission to invest 9.2 billion EUR (period 2021-2027) in the future digitalization of the European Union, its adminstrations and the societies.

the knowledge that projects can fail.

ENABLER 5: CULTURE, ETHICS AND BEHAVIOUR

For this enabler, the team identified a number of requirements both for the federal level as well as for the organisational level. Within the organisational level, a distinction can than be further made for (1) the overall culture within the organisation and (2) the culture and way of working during projects. It is important to note that the culture enabler is not limited to 'digitalisation'. Digitalisation is not a self-standing topic, and it fits in a broader context of modernising the federal administration, its organisations and the way in which civil servants work for and with each other. Furthermore, time is a crucial factor at all levels, be it a federal, organisational or project level. Culture touches on the fundament of the organisation: It defines the public values that the organisation is striving for and which bounds together the organisation. The participants underlined in this respect that there is often still a discrepancy between the staff and the top and middle management – although this gap should not be exaggerated. Changing the culture, ethics and behavior takes time and efforts. It is a resource intensive activity, and requires ongoing support of the leading actors at federal, organisational or project level as well the Human Resources actor. The fact that is so time consuming can however lead to a lack of attention and/or willingness to invest in it.

THE OVERALL FEDERAL ADMINISTRATION

Concerning the overall federal administration, it was made clear to the team that the organisations are among the oldest and biggest organisations of the country. They all have their own legacy, with specific ways of working and specific cultural aspects. This makes it highly complex to change the culture, the ethics or the behavior of the civil servants working in those organisations. Furthermore – and it has to be underlined that this is a perception of the different participants of the focus groups – there is a lack of common federal culture. Overall, civil servants do not, according to the participants, share a common 'federal culture'. Rather they feel connected and part of their federal organisation. This should not come as a surprise, as federal civil servants often work within their own organisation without having strong connections to other organisations, leading to a closer connection to their own organisation than to the broader federal administration. But of course, one does influence the other. If one focuses mainly on their own organisation, then it becomes more difficult to feel part of the broader federal administration. This might however lead to less action taken to be involved in cross-organisational activities. This factors can thus lead to an intensification of a possibly already existing silo culture. So, the establishment of a more intense and common approach and vision is a first requirement.

REQUIREMENTS AT THE ORGANISATIONAL LEVEL

Concerning the organisational level, the team has been able to draw a number of conclusions on the requirements. First of all, the participants underlined that, although almost all federal organisations have a vision on their functioning and task, there is a need to ensure that the staff feels part of the vision and vice versa. Therefore, it is important that the staff is involved in the preparations of the vision – of course thereby respecting the position of the top management – but also that the vision and the decision taken on the vision are explained to the staff. Futhermore – and this is a difficult step for the administrations due to budget and staff resource limitations – it is necessary to ensure that the vision is also translated in the individual task agreements and evaluations that exist with each staff

member. Of course, the deeper one goes in the organisation, the more difficult it becomes to translate this vision into concrete actions for the staff member. This is one of the key limitations in finding a balance between the need of the individual staff member to be involved and the broader organisational policy approach that is taken.

Besides involving staff members in the vision of the organisation, an organisational cultural development plan can also help the other organisations on how to deal with culture, and changing a culture. It can, for example, include actions to be taken on the behavior of staff members: Not all of them have the required digital skills (see also the above discussed enabler 'People, skills and competencies'). It is possible to include in such a cultural development plan a part on the inclusion of staff members lacking the necessary digital skills via a number of specific actions, such as buddy approaches, online basic courses, printed manuals etc. Of course there also has to be attention for other staff members who wish to broaden their digital competencies or who wish to undertake innovative actions. Of course however, as a digital culture is not self-standing, it is important to ensure that an all-encompassing view on cultural change is developed or is, at least, kept in mind. So, the development of a concrete change management approach at organizational level is required, as well as guidelines from a horitontal and/or central body.

MOTIVATION AND RESPONSIBILITY OF CIVIL SERVANTS

Both for the organisational and project level, it became clear that it is necessary to find a balance between, on the one hand, the need to ensure sufficient ownership and involvement in the creation of a common vision, a new e-service, the redrawing of procedures, new ways of working etc. Apperently it is not always easy for organisations to ensure that their civil servants feel closely connected to the overall tasks and duties of the organisation. At the same time, it was also underlined that civil servants have a certain responsibility towards their organisation and sometimes need to take a more proactive position within their team, department or organisation. For example, when a new approach is launched by the organisation to involve the staff more, then it is important that civil servants take the responsibility to participate in it.

This is of course connected to the role of the top and middle management, as it is their task to provide guidance and show leadership, while involving their staff. In this way, by developing a two-sided approach in which both top and middle management, as well the rest of the staff is involved, a higher involvement and motivation can be created, possibily leading to an increase of the so-called 'job proudness'.

RESISTANCE TO CHANGE

In line with what the team already noticed before, the participants underlined that there is resistance to change within the administration. However, the degree to which this resistance is present varies, and influences the introduction of changes in the administration. Indeed, actions and activities can be taken to ensure that this level of resistance decreases.

REQUIREMENTS AT THE PROJECT LEVEL

When developing a new project, it is important, according to the participants, to develop not only the

technical and organisational approach, but also a cultural approach. This cultural approach is best developed already in advance of the project, but then needs to be followed and implemented during the technical implementation of the project and also after the project has been implemented. In this way, the civil servants are guided throughout the whole project, and the resistance to change is tackled as well. It can also create a stronger sense on involvement and responsibility, as well as more ownership. So, this requirement can be defined as the need to developed a cultural aspect for new projects.

ENABLER 6: PRINCIPLES, POLICIES AND FRAMEWORKS

DIVERGENCES OF OPINION ON OPEN DATA POLICIES

It results from WP 2 that the issue regarding Open Data is not so much the administration's unwillingness to share data, but rather the lack of financial means to do so. Also, the questionnaire results presented in the WP 2 Report show that public sector information should be (freely) available for re-use. Moreover, there are no major discrepancies between levels on this topic.

The financial implications of the implementation of a sound and comprehensive Open Data environment are indeed non-negligeable. For some organisations, it would be devastating to open-up their data freely as they currently rely on the sale of such data to fund themselves (as their functioning is not 100% financed by tax collection). However, this fear should not be exacerbated, as the PSI Directive[3], which provides that public sector information "*shall be re-usable for commercial or non-commercial purposes*" (Art.3), specifies that the principle of the limitation of the fee, that can be asked by the administration to the re-user, to the marginal costs incurred for the reproduction, provision and dissemination, does not apply when the public sector body concerned is required to generate sufficient revenue to cover a substantial part of the costs relating to their collection, production, reproduction and dissemination (Art. 6.2.b.). Indeed, in such a case, the public administrations can claim a reasonable return on investment for the sharing (Art. 6.2.c.).

Moreover, there is a need for a sustainable funding in order to ensure the quality, the continuity and the maintenance of this data, once it has been opened, which is often under-estimated by the political actors. This can be linked to the fear of the administrations to be potentially held liable in case of an issue with data that they would have shared. Nevertheless, some interviewed federal respondents made clear that making all location-based data 'Open' and compensating the responsible organisation for the loss in income, would only have a very small yearly impact on the overall federal budget, and that political support is difficult to find.

CAUSES FOR THE ADMINISTRATIONS' RELUCTANCE TOWARDS OPEN DATA

1) Potential lack of a clear definition of Open Data

The focus groups started with a debate about what is covered by the concept of Open Data as a common understanding of this concept is required. One suggested definition was that Open Data are

[3] Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information.

public sector data that are technically and legally open. Legally open means that there are licences that allow the commercial and non-commercial re-use without too many limitations. Technically open relates to the re-usable format and the fact that it is accessible online. Another suggested definition was that it consists in making datasets, created by the public sector, available for commercial or non-commercial re-use. It was underlined that there is an issue about how to define "public sector", which has an influence on who should open the data. It was added that for data to be opened for re-use, and to thus fall in the scope of Open Data, two requirements should be met, namely a technical and a legal requirement. Indeed, the data must meet certain technical standards in order to be re-usable, and, from a legal perspective, the datasets can only be opened if they do not contain personal data. Another limit to the definition of Open Data is that some datasets have a legal value, for example cadastral information. Accordingly, for this data, a problem appears if you allow its re-use, as you then risk to affect this legal value. In those cases, third parties are allowed to access the data, but not to disseminate the data. Therefore, if someone else asks for access to the dataset with legal value, these third parties must refer this person/company to the original public administration. Finally, it was mentioned that Open Data also covers the exchange of information between various public sector administrations. Access to data for other administrations is also fundamental. In order to ensure this, standards for the exchange of information are required. Thanks to Open Data, administrations could share their quality data among them and break the current – but already diminished – silo way of working.

According to some participants, a distinction should be made between the re-use, on the one hand, and the exchange of data between public services for public missions, on the other hand. Certain types of information can be exchanged between administrations but not opened for re-use. However, data that is open for re-use should also be open for exchange with other administrations, not only within the same level of power but also between different levels of power. In this regard, it is indicated in the Flemish transposition of the PSI Directive[4] that datasets that must be opened for commercial and non-commercial re-use should also be opened for the exchange of information between the administrations for their public missions. This is interesting as this obligation is not covered in the PSI Directive, and is a voluntary addition.

2) Classic misconception: Open Data is not necessarily Free Data

According to the participants, public sector data re-use should not always be free of charge. Indeed, some administrations are currently selling parts of their data, in order to stay competitive as this represents a substantial part of their budget. The financial loss for them would be problematic if they had to make this data available for free, and it might affect their viability. It was then specified that, even in the PSI Directive[5], Open Data does not always have to be free and the administrations can ask for a fee, the amount of which can vary depending on the way the administrations are financed (e.g. do they get their budget completely from tax-payer money or does a part of their budget derive from services or products that they sell). Indeed, in the latter situation, the PSI Directive allows them to ask for a fee to use the opened data, which is set in such a way that these administrations can get a reasonable return on investment.

[4] Decreet van 12 juni 2015 tot wijziging van het decreet van 27 april 2007 betreffende het hergebruik van overheidsinformatie en het decreet van 18 juli 2008 betreffende het elektronische bestuurlijke gegevensverkeer.

[5] Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information.

3) Tension between the public mission and the building of commercial services

The difficulty for the administrations is that their goal is to fulfil a public sector mission, but that this mission generates public sector information that can be highly valuable for potential re-users. Therefore, it can be frustrating for the administrations to see that private sector actors make profit out of the data that was generated for public sector missions. If one looks at the global picture, it is a win-win situation. However, for some administrations, this win-win situation might not be that clear, for example if they have to open a lot of data, which is costly for them, but they only get a small chunk of the tax benefits resulting from the re-use in return. This win-win situation is even less clear for administrations that are not funded at a 100% from tax money and state. This can lead to frustration towards Open Data.

Yet, for some civil servants, this frustration has nothing to do with the money but rather with the idea of Open Data itself: "Why do we have to open the data?"; "Why is it necessary?"; "Why is it important?". In this regard, it was underlined that there is not enough information and awareness raising about the benefits of Open Data. This is linked to the fact that some administrations want to keep the data for themselves and remain in control. Unless there is a change in the culture of the administrations, there will always be frustration about Open Data. Some are of the opinion that this frustration is indeed only about the money, and that the culture is not a problem here. This is especially so for the administrations working closely with the science field, as they are used to having their data re-used by researchers.

4) Some administrations wish that there would be a viral effect of openness

Some administrations think that there should be a form of "viral effect" of the openness. Indeed, the fact that there is no "return" from the private sector does not encourage them to invest in Open Data. In this regard, the discussions around the notion of "Reverse-PSI" are relevant. This notion describes a situation in which private sector companies, who have datasets that could be of "public interest", would be compelled to share those datasets with the administrations that require them. Indeed, due to the privatisation of the public sector, some private sector companies have valuable information. For example, in the coming years, the last mile of many key infrastructure networks (for the distribution of gaz, electricity, water, etc) will be more and more privatised, and this last mile information is fundamental for the emergency services. It should be pointed out that, in the review of the 2013 PSI Directive launched end-2017 by the EU Commission, one of the proposals was to include this "Reverse-PSI" obligation in the PSI Directive for datasets of "public interest". Unfortunately, though 88% of the respondants to this public consultation indicated that they were in favor of such a modification, the Commission has decided not to include such a "Reverse-PSI" obligation in the legislative proposal amending the PSI Directive.

5) Several administrations do not see what their data could be re-used for

All of the administrations have data, but some do not know what it can be used for. There is a problem of awareness for those producing and those re-using the data.

6) Tension between the PSI Directive and the *sui generis* database right

There is legal uncertainty around the articulation of the PSI Directive and the Directive on Database protection[6]. Indeed, there are currently no public sector licences for databases (such as ODBL), while

[6] Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases.

these databases are protected by a *sui generis* right. This is important because if there are no licences, the public administration could try to rely on the *sui generis* protection of databases, which prevents the extraction and the reproduction of a substantial part, defined quantitatively or qualitatively, of their database. So there is a tension between the PSI Directive and the *sui generis* protection and this lead to legal cases in France, where the Cour the Cassation indicated that the State archives cannot rely on the *sui generis* database right to refuse the re-use of information requested through the French transposition of the PSI Directive.

7) Tension between Open data and Data protection

There is also legal uncertainty around the articulation between Open Data and Data protection. Indeed, the GDPR[7] is often perceived as not being in favour of Open Data, and the administrations do not want to take the risk to share personal data, in order to be GDPR compliant.

It appears that this is sometimes used as an "easy excuse" to deny access to specific datasets, but the real problem is that the civil servants working in the administrations do not receive sufficient information about the articulation between the two legal instruments. There is a gap between the information that they receive and their concrete daily activities. This information is not adapted to their specific questions and needs.

SUB-REQUIREMENTS IN ORDER FOR ADMINISTRATIONS TO ENGAGE MORE WITH OPEN DATA

1) Think about shifting to a "Service providing" mentality

For some administrations, it might be valuable to enter into a "service providing" mentality, which is not currently in their culture. In that sense, Open Data could be seen as a mean to evolve towards such service oriented mentality, in order to give added value to the citizens. This is the chance for the administrations to re-invent themselves, and to give themselves the means to create good quality data that can then be re-used by private sector operators who will create services that the public sector couldn't have created alone. If today the administrations are at the service of the citizens, tomorrow this might have to change, and the administrations might need to offer services to these citizens but also to the commercial operators that will in turn offer specific services to the same citizens. This requires a change in mentality.

2) Need to see the bigger picture: Open Data is a good incentive for improving the administrations' information management system, in order to get positive Return on Investment in the future

The public sector is the first beneficiary of Open Data, because it forces the administrations to invest in the management of their information, and in structures that will facilitate their work. If the administrations invest appropriately in Open Data policies, they will get a financial return on investment down the road, even if this starts with a costly investment. Furthermore, reviewing their whole information management systems will have several other positive consequences, such as allowing to work more efficiently transversally and to break the silos, even within each administration.

[7] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).

3) Need to make sure that Open Data will be useful for all, not just for the private companies

Administrations need to ensure that re-using Open Data is as easy as possible for everybody, and not only for the private companies with IT experts, so that the citizens can technically access public data at a reduced costs, instead of having to rely on expensive private services. The citizen should have the choice.

4) Need to be careful about the data quality

The administrations need to reach a sufficient level of quality to provide a minimal guarantee of data reliability. Today, even for internal use, the control over the quality of the data is sometimes insufficient. Of course, it is not because administrations must maintain the quality of the data for their own service that they have to do more than that in the name of Open Data. But administrations should always aim for better data quality, in order to improve the quality of the public services that they offer. In order to ensure the quality of the data, it is important to have a sufficient budget for these Open Data policies. They said quality and trustworthiness of the data should be outlined in the meta-data and in the terms of the re-use licence, so that the re-users know precisely what they are getting. This is especially true with linked meta-data. Indeed, if the datasets structure and the meta-data referring to it is standardised, it will allow re-users to combine various independent datasets. A certain unity for the exchange of information is required. For instance, it is not satisfactory for re-users to get data from three different regions, structured in three different ways.

5) Need to put more focus on what the re-users expect

Re-users sometimes have very little knowledge about what public sector information is available for re-use. Moreover, they might also not know how to process the public sector data. Indeed, due to the lack of standardisation about the format of the data and the meta-data, re-users face technical difficulties in combining various datasets. In this regard, it was pointed out that Open Data is not just about making the data open and available, but also about facilitating the re-use through exhaustive meta-data. However, it is challenging for the administrations to decide on the level of specification that they want to reach in the meta-data. Indeed, re-users are not only expert private sector companies or NGOs, but could also be common citizens. Hence, the requirement is to create meta-data that is specific enough for the "professional" re-users, while still being usable by common citizens.

At the moment, the focus is only on the offer of data and not enough on the demand side. Many re-users, even small organisations, need access to public sector data but they do not know where to get the data and how to overcome the technical barriers. However, administrations also want to prevent bad re-uses from people who have bad intentions or build bad services.

6) The administrations call for more visibility on what is done with the re-used Open Data – Data tracing

The administrations have very little knowledge about what is done with their data. This is a political stake, as the political deciders would like to be able to see what the outcomes of these Open Data policies have been, to justify the money spent. Moreover, if the administrations knew what was done by the re-users and saw that it was valuable, they would be more motivated to increase the opening of the data. This idea of tracing is perceived, by some, as being important for efficiency purposes and for generating public value. It can also be justified by the fact that the administrations would like to

keep some "control" over the data, as they are scared to be liable for the illegal re-use that could be made out of their data.

COMPLIANCE WITH DATA PROTECTION AND SECURITY RULES

This requirement focuses on the fact that the administrations have to adapt the rules contained in the EU General Data Protection Regulation that is applicable since May 2018. This is seen as a major novelty for the administrations, which seem very anxious about the effect of this new Regulation on their work and especially about the severe sanctions provided for in case of violation. This fear should not be exacerbated as this Regulation is, to a large extent, similar to the Directive 95/46[8] that it will replace. Indeed, the core principles, obligations and data subjects' rights contained in the Regulation already existed in the Directive. The main novelty for the administrations is that the system of data protection will shift from an obligation of prior notifications to the Data Protection Authority, to an obligation of accountability, record keeping and of privacy-by-design / privacy-by-default processing. They also have to appoint a Data Protection Officer. They are however, not be affected by the new "Data portability right". From a security point of view, and similarly to what was already required by the Directive, the administrations must implement proportionate technical and organisational security measures. Finally, it should be underlined that, during the focus groups on Open Data, some Data protection related concerns for the building of e-services were expressed. These are outlined below.

DATA PROTECTION IN BUILDING E-SERVICES

It is important to build e-services by including the legal team from the start, and not just to ask their opinion at the end, when everything is already built from a technical point of view. This can sometimes be frustrating for the technical team who is told by the legal team that they cannot do certain things that they intended to do. This necessity to combine the technical and the legal issues is at the heart of the function of the future Data Protection Officer. This dialogue is also important to have, in order to implement the principles of privacy-by-design and privacy-by-default included in the EU General Data Protection Regulation. The Data protection legal issues should be tackled from the start of the building of the e-service.

It was nevertheless mentioned that there is a lot more Data protection awareness now than before. Even if it is perceived as slowing down the processes, the focus group participants agreed that, on the whole, it was a good thing. In this regard, it was discussed that Data protection related issues is something that is not only relevant for companies, but for everyone. The population should be made aware that the way data is exchanged has privacy implications. Right now, people willingly share many indicators out of which personal information can be inferred. According to the focus group participants, people are even more willing to share information with private companies, than with the public sector, because people receive something directly in return from the private companies, while they do not always see clearly what the public sector has to offer in exchange for their personal information.

It was concluded that there is a definite need to work on Data protection awareness, especially when one considers all the emerging technologies. But awareness is only the first step. Its goal is to create

[8] This Directive was transposed in the Belgian law of 8 December 1992 on the protection of privacy with regard to the processing of personal data, which will need to be revised as well.

transparency about what happens with the personal data, so that the data subjects can make an informed decision. For Big Data, this is one of the major issues, as the data subject does not know what might happen with the data down the road. Indeed, the risk exists that data that is provided today for a well-defined purpose could be re-used, through the combination of datasets, for unexpected profiling purposes and undesirable automated decision-making.

ENABLER 7: SEMANTICS

In WP 2 the team asked whether the interviewees used geo- or location data. Sometimes the answer was negative, but when they were asked if they used addresses, or a map, their answer always was positive. The aforementioned confusion could be explained by the fact that the meaning of geo- or location data is not clear, but it could also be explained that – according to the focus groups on geodata – the paradigm shifted from the concept of 'GIS', to the concept of 'geodata', to the concept of 'data'. The geo-community does less and less refer to the concept of 'GIS', and more and more to the concepts of 'geodata' and 'data, because everything has a location element. This is an important conceptual evolution as now it is recognised that 'geo'-data is present in all types of data. As quoted by one of the focus-group attendees: "*We had a luxury to evolve our data to a certain level and now we notice that we are not on an island anymore and have to work with other data groups.*" In other words, the geodata-producers have to continue to build bridges to other data and datasets.

COMMUNICATION AND CAPACITY BUILDING IS KEY

Nevertheless, even when it is true that location became so mainstream that it is not recognised as separate data anymore, the answer 'no' as mentioned above can also imply that people are insufficiently aware of the location component of data, which is hampering the efficient combination of that data through location. It is recognised by the focus groups participants that communication about location data and services (from the governments) and the skills of people to handle location-based data must be improved significantly. One should do better marketing, communication about location based data and educate people in handling such data and in unlocking the potential of location based data.

ENABLER 8: LOCATION-BASED DATA

COORDINATION

AUTHORITATIVE DATA, BASE REGISTRIES, REFERENTIAL DATA AND THEMATIC DATA

Administrations define authoritative sources by decree or law in order to ensure that institutions make use of the same referential and thematic (geo)data or datasets. In this way they can geo-enable their services in a more interoperable way as they can exchange and combine other types of data more easily and efficiently. Those authoritative sources can be base maps that are made up of defined authoritative individual sources (e.g. buildings, roads). Authoritative sources have to meet strict conditions in terms of quality, update frequency, recognition and common acceptance. Certain data or datasets are sometimes identified as authoritative data or sources when they do however not meet the same high standard (quality) as authoritative data. This kind of data or datasets can as such be

regarded as a middle category: Administrations consider them as authoritative in their daily use although they do not meet the quality standards put forward by the law.

At local level, municipal services often keep their own data to do their daily job, and refer only when necessary to the authoritative source. And, although authoritative sources were defined, it does not mean that those are always used. The central Flemish address register (CRAB), for example, which already exists for some years, is still not being used by 20 municipalities (and they are not santioned for it, because one is not inclined to fine someone who is not using the authoritative source). Nevertheless, Brussels and Flanders are already most advanced with having their authoritative sources defined . At the Federal and Walloon level, the responsible institutions (DG Digital Transformation and EWBS) are still trying to implement the rules by a decree for the definition of authoritative sources. Authoritative sources are defined by each region and federal level, and even by cities by their own. And, although there is no hierarchical relation between the federal level and the regions, the participants stated that there should be some kind of collaborative hierarchy with regard to the data.

Finally, a distinction can be made between referential data and thematic data. In Wallonia this is still an ongoing discussion, while in Flanders already some base registers for referential data exist (e.g. addresses, roads, buildings).

An example: Brussels is trying to separate the sources for updating the Urbis base map. They separate the update of the different authoritative sources, which makes the updating processes more fluent. Some have to be updated every day (cadaster), others every week, fortnight, month, … . The CIRB is breaking down data silos of the municipalities by offering an open solution wherein the municipalities are the owners of their own data, but where the entire data set belongs to the region. The municipalities and also Brussels Environment update and master their data for their territory or theme in a main data repository, which in itself is mastered by the Brussels Region. The entire repository is accessible for all stakeholders (read-only). Every two weeks there is an update of Urbis – as a total source.

E-SERVICE AS A SERVICE

Location data is being published in several formats, ranging from downloadable data and 'simple' webmap or feature services, to e-services as a service. Such services can go much further than the ordinary "putting the data online on a download-portal". It was stated that e.g. in the Netherlands, the open data is delivered as raw open data, and that you still need someone to translate that data into something that can be used easily, and as such the open data is not so open (free) anymore. SPW has published open data, and enables that data in application through ESRI-APIs. Everybody can use it, but one has to pay a license. The Walloon provinces do so for example, the price is not prohibitive, although they are also looking into open source solutions.

Such e-services as a service could be in the form of APIs, but can go even further like the Brussels example, the so-called Urbis-as-a-service, where a user can upload his geo-data (e.g. firehydrants) and where it then is published as a mapservice (e.g. in combination with the Urbis base map). Non-pure-geo data interaction with the authoritative sources is usually through webservices and applications. Many clients use authoritative sources (or not-yet authoritative sources) in their management systems.

BEING NOTICED

In fact, it has been noticed that after the online publication of geo-data on portals, the data use has increased, or at least has become more visible. E.g. in Wallonia the contact of SPW Geo with the municipalities improved when they discovered the SPW-data online. Where the municipalities previously used private sector geospatial data, such as Google Maps, they now start to use SPW data and/or maps. Making the data available online in a geoportal would or should also have an impact on the use of the data. Although some argue that the increased visibility of that data has led to an increased use of data, others argue that the opening of the data has not attracted new users. Another question that the participants raised is whether the use of geoportals has led to a decrease of the administrative load for the providers of the data (for licensed data) and an increased insight in the use of the data (by monitoring the use) or that the administrative processes were not part of the renewal and rethinking of the services.

INTEGRATED APPROACH

Being noticed applies to the data itself and also to the governance of data in the administrations. In Flanders they launched a steering group called "Flemish Information and ICT-policy" that advices the Flemish government. This steering committee is existing since 2016 and brings together the Flemish geospatial, ICT, archiving, and data representatives and can give advice on the information and ICT policy to the Flemish Government. These recommendations become binding once the Flemish Government has approved them and they then apply both within the Flemish government itself and between the Flemish government and the provincial and local authorities. In addition, this steering body is given the assignment to direct the mutual coordination between the intra- and inter-administrative strategic digitization projects, bundled in the Flanders Radical Digital program.

UP-TO-DATENESS AND PRODUCTION OF DATA

The regional and federal levels are looking for opportunities to collect 'their' data more economically in order to keep their data as up to date as needed, within the budgetary limits. One possibility that already is being explored is the exchange of data sets between administrations. Or, to have the data collected in other administrative services at the local level. An example is the buildings data set of Flanders which is administratively linked to the license administration for constructing and demolishing buildings. In Wallonia however, the organization that is responsible for those building-licenses does not want to change their way of working in order to deliver update-information to the buildings-data set. Other opportunities that are proposed is to embrace crowd-sourcing and to impose open data regulations for the other direction than the one that already exists today, i.e. from private to government. Today it is, according to the respondents, too much a one way exercise. Government employees in some cases can report back errors (e.g. City of Gent; at federal level the users of the Incident and Crisis Management System on the map of the NGI, and several 112-dispatching centers) but it is still very much under exploited. Also the commercial sector could do more. For example, Google and other private companies want to make use of governmental data, but do not provide any information or data which could be useful for policy making or have a public interest in return. A suggestion was formulated to provide onlyaccess to data when two conditions are agreed upon: (1) The user send potential updates of the data to the provider of the data, and (2) there should be transparency towards the provider of the data on what results have been achieved

with the data.

According to the participants, and in line with the results of the focus groups on Enabler 6: Principles, Policies and Frameworks, there are two main arguments for open data: (1) support the economic developments and (2) increase transparency on what governments do. Thelatter should also, according to the respondents, apply to companies. Real time update are not (yet) possible. Datasets always contain old data, even for such companies as TomTom and Here: two months old data is real time. Nevertheless, one could adopt real time data, of for example moving GPS-devices, to detect changes and one could use satellites to map land cover and to have fast updates automatically. Other themes require terrain work. For example, we do not know where the students live in Gent, there is no register. We look at bells to see how many people live at one place.

THE BELGIAN MAP

According to the respodents, the National Geographic I should play the role for the national level and be the link with the international level in the two directions. The National Geographic Institute should nevertheless switch from primarily producing data, to gathering and translating regional data into a national dataset. With that, less resources would be wasted and data could be more up-to-date and updated as close to the source as possible. It is postulated that when the National Geographic Institute is going to integrate the regional and local authoritative data, then it should avoid to copy that data, but directly 'link' it. The example was given of the CIRB that can drill down various sources from one web-service. With that, if one item is updated than all clients immediately work with the updated version. It still is to be found out though, whether that would work out for the national level too, for complexity (possible conversion of data) and related performance reasons. As there is no hierarchical relation at the moment between the federal level and the regional, provincial and local level. It is not possible to apply a top-down approach, or even bottom-up, but rather more a network approach that is based on negotiation and change management would be suggested.

INTEROPERABILITY

There are several challenges with regard to interoperability. Part of that is that authortative sources do exist, but not too many yet, and even if they exist, one often works with copies of authoritative data and that data ages. Another issue is that the discussion goes beyond location-based data, as according to some, location-data is just a piece of the data 'cake'. And, it is so complicated to have one standard for all types of data and to have a similar way to link different types of data together in, for example, one metadata scheme or dataportal.

In line with the focus group results of Enabler 6: Principles, Policies and Frameworks, data users (and producers) hope that the PSI Directive will be more precise about the format of open data. Currently organisations are strongly focused on their own data formats, without looking to the format used by the others. However, the PSI Directive is only dealing with licensing and not with the format of the data. The INSPIRE Directive does define many important things for location data such as the exchange format and the metadata. However, it does not have the same requirements as the PSI Directive. There are nevertheless some initiatives that try to link different types of data, and different types of data catalogues, such as the DCAT-initiative (that makes metadata comparable between countries and cross-domains). The link with the INSPIRE Directive – another standard in which already so much

effort was invested – is unclear for many. Also the OSLO²-initiative (Open Standards for Linking Organisations) is still rather unknown outside the Flemish administrations, according to the respondents.

The INSPIRE Directive is supposed to generate cross-border interoperable data, but if one crosses the country border then the data 'jumps': One road on both sides of the border just ends nowhere and continues from nowhere. This happens as different countries or regions work with their own precision levels (e.g. Wallonia: 20 cm precision, France: 40 cm precision) and methods and there is no 'frontier' node. There are regional workgroups to fix that, but it goes slowly.

INCREASED DATA USE

Another quite important issue is the incompatibility of licenses, even when licenses are intended to foster free use of data, they often exclude its combination with data under different open (or closed) licenses. Additionally, in the "exception" category in the PSI Directive there is no mandatory license, so we might end up with 150 different licences for the federal level in Belgium. For the user that makes no sense. Only those who already used the data before it became open keep on using that data, and only few start-ups started using the open data. It means that the open data initiative does not really stimulate new start-ups and generate new businesses, which was the intention of the PSI Directive. Because of the license incompatibility issues, only those who already used the data keep using the data, and there is little extra market.

STANDARDISATION OF (GEO)DATA AND REGULATION

The complaint was heard that the INSPIRE Directive is a nice idea, but the developers of the INSPIRE Directive did not think through the whole procedure before implementing it (from its conception to its implementation and use). For example, for the address-format definition, administrations are still defining identifiers, but legally they are already obliged to have a list of cadastre-addresses in a certain format. There certainly is a discrepancy between the law and the reality. More concretely, one can ask which users are in fact asking for INSPIRE compliant data when the data is not seamlessly usable with other data sets of similar nature.

4. TRANSLATION OF REQUIREMENTS INTO RESEARCH QUESTIONS

The requirements identified above have led to the definition of a number of specific research questions that are listed below and that will guide the research team throughout the rest of the FLEXPUB project. Such a list of research questions was originally not required, but based on the findings of WP 2 as well as the findings of this WP, the team agreed that it would be good to have a number of guiding research questions which are used as a guide throughout the rest of the project. Especially, those research questions are usefull for WP 4 Enablers and will allow the team to give a highly structured and easy to follow answer in the next Reports. The researchers have carefully selected those questions, based on three guiding principles, presented below in decreasing order of importance:

- **Impact options:** This project aims to have an impact on the functioning of the administrations in Belgium, especially the Federal administration. Therefore, it is deemed important to put attention and invest resources and capacity on topics where the team can have an impact. One of the requirements on which this project might have little influence is the political interest in geospatial data. While the team detected this requirement and reported on it, it has been decided not to focus on it, as it will unfortunately not be possible for the team to change this situation.
- **Importance of the requirement:** Related to the first selection criteria is the overall importance of the requirement. Some requirements will have a broader and/or deeper impact if changes take place than others, and based on the results of this WP a selection has been made.
- **Personal knowledge and research focus:** A final selection criteria is the personal knowledge and research focus of the research team. The three PhD researchers all have their own specific field of knowledge and expertise. It should however be underlined that this factor only plays a highly limited role in the decision on the future research questions that will guide the research project.

Based on the results of WP 2 and the results of this WP, and in particular the above described selection criteria, i.e. (1) the impact option, (2) the importance of the requirement, and (3) the personal knowledge and research focus, the research questions for each of the requirements have been defined after strong deliberation by the team. Those questions will guide the research team throughout the rest of the FLEXPUB project, especially WP 4, and are the following. Please note that there is for each of the enablers a general research question, followed by a sub-research question.

- **Processes:** How can the effective participation of relevant stakeholders in the development of public e-services be ensured?
    - How would the citizens like to be considered in e-government?
    - What are the drivers and barriers regarding participation of the citizens, public servants, political representatives and software developers (Private/Public)?
    - What are the most appropriate methods to include relevant stakeholders in the development of public e-services?
    - What should the role and sourcing model of the private sector be in the development of public e-services?
- **Organisational structures:** How can the organisational structure of the Belgian federal state be contructed to enable flexible and innovative e-services?
    - How can the coordination at the federal administrative level be organised to facilitate

the development of e-services?
    - Which coordination instruments can be used to facilitate the development of e-services?
    - How can the coordination between the federal and regional administrations be organised to facilitate the development of flexible and innovative e-services?
    - What kind of organisational structure is necessary to ensure that the respect for the organisational independence and the demand for a stronger coordination is respected?
- **Service infrastructure and applications:** What is the optimal technical ecosystem to enable the delivery of public e-services?
    - How can the common acquisition and/or sharing of hardware and software among one administrative level and across administrative levels be ensured?
    - How can the uptake of technical standards facilitating data exchange between administrations be ensured following a building-block and micro-services methodology?
    - Which elements make a public e-service user-friendly?
    - Taking into account the federal structure of Belgium, which high-level technical architecture is the most optimal to facilitate public e-service delivery?
    - How will the service infrastructure of the administration be impacted by the legal obligations pertaining to cyber-security?
- **People, skills and competences:** How to tackle the challenges faced by the administrations regarding the digital competences of both the citizens and the civil servants?
    - How can the administrations contribute to reduce the digital divide?
    - How can we insure that the administrations go towards ever more digital innovation and flexibility while ensuring that people with no (less) digital abilities are not left on the side of the road?
    - How can the administrations increase their attractiveness in order to be able to recruit people with specific digital skills?
    - What is an optimal financial model for the development of flexible and innovative e-services?
- **Culture, ethics and behavior:** How can the culture and behaviour of the administrations become more oriented towards an ever-more digital working environment?
    - What explains the current position towards disruptive technologies within the federal administration?
    - Which actions can be taken to ensure the uptake of those disruptive technologies?
    - What are the reasons leading to the silo culture that exists within the organisations of the federal administration?
    - What actions can be taken to tackle this silo culture?
    - How can the political support for geospatial data and e-services be increased?
- **Principles, policies and frameworks:** How to tackle the regulatory challenges faced by the administrations in developing public e-services?
    - How did the PSI and INSPIRE Directives impact the Open Data policies within the administrations?
    - What should be done to tackle the remaining barriers to an effective Open Data environment?
    - Which Open Data licence model should be used by the administrations?
    - What should the administrations do to be GDPR-ready and compliant?

- **Semantics**
  - What is a commonly acceptable definition or typology of "e-service"?
  - What is a commonly acceptable definition or typology of "location-based data"?
  - How to ensure the acceptance of a commonly agreed definition of "e-service" in Belgium?
  - How to ensure the acceptance of a commonly agreed definition of "location-based data" in Belgium?
- **Location-based data**
  - What are the criteria / conditions required for a dataset to be considered as an "authoritative source of data" – both within and across policy areas and policy levels?
  - How can silos, within one policy level and between different policy levels, be removed?
  - How can organisations, whose core task is disconnected from location-based data, be supported in using this data in their e-services?
  - How can location-based data be made available for (re-)use to organisations whose core task is disconnected from location-based data?

5. NEXT STEPS

WP 4 – ENABLERS

After finalising WP 2 and 3, the team started working in January 2018 on the enablers (WP 4) that will provide solutions to the identified requirements[9]. In order to do so, the team will compile the results of the in-depth interviews, the general questionnaire, the citizen questionnaire, the focus groups and the international practice comparison. On top of this, the team will conduct additional interviews and an extensive literature review in order to identify best practices and possible solutions.

This interdisciplinary analysis will integrate different views (Law; Business engineering; Public administration; Geo-spatial knowledge) and will match the COBIT enabler structure used for WP 2 and 3. It should, however, be underlined that the each team member has a number of specific enablers on which he works, therefore the focus will be more specific and individualised. Nevertheless, these solutions will be cross-checked by all team members. Therefore, the team will, for each of these enablers, present potential solutions to solve the requirements identified in WP 2 and WP 3. Those solutions will be context specific.

WP 5 – CASE STUDIES

The team started the case studies after having received the feedback from the members of the Follow-up Committee on their draft strategy. In order to do so, the team will work on concrete practical cases of administrative (dis)functioning, through the means of documents' analysis and stakeholders' interviews. Out of the case study proposals kindly suggested by the members of the Follow-up Committee, the team selected three case studies that pertain to geospatial e-services in which not only Belgian federal administration(s), but also stakeholders from other levels of power (regional and local) are involved.

The team has selected the following three case studies:

- **BeSt Address:** This case was signalled by a high number of members of the Follow-up Committee, as it includes various stakeholders (both at the Federal and Regional level), as it forms the basis for a well-functioning geospatial infrastructure, and as it has a strong historical-legacy (project started at beginning of the 21st century). It especially points to the need to have a common understanding and implementation of an "address", and can be seen as a basic element to allow for a common use and exchange of geospatial data and the future development of geospatial e-services.
- **Use of geo-data by the emergency services:** A number of technical challenges linked to the mapping of emergencies have been signalled. Projects such as ASTRID (All-round Semi-cellular Trunking Radio communication system with Integrated Dispatchings), Cartography for wildfire fighting and ICMS (Incident and Crisis Management Systems) will be dealt with here. This case study has been selected as it presents the particularity of having an "end-user approach". Indeed, emergency services are end-users of public information held by various

[9] WP 4 has already started via the focus groups and the international practice comparison.

public authorities from different levels of power. This creates challenges for these emergency services in combining the data coming from various sources using different standards, in a single user-friendly and immediately usable tool.

- **Exchange of Patrimonial information:** Originally created as a tool for taxation, the cadastral information is increasingly being used by different stakeholders for urban planning. In this context, various organisations from different level of powers (Federal, Regional and Local) have to exchange more and more patrimonial information. This creates issues of synchronisation and update of this information. Highly interesting in this respect is the recently created inter-federal Centre for the Exchange of Patrimonial Documentation, which is a cooperation between the three Regions and the Federal administration.

WP 6 AND WP 7: PREPARATION OF A DRAFT GENERAL STRATEGY AND BLUEPRINT

Thanks to the work done in WP 4, the team prepared a draft Strategy and Blueprint for flexible public (geospatial) e-services. The team presented this draft Strategy at the Follow-up Committee meeting of May 2018. The Members of the Follow-up Committee provided the team with feedback and comments on this draft Strategy, in order to make sure that the ideas and actions suggested in the Strategy meet the concrete needs of the administrations. Currently the team is preparing the Blueprint, which is developed in such a way that it complements the Strategy.

CONCLUSION

In this report, the FLEXPUB team outlined the results of Work Package 3 – "Requirements", aiming at identifying the needs and challenges that the administrations encounter for the development of flexible and innovative (geospatial) e-services, as well as the barriers that they face in doing so. In this sense, WP 3 complements WP 2 as it contributes to answer to the second sub-objective of the FLEXPUB project, namely "*Determine the key requirements for future e-service delivery by the federal administration*".

This report first fully described the methodology of the different research activities (Focus Groups and Citizen Questionnaire). Secondly, the report presented and analysed the results of the research activities. The data was gathered, and the results structured, according to the different COBIT enablers, namely "Processes", "Organisational structures", "Service infrastructure & applications", "People, skills & competencies", "Culture, ethics & behaviour", "Information" and "Principles, policies & frameworks". For reasons explained above, the team decided to add an extra category, namely "Semantics", and to transform "Information" into the more specific "Location-based data". Based on these COBIT enablers, a number of requirements has been defined:

- **Processes**
  - Stakeholders' participation in e-service development
  - Role of private sector and level of participation
- **Organisational structures**
  - Inter-organisational relations between different administrative levels and at the same level
  - Leadership development for the (geo)digital agenda
- **Service infrastructure and applications**
  - Shared hardware and software
  - Interoperability
  - User-friendliness of e-services
  - Innovation capacity
  - Balance between privacy & security concerns and efficiency of service delivery
- **People, skills and competencies**
  - Tackling digital divide among citizens
  - Public sector attractiveness
  - (Financial) resources of public administrations
- **Culture, ethics and behaviour**
  - Impact of technologies on working environment
  - Creation of a sustainable organizational & project network
  - Creation of network for political support
- **Principles, policies and frameworks**
  - Divergences of opinion on Open Data policies
  - Compliance with data protection and security rules
- **Semantics**
  - Understanding of concepts of location-based data and e-services
  - Exploration and communication on value of location based-data
- **Location-based data**
  - Silo structures of data, within and between organisations and government levels

- Integrated advice by stakeholders from the different sectors of location-based data, ICT, (e-)service delivery and data to the government
- Rethinking of licenses and standards
- Integration by default of (authoritative) location-based data in e-service delivery

Moving forward, the team will compile the results of the in-depth interviews, the general questionnaire, the citizen questionnaire, the focus groups and the international practice comparison. On top of this, the team will conduct additional interviews and an extensive literature review in order to identify best practices and possible solutions (WP 4). Also, the case studies will be continued (WP 5) as well as the refinement of the Strategy (WP 6) and Blueprint (WP 7).

As a final word, the team would like to thank all those who participated in the WP 3. The people who were interviewed for the citizen questionnaire and who participated to the focus groups provided highly valuable input on identifying the requirements for delivering flexible and innovative (geospatial) e-services in Belgium.

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ANNEX

ANNEX 1

Please note that the questionnaire was only used for French speaking Belgian citizens, therefore, the questionnaire is only available in French. Please contact Mr. Anthony Simonofski (KU Leuven / UNamur) to ask for his consent in case those questions would be re-used, both when used in French or in any other language.

Introduction

Nous vous remercions d'avoir accepté de compléter ce questionnaire ! Veuillez noter qu'il n'y a pas de bonne ou de mauvaise réponse car c'est votre opinion en tant que citoyen(ne) qui nous intéresse dans cette étude. L'information que vous nous fournissez sera bien entendu traitée de manière anonyme.

Ce questionnaire vise à identifier votre opinion concernant l'informatisation de l'administration publique. Cette informatisation, ou « administration électronique », consiste en l'utilisation de moyens informatiques par les services administratifs afin de fournir de meilleurs services aux citoyens. Cette fourniture de services se fait notamment via les services publics électroniques tels que Tax-On-Web, MyPension, etc. Néanmoins, le rôle du citoyen au sein de cette administration électronique fait débat dans le monde de la recherche. Dans ce contexte, nous avons réalisé ce questionnaire afin de vous demander ce que vous attendez de cette informatisation de l'administration.
Remplir ce questionnaire ne devrait pas vous prendre plus d'une dizaine de minutes.

Digital Literacy: Public e-service use

1. A quelle fréquence utilisez-vous des services publics électroniques?
    a. Jamais
    b. Environ une fois par an
    c. Environ une fois par mois
    d. Environ une fois par semaine
    e. (Presque) chaque jour
2. *If Q1 is a., then question:* Pourquoi n'utilisez-vous pas de services publics électroniques ? Plus d'une option possible. *Answers have to appear randomized – except for option k. that remains the last answer.*
    a. Je ne suis pas au courant de leur existence
    b. Je préfère le contact personne-à-personne
    c. D'autres canaux sont plus à même de répondre à mes besoins
    d. Les services électroniques sont trop compliqués à utiliser
    e. Je m'inquiète du manque de protection de ma vie privée et du manque de sécurité de mes données.
    f. Les services électroniques connaissent des défaillances techniques
    g. Je n'arrive pas à trouver le service électronique dont j'ai besoin
    h. Je ne pense pas que je gagnerai du temps en utilisant les services électroniques
    i. Je n'en ai pas besoin actuellement
    j. Autre : …

3. *If Q1 is NOT a., then question*: Pourquoi utilisez-vous des services publics électroniques ? Plus d'une option possible. *Randomize answers, except for i. that remains the last option.*
    a. C'est la seule possibilité
    b. Je gagne du temps
    c. Je gagne de l'argent
    d. Je peux l'utiliser n'importe où à n'importe quel moment
    e. La fourniture des services est simplifiée
    f. J'ai davantage de contrôle sur la fourniture des services
    g. La fourniture des services est plus transparente
    h. Autre: …

Consideration in E-government : Coproducer vs Democratic participant vs Customer

4. A. Veuillez indiquer dans quelle mesure vous êtes d'accord avec les affirmations suivantes. Elles concernent VOTRE potentielle utilisation de l'administration électronique de votre ville/ de votre région ou pays. (site web, services en lignes etc.). Préambules services locaux : exemples

Pas du tout d'accord	Plutôt en désaccord	Ni en accord ni en désaccord	Plutôt d'accord	Tout à fait d'accord

NEW LOCAL :

Customer Orientation

- Vous souhaiteriez que les services publics électroniques de votre ville soient plus accessibles, rapides et intégrés avec les autres niveaux de pouvoir.
- Vous seriez prêt à payer une somme supplémentaire (directement ou par taxes) afin que les services publics électroniques de votre ville soient plus accessibles, rapides et intégrés entre niveaux de pouvoir.

Democratic Orientation

- Vous prendriez le temps de consulter des informations pertinentes concernant votre ville si ces informations étaient disponibles en ligne (ex : budget, cadastre, débats politique, etc.).
- Vous prendriez le temps d'utiliser une plateforme en ligne pour participer aux processus démocratiques de votre ville si une telle plateforme existait (ex : élaboration du budget, décisions politiques,…).

Coproducer Orientation

- En échange d'un investissement plus important en temps de votre part, vous privilégieriez l'utilisation de services publics électroniques si cette utilisation réduisait la charge administrative globale de votre ville.
- Vous prendriez le temps d'envoyer des informations pertinentes aux services de votre ville via une plateforme en ligne si une telle plateforme existait (ex : si vous remarquez un problème sur la voirie, des déchets encombrants, etc.).
- Vous prendriez le temps de participer au développement de services publics électroniques de votre ville si l'opportunité vous était donnée (ex : en communiquant vos exigences via interviews , en testant ces services, etc.).

NEW FEDERAL/REGIONAL

Customer Orientation

- Vous souhaiteriez que les services publics électroniques régionaux et fédéraux soient plus accessibles, rapides et intégrés avec les autres niveaux de pouvoir.
- Vous seriez prêt à payer une somme supplémentaire (directement ou par taxes) afin que les services publics électroniques fédéraux et régionaux soient plus accessibles, rapides et intégrés entre niveaux de pouvoir.

Democratic Orientation

- Vous prendriez le temps de consulter des informations pertinentes concernant votre région et pays si ces informations étaient disponibles en ligne (ex : budget, cadastre, débats politiques, etc.).
- Vous prendriez le temps d'utiliser une plateforme en ligne pour participer aux processus démocratiques de votre région et pays si une telle plateforme existait (ex : élaboration du budget, décisions politiques, etc.).

Coproducer Orientation

- En échange d'un investissement plus important en temps de votre part, vous privilégieriez l'utilisation de services publics électroniques si cette elle réduisait la charge administrative globale de votre région et pays.
- Vous prendriez le temps informations pertinentes aux services de votre région et pays via une plateforme en ligne si une telle plateforme existait (ex : si vous remarquez un problème sur la voirie, des déchets encombrants, etc.).
- Vous prendriez le temps de participer au développement de services publics électroniques de votre région et pays si l'opportunité vous était donnée (ex : en communiquant vos exigences via interviews, en testant ces services, etc.).

Citizen-Participation in Service Delivery (Co-Design)

1. A quel stade du développement d'un service public électronique aimeriez-vous participer ? Plus d'une option possible.
    a. Etre inclus dans le développement d'un service public électronique ne m'intéresse pas
    b. Initiation du projet (décision de développer un service public électronique)
    c. Analyse des besoins/exigences (résultant dans une liste des besoins/exigences des parties prenantes)
    d. Conception (interface utilisateur et architecture logicielle)
    e. Implémentation du service public électronique (résultant en un logiciel)
    f. Vérification du service public électronique (test du logiciel)
    g. Maintenance (évaluation globale du service public électronique)
2. *If Q1 is b-g, then question:* Comment aimeriez-vous contribuer à la création d'un service public électronique? Plus d'une option possible. *Randomize answers, except for i., that remains the last option.*
    a. Représentation dans l'équipe du projet
    b. Implication dans un atelier pour utilisateurs regroupant les développeurs et des utilisateurs potentiels
    c. Via une plateforme en ligne pour soumettre des idées, commentaires, feed-back
    d. Interaction via les réseaux sociaux

e. Via des enquêtes (en ligne)
f. Via des interviews / discussions en groupe
g. Participation à un Living Lab
h. Via des tests d'utilisation sur des prototypes de service public électronique
i. Autre : …

Private E-services Use

1. A quelle fréquence utilisez-vous les réseaux sociaux (facebook, twitter,…) ?
    a. Jamais
    b. Environ une fois par an
    c. Environ une fois par mois
    d. Environ une fois par semaine
    e. (Presque) chaque jour
2. A quelle fréquence utilisez-vous des services électroniques privés (Ebay, Amazon, PC Banking, Réservation voyage en ligne,…) ?
    a. Jamais
    b. Environ une fois par an
    c. Environ une fois par mois
    d. Environ une fois par semaine
    e. (Presque) chaque jour
3. *If Q2 is a., then question:* Pourquoi n'utilisez-vous pas de services électroniques privés? Plus d'une option possible. *Answers have to appear randomized – except for option k. that remains the last answer.*
    k. Je ne suis pas au courant de leur existence
    l. Je préfère le contact personne-à-personne
    m. D'autres canaux sont plus à même de répondre à mes besoins
    n. Les services électroniques sont trop compliqués à utiliser
    o. Je m'inquiète du manque de protection de ma vie privée et du manque de sécurité de mes données.
    p. Les services électroniques connaissent des défaillances techniques
    q. Je n'arrive à trouver le services électroniques dont j'ai besoin
    r. Je ne pense pas que je gagnerai du temps en utilisant les services électroniques
    s. Je n'en ai pas besoin actuellement
    t. Autre : …
4. *If Q2 is a., then question*: Pourquoi utilisez-vous des services électroniques privés? Plus d'une option possible. *Randomize answers, except for i. that remains the last option.*
    i. C'est la seule possibilité
    j. Je gagne du temps
    k. Je gagne de l'argent
    l. Je peux l'utiliser n'importe où à n'importe quel moment
    m. La fourniture des services est simplifiée
    n. J'ai davantage de contrôle sur la fourniture des services
    o. La fourniture des services est plus transparente
    p. Autre: …

Digital Literacy

A quel point êtes-vous familier avec les éléments informatiques ou liés à internet suivants ? Veuillez l'indiquer sur une échelle allant de 1= « Aucune compréhension » à 5= « Compréhension totale ».

Aucune compréhension	Faible compréhension	Compréhension moyenne	Bonne compréhension	Compréhension totale

1. Marquage ou « Tagging »
2. PDF
3. Logiciel d'espion ou « Spyware »
4. Wiki
5. JPG
6. Weblog
7. Mémoire Cache ou « Cache »
8. Logiciel malveillant ou « Malware »
9. Hameçonnage ou « Phishing »

Source : « Succint Survey Measures of Web-Use Skills » by Ezter Hargittai

Socio-economic characteristics

1. Dans lequel de ces intervalles d'âge vous situez vous ?
    a. En dessous de 20 ans
    b. 20-29
    c. 30-39
    d. 40-49
    e. 50-59
    f. Au dessus de 60 ans
2. Vous êtes :
    a. Une femme
    b. Un homme
    c. X
3. Quel est le plus haut diplôme que vous ayez obtenu ?
    a. Pas de diplôme
    b. Enseignement primaire
    c. Enseignement secondaire inférieur (jusqu'à 15 ans)
    d. Enseignement secondaire supérieur (jusqu'à 18 ans)
    e. Haute école
    f. Université
    g. Doctorat
4. Je suis une/un :
    a. Etudiant(e)
    b. Aidant(e)
    c. Salarié(e)
    d. Indépendant(e)
    e. Sans emploi

f. Retraité(e)
g. Autre : …

5. [Si "employé" ou "indépendant"] Travaillez-vous dans une administration publique ?
    a. Oui
    b. Non
6. [Si oui] A quel niveau ?
    a. Local
    b. Provincial
    c. Régional
    d. Fédéral
    e. Européen

Ninth screen

L'équipe FLEXPUB vous remercie vivement pour votre collaboration et pour avoir pris le temps de répondre à ce questionnaire. Votre contribution sera essentielle à notre recherche future.

Si vous avez le moindre commentaire, n'hésitez pas à nous le faire savoir dans le cadre ci-dessous : Provide a big box where the respondent can write his comments