FLEXPUB

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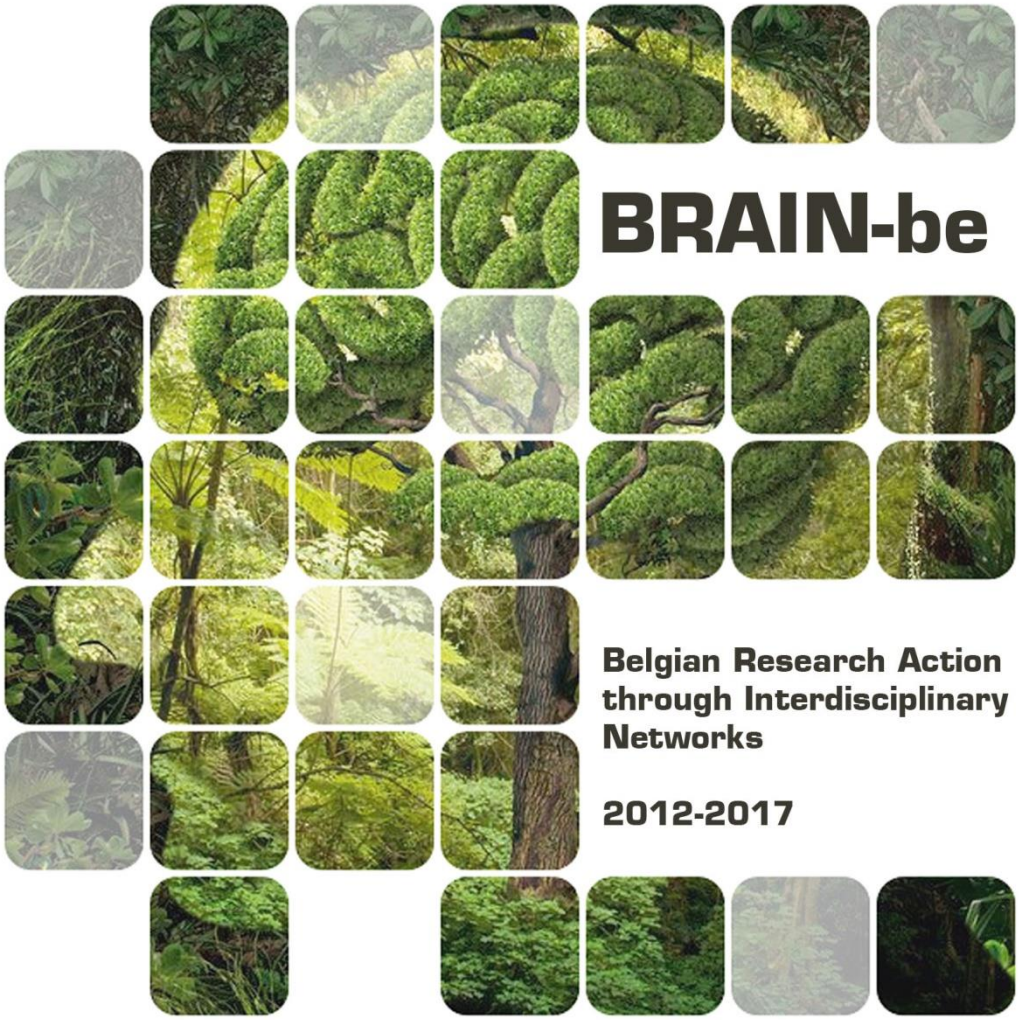

FLEXPUB

New Generation of flexible public services – the geospatial case

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NETWORK PROJECT

FLEXPUB

New Generation of flexible public services – the geospatial case

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FINAL REPORT

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ABSTRACT

The BELSPO BRAIN-be FLEXPUB research project (2016-2020) researched, during four years, how public (e-)services can be developed and how the federal government can stimulate and support public administrations in the development of those services. The research was limited to e-services presenting a geospatial orientation. Both theoretical and empirical/practical knowledge were obtained on the basis of the combination of qualitative and quantitative research methods; interviews, surveys, observations, case studies, and statistics, and test/use cases. A multi-disciplinary research approach, combining technological, legal and governance perspectives, led to the two-fold objective; (1) to create a federal Strategy for flexible geospatial public e-services and (2) to develop a federal Blueprint for enabling flexibility and innovation in the public sector, which goes also beyond the field of geographical e-services. The research project led to important societal and academic output, via continuous contacts with the public administrations and a strong embeddedness in the academic community.

1. INTRODUCTION

Public administrations have a great need to innovate in the field of the services that they offer. On the one hand, public administrations face complex challenges and it is expected from them to foresee more and more tailor-made public services. On the other hand, the public organisations are limited by their resources and their knowledge. Therefore, it has become crucial to develop efficient and creative e-services which, moreover, are capable of adapting in a flexible way to the changing needs.

In the context of this multidisciplinary research, two universities (KU Leuven and UNamur) and a federal institution (the National Geographic Institute) collaborated and studied how public e-services can be developed and how the Belgian federal government can stimulate and support the federal administration in offering public e-services which are adapted to the changing requirements. For practical purposes, the research has been limited to e-services presenting a geographical orientation in the implementation of a public policy. One can thereby think of public policies related to patrimonial information, and in particular the sharing of cadastral information, emergency services provided to citizens and the definition of a common Belgian address structure. Other examples of policies with a geographical orientation include the prevention of wildfires, the fight against fraud and the development of a common emergency service mapping tool.

The BELSPO BRAIN-be FLEXPUB research project, executed by the above-mentioned partners, started in 2016 and was finalised in 2020. The main objective of the FLEXPUB research project was twofold. Firstly, it aimed to develop a global federal strategy for the implementation of flexible geographical public e-services, and secondly, the project aimed to establish a federal blueprint for enabling flexibility and innovation in the public sector also beyond the field of geographical e-services. These main objectives encompass a number of specifically defined sub-objectives: To provide an overview of the current situation in the field of geospatial public e-services, to identify the future needs of the users and to define the possible options which could be used to provide an answer to the changing needs.

Through the means of a baseline measurement, an analysis of the stakeholder's requirements, relevant case studies and impact assessments, the current situation of the Belgian public services was studied in order to identify the future needs and the way through which the federal public administration can develop, manage and stimulate the use of these services. The results of the research formed a basis to identify the implementation conditions for the creation of sustainable e-services within the Belgian federal public administration. In order to achieve the main objectives, an interdisciplinary approach was deemed necessary. The various partners shared, within the four-year period, their extensive expertise by analysing the research project with their own disciplinary point of view. The research integrated these various perspectives (technological, legal, organisational, managerial) in a single coherent approach throughout the research period.

The Strategy for Flexible Geographical public e-Services and the Blueprint for Adaptive and Innovative Governments can be considered as the main visible results of the FLEXPUB research project. Indeed, it offers the federal public administration, the federal government, and other interested public administrations and government, a clear and visible result of the research. Besides these two documents, the research project has led to a number of other relevant outcomes such as a baseline measurement in the field of Belgian public e-services, a list of the stakeholders' needs and requirements, reports on the case studies, a hands-on toolkit etc. In order to preserve

the outcomes of all the different Work Packages, the researchers have therefore produced reports with a detailed description of the methodology and results. The most important results of the research project have been, and are still being, published in scientific and/or professional journals related to the various disciplines of the researchers.

In order to ensure an uptake and valorisation of the research outcomes, the researchers have organised several consultation rounds with the relevant policy-makers in the field of public e-services through the means of several Follow-up Committee Meetings, via workshops, focus groups, bilateral interviews and in-house presentations and sessions. Finally, and in order to preserve the valorisation element of the FLEXPUB project, a handbook of measures, including a toolkit, was produced by the researchers. The FLEXPUB project aimed not only to contribute to the functioning of the public sector, but to have also a wider social impact. This was achieved via the inclusion of many stakeholders of various sectors: Not only from within but also outside of the public sector and of various administrative levels. Think thereby of providers of public services but also of citizens and e-service developers – both from the public and private sector – which have an interest in fields such as physical space planning, environment, security, transports, health and employment. From a scientific point of view, the interdisciplinary, systematic and empirical approach of the research provided a great added-value for the execution of the research project, and especially the final results. Not only have the research results been presented at internationally renowned conferences and have they been published in scientific and internationally recognised peer-reviewed journals, the project has also ensured that three young researchers have been able to conduct their PhD research. It is expected that the results of the FLEXPUB research project will further continue to inspire others researchers.

This Final Report continues as follows. Firstly, the State of the Art and Objectives of the FLEXPUB research project are explained in Section 2. Afterwards, Section 3 explains the applied Methodology. Section 4 provides a detailed overview of the Scientific Results and Recommendations for the various Work Packages (2 – 10). Section 5 focuses on the Dissemination and Valorisation of the research results. Section 6 is focused on the Acknowledgements and finally the References follow in Section 7. The Final Report ends with the Annexes.

2. STATE OF THE ART AND OBJECTIVES

The ongoing evolution of society requires public administrations around Europe to tackle many new challenges. One can think of the demographic change, employment, mobility, security, environment and many other challenges. Overall, it can be said that public administrations are required to operate in an environment undergoing three major changes. First of all, there are the ongoing technological developments. Secondly there is a changing relationship with the end-users, i.e. citizens, business and other non-governmental actors. Thirdly, there are ongoing economic and budgetary pressures which influence the leeway of public administrations. Recent technological innovations, such as open data, big data, artificial intelligence, the development of social media etc., lead to more information and knowledge exchange as well as enhanced connectivity, interoperability, openness and transparency at all levels. At the same time, those technological innovations also pose risk, both for society and public administrations – think for example about security, privacy and the possible change in the balance of public values strived for by public administrations.

Besides the ongoing technological evolutions, which offer opportunities and pose risks, today's citizens are also more aware of their rights towards the state and in particular public administrations. They also have better access to information on public services and consequently have higher expectations of service levels, especially as they become accustomed to private sector organisations providing customisation and other benefits. Furthermore, citizens, businesses and other non-governmental actors are empowered with access to wider government information and open data, and expect governments to work together in order to serve their needs via technology – think for example about the exchange of data and information among the Belgian federal and regional administrations to serve the end-user. They are expecting improved and more individualised public solutions and services, efficient and effective service delivery, burden reduction and transparency. Questions on participation are growing, not only for co-producing services and public solutions, but also for the co-creation of policies, services and solutions.

A final and third aspect influencing the environment in which public administrations have to operate is the economic and budgetary climate. Economic and budgetary pressures force governments to be ever more efficient, reduce costs and be more competitive in a multi-polar world. These challenges, coupled with the ongoing consequences of the 2008 financial crisis have created renewed momentum in public service delivery. In order to meet these demands of the stakeholders, innovative and flexible ways have to be found that improve quality and provide customised solutions, while reducing costs.

When the project started in 2016, the Belgian federal administrations had, with strong support of FOD/SPF FEDICT – the FOD/SPF Information and Communication Technology, already taken a number of significant steps that satisfy the demands of future stakeholders. Those steps relate to legal, organisational and technical changes. Examples are the adoption of Law on federal service integrators, the establishment of the Federal Service Bus, and the launch of e-services such as eHealth, eBirth, eDepot, and eInvoicing. It needs to be underlined here that the Belgian federal administration has, for a long time, been a frontrunner when it comes to the digitalisation of the administration. An important element here is the development of the system of crossroad banks for the exchange of data among various public sector organisations. Think thereby for example of the Crossroads Bank for Social Security. Another crucial step was the introduction of the eID. Belgium was, thanks to the federal administrations, one of the first countries in the world to have

such a digital identity system. The Belgian federal government also committed to invest in the developments as proposed in the Digital Agenda for Europe, and has created its own agenda: Digital Belgium. During the execution of the FLEXPUB research project, the federal public administration continued to take other significant steps. Examples are the redesign of the federal administration leading to the transformation of the FOD/SPF FEDICT to the Digital Transformation Office as part of the broader FOD/SPF BOSA, the set-up of ITSME in collaboration with the private sector, the launch of the eBox etc. These are only few examples of the steps taken by the federal administration in order to deal with the above described changes.

However, in order to better streamline these significant efforts in the future and to be better aligned with the changing demands of the stakeholders, it was essential to develop a scientifically sound and comprehensive blueprint for an adaptive and innovative government. Such a blueprint was, at the start of the project, still missing. The FLEXPUB research project aimed to fill this gap. The resulting blueprint has been developed in such a way that it can contribute to tackling the complex and speedy challenges that cut across policy domains and departments of the Belgian federal administrations. As the topic of adaptive and innovative e-government is very wide, the FLEXPUB research project focused on the development of a strategy for flexible public geospatial e-services that have the potential to serve a wide range of stakeholders in multiple policy domains.

The main objectives of the FLEXPUB research project were therefore to develop a federal Strategy for Flexible Public Geospatial e-Services and a Blueprint for an Adaptive and Innovative Government. The 'e' in e-services (and e-government) refers to the emphasis on the digital aspect of the public services in this project. Besides the above-described three major changes that have been taken into account when developing both a Strategy and Blueprint for the Belgian federal administration, it is important to underline that the researchers also took into account the complex Belgian state structure. A Strategy and Blueprint could only be developed when taking into account also the relationships with the regions and language communities. Examples of policy domains which have been studied are the patrimonial information, the address structure and the emergency services.

A number of specific sub-objectives of the FLEXPUB research project were also formulated:

- To provide an overview of the status of the management of geospatial e-services at the federal government, and to value key processes dealing with this type of services;
- To determine the key requirements for future e-service delivery of the federal government;
- To identify the key enablers to achieve the changing e-service delivery requirements;
- To validate the identified enablers by analysing case studies;
- To set up a strategy for flexible public geospatial e-services;
- To write a blueprint for adaptive and innovative government; and
- To valorise the key findings of this research.

As already mentioned, the key project results refer to the development of a Strategy for Flexible Public Geospatial e-Services and a more generic Blueprint for an Adaptive and Innovative Government. Other results of the FLEXPUB research project are:

- An overview of the status of existing geospatial e-services of the federal government in 2016-2017 to be considered as the baseline measurement. This status formed the reference for the further research;

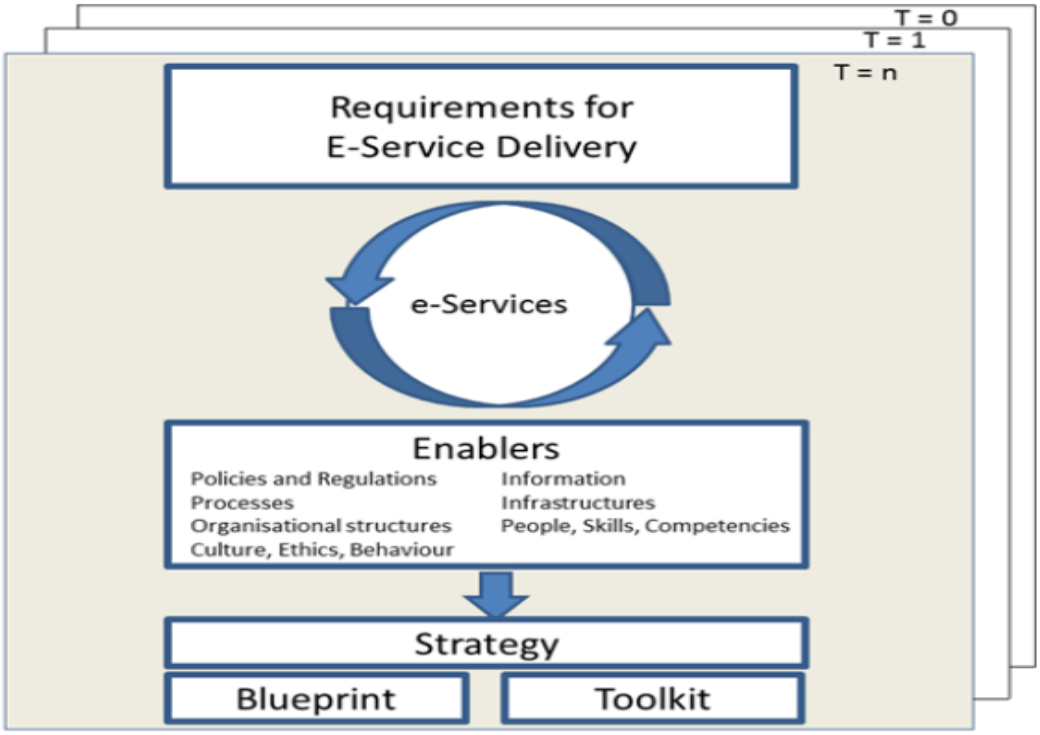
- An overview of the key requirements for public e-service delivery including a comprehensive set of key requirements, a relevant stakeholder classification for e-service delivery, a set of key requirements for the different stakeholders' classes, (inter)national trends of e-service delivery, and a list of good (inter)national e-service delivery practices;
- An identification of requirements for the key enablers to achieve the requirements for e-service delivery – including a list with descriptions of the determined enabling factors, and how they contribute or form a barrier to flexibility and innovation;
- A list of the policy options formulations including the associated risks and impacts;
- Three case studies to validate the identified enablers and policy options;
- The development of relevant and interesting tools (e.g. a methodology for agile software development in the context of e-government);
- Publications in scientific and professional journals, conference proceedings, and lectures notes;
- A website to ensure the outreach of the research outcomes;
- Project valorisations such as the organisation of two general assemblies on the project topic, user workshops, presentations at important governmental platforms, and a statement document.

3. METHODOLOGY

The development of flexible and innovative e-services relies on the paradigm of software development methodologies, which acknowledges different type of activities in the development cycles: requirements engineering, design, coding, testing, implementation and maintenance. As research has demonstrated that requirements are the cornerstone for project success, collecting 'requirements for e-service delivery' is at the core of the project. As the lack of user involvement and constant requirements changes are the source of many project failures, state-of-the-art development methodologies currently rely on the paradigm of 'agile' software development to better address the continuously changing demands of the software users. Agile methods resolve this issue by focusing on a permanent interaction with users through fast iterative development, allowing to rapidly test intermediate results before elaborating them to full-fledged software. While agile software development may be considered as a necessary condition for faster delivery of e-services, it is by no means a sufficient condition for an agile (flexible) and innovative government. More structural enablers such as an encompassing architectural approach, skilled people, a strategic vision, management support, etc. are also required. Moreover, alignment of service delivery to strategic objectives is not achieved automatically. This required unity and alignment, and can only be achieved through deliberate organisational engineering. While the field of enterprise engineering is still under development, throughout the past decade, several frameworks with practical guidelines for enterprise engineering have been proposed, mainly from design and governance perspectives. Examples are TOGAF (dealing with enterprise architecture), and COBIT (dealing with governance and alignment – COBIT stands for Control OBjectives for Information and related Technology). Such frameworks are however not specifically geared at ensuring adaptability and innovation, and moreover they are often experienced as too heavy-weight when fully implemented. To ensure a lightweight approach to achieving the objectives of flexibility and innovation, FLEXPUB therefore (only) uses the 7 enablers identified in COBIT to assess the current state of affairs and guide the strategy and blueprint with respect to the flexibility (agility) and innovation capability of the federal government when it comes to e-service delivery. The COBIT-enables are: 1) Policies and regulations; 2) Processes; 3) Organisational structures; 4) Culture, ethics and behaviour; 5) Information; 6) Infrastructure (with associated architectures and standards); and, 7) People, skills and competencies.

Figure 1 presents the resulting research framework of FLEXPUB including the main research activities: investigating requirements and enablers for flexible and innovative e-service delivery resulting into the formulation of a geospatial e-Services strategy and a blueprint for adaptive and innovative government. Finally, additional activities refer to the valorisation and dissemination of the research results and tools. In line with the principles of design research (Hevner, 2004), these activities are undertaken in parallel and iteratively. Starting with a baseline measurement ($T = 0$), an initial solution (policy) will be formulated ($T = 1$). Through the repetition of the design cycle ($T = 2, \ldots, T = n$), results will be repetitively validated and improved based on the outcomes of the case studies used for validation.

Figure 1: FLEXPUB research framework



Source: FLEXPUB (2016)

Within FLEXPUB, both theoretical and empirical/practical knowledge were obtained on the basis of the combination of qualitative and quantitative research methods; interviews, surveys, observations, case studies, and statistics, and test/use cases. This combination contributes to the quality of the results.

The starting-point of research was the baseline measurement of the geospatial e-services delivery of the federal government in 2016 (T = 0). This baseline measurement consists of a web survey and in-depth interviews with key stakeholders. The associated analysis is strongly based on the Actor Network analyses (Latour, 2005). The main strength of using the Actor Network analysis is that the analysed network does not merely contain people, but appropriate objects and organisations.

The baseline measurement results form part of the research necessary for the determination of the requirements for e-service delivery. The main drivers for changing public e-service delivery are likely key stakeholders inside or outside the federal government. For this research, it was essential to identify key stakeholders that share common requirements to e-service delivery. This was achieved by organising meetings with the key stakeholders. In order to enhance the quality of the determination of the changing requirements, it was also necessary to identify how the e-service delivery will look like in the (near) future. This was achieved by interviewing (inter)nationally recognised experts and reviewing key documents on future e-service delivery. Examples of relevant documents are: OECD 'Together for better public services – partnering with citizens and civil society' (2011), European Commission 'A Vision for Public Services' (2013) and 'Delivering on the European Advantage? How European governments can and should benefit from innovative public services' (2014). In the geospatial context, the United Nations Global Geospatial Information Management 'Future trends in geospatial information management: the five to ten

year vision' (2013) was also relevant. Besides determining the requirements for the different stakeholder groups, it was also important to explore the determination of the requirements of the perspective of public delivery service partnerships such as citizen to government (C2G), government to citizen (G2C) and citizen to citizen (C2C), but also government to government (G2G) and government to private organisations (G2B) (Saugata and Masud, 2007). Another relevant perspective was to look at the different stages of service delivery (design, execution, delivery, monitoring and evaluation) (Linders, 2012).

On the basis of the determined requirements for e-service delivery, key enablers were identified as factors enabling the achievement of these requirements. In this context, the enablers of COBIT framework were applied in a comprehensive and systematic way. COBIT stands for Control OBjectives for Information and related Technology. It is a framework created by Information Systems Audit and Control Association (ISACA) for information (technology) management and governance. This framework aims to research, develop, publish and promote authoritative, up-to-date, international set of generally accepted information (technology) control objectives for day-to-day use by business managers, IT professionals and insurance professionals (ISACA, 2012). The enablers of COBIT fit into the research framework of FLEXPUB as these enablers are based on the generic and holistic approach of COBIT to enable information and related technology to be managed for the entire organisation, taking in the full end-to-end business and functional areas of responsibility, and considering the related interests of internal and external stakeholders (Bernroider and Ivanov, 2011). In the context of this research, the entire organisation refers to the federal government and the business to e-service delivery. On the basis of the COBIT, the following (slightly modified) categories of enablers were investigated in detail: Policies and regulations; Processes; Organisational structures; Culture, ethics and behaviour; Information; Infrastructures (with associated architectures and standards); and People, skills and competencies. Each of these enablers will be introduced more in detail in Section 4.1.2. "COBIT Enablers". The research related to enabler "Policies and regulations" was strongly based on the legal framework as defined by Jansen (2009) and the activities of the European Union Location Framework (JRC, 2012). The research on the enabler "Processes" was based on Business Process Management (Dumas, 2013), Business Process Maturity (OMG, 2008), Enterprise Engineering (Op 't Land, Proper et al.) and Agile development. The associated research related to the enabler "Organisational structures" was strongly based on the governance mechanisms 'Hierarchy', 'Market', and 'Network' as described by Bouckaert et al. (2010). The Unified theory of Acceptance and Use of Technology (Venkatesh et al., 2003) and the Hofstede's cultural dimensions theory (Hofstede, 2011) were applied to investigate the enabler "Culture, ethics and behaviour". The research on the enabler "Information" is strongly based on the results of the Baseline measurement and the application of Actor Network theory (Latour, 2005). Research related to the enabler "Infrastructure" (with associated architectures and Standards) was partly based on COBIT 5 that provides infrastructure management and governance guidelines ensuring the quality of service delivery in terms of meeting the business goals, and to identify the associated responsibilities of business and IT owners (ISACA, 2012). Finally, the research on enabler "People, skills and competencies" links strongly to the work of Perry and Hondeghem (2008) – 'Motivation of public management, The Call of public service'. Most of the "enablers" research was achieved by studying relevant literature or policy documents, interviewing key stakeholders or (inter)nationally recognised experts, and analysing (inter)national practices.

The main research activity "e-Services", as presented in Figure 1 above, was about the validation of the "enablers" findings. This validation was based on a thorough and detailed analysis of selected number of case studies. In the context of this research, the case study refers to a specific geospatial e-service. Section 4.4 "Work Package 5 – Case Studies" presents the three case studies that have been selected, namely "BeSt Address", "Cadastral Information Exchange in Belgium" and "Emergency Services in Belgium". Since FLEXPUB aimed to investigate the changing phenomenon of e-service delivery in a certain setting, case study research was the most effective research strategy (Yin, 2003). In accordance with the Diverse case method of Seawright and Gerring (2008), multiple cases were studied, making the validation stronger. Each case was studied from an interdisciplinary perspective as described by (Dessers et al., 2014). The selection of the relevant case studies was based on the results of the baseline measurement, stakeholders studies, and the "enablers" research. Relevant criteria for selecting the cases were: the degree of usefulness for many federal administrations, the degree of e-service success (failed vs. successful), the e-service implementation (initial vs. full operation), and the degree of case similarity (very similar vs. different).

The research results of the previous activities provided the necessary input for the Federal Strategy for Flexible Geospatial e-Services. The Strategy clearly describes the Vision, Objectives, Key stakeholders, Benefits, Strategic areas, Strategic actions, Strategic priorities, Governance structure, Risks, Key performance indicators, and Roadmap. These are derived from the FLEXPUB research, from multiple discussions with the members of the Follow-Up Committee and from a review of a set of existing strategy documents focusing on the delivery of geospatial e-services, such as the ones of Denmark (Danish Ministry of Finance, 2012), The Netherlands (Geonovum, 2014), and USA (Federal Geographic Data Committee (2013). An Initial Draft Strategy was already formulated after two project years, focusing on the period 2018 – 2025. The Final Strategy was formulated at the end of the project with a longer period scope (2020-2030).

In addition, the research results of the previous activities also fed the Blueprint for an Adaptive and Innovative Government. The scope of this document is much wider than the Strategy for Flexible Geospatial e-Services, as it covers the issue of adaptation and innovation of the Government in its full extent. This Blueprint attempted to translate the outcomes of the Strategy for Flexible Geospatial e-Services into a document with a broader scope. This translation could only be achieved by clearly identifying the link between geospatial e-services and e-government (Crompvoets et al., 2010). This was done on the basis of relevant literature (Bekkers, 2009), interviewing (inter)nationally recognised experts, analysing relevant (inter)national practices and case studies.

Finally, the FLEXPUB toolkit contains useful tools derived from all of the above previous research activities.

To conclude, the reader wishing to obtain more information about the specific methodology used for each of the Work Packages can find it in the "Methodology" section of each of the Work Package reports.

4. SCIENTIFIC RESULTS AND RECOMMENDATIONS

After having presented the Methodology used for the research, the results and the recommendations made in each of the Work Packages will now be summarised (Sections 4.1 to 4.7). For more information on each of the Work Packages, the reader is invited to consult the different Work Package reports available here.

Moreover, a number of side results, e.g. research performed in the context of FLEXPUB but that was not required in the project proposal, were performed during the four years of the research. These are presented in Section 4.8. Finally, Section 4.9 is dedicated to Policy Support, and aims to describe the contribution that the FLEXPUB research project has made to the federal competences.

4.1. Work Package 2: Baseline Measurement

4.1.1. Research Approach

In order to fully understand the current 'as-is' situation and the 'day-to-day' challenges that the stakeholders face, the starting point of the FLEXPUB research project was the Work Package 2 Baseline measurement. The Baseline Measurement aimed to understand the current state-of-play concerning spatial data and e-services. Via this Baseline Measurement, the researchers provided an overview of the status of the management of geospatial e-services at the federal government, and of the key processes (projects) dealing with this type of services. In particular, the Baseline Measurement aimed to understand what the main geospatial e-services of the federal administration are. Furthermore, the key geospatial data sets were identified, with a focus on the relations between the different stakeholders involved in the exchange and production of those data sets. Also the key motivations for developing and using e-services were analysed and detected, as well as the relevant policies and regulations within the field of geospatial data and e-services. The results of this Baseline Measurement allowed the researchers to identify firstly the requirements. Those are the needs and challenges that the Belgian federal administration has, in order to be able to offer more flexible and innovative e-services, as well as the barriers that they face in doing so. The time period covered by this state-of-play is 2016-2017, i.e. the starting period of the research project.

4.1.2. COBIT Enablers

The data results were 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 below, it was decided to add two extra categories, namely 'General considerations' and 'Semantics', and to transform 'Information' into the more specific 'Location-based data'. The enablers are derived from the COBIT 5 framework and serve as the guiding principles throughout the entire FLEXPUB research project. ISACA (2012, p. 27) describes the different enablers in the following way:

- 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 enterprise".

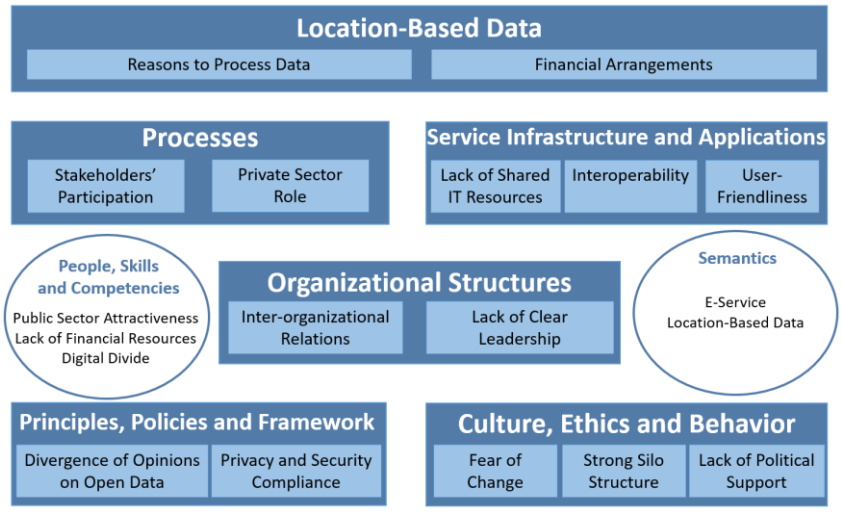
- Service infrastructure and applications "include the infrastructure, technology and applications that provide the enterprise with information technology processing and services".
- People, skills and competencies "are linked to people and are required for successful completion of all activities and for making correct decisions and taking corrective actions".
- Culture, ethics and behaviour "of individuals and of the enterprise are very often underestimated as a success factor in governance and management activities".
- Principles, policies and frameworks "are the vehicle 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 follows: "[It] is 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". It was decided however to specify this enabler. Instead of keeping the name 'Information', it was decided to refine it to 'Location-based data', as the focus of the research project lies on e-services that rely on geospatial data or location-based data. Two extra categories ('General considerations' and 'Semantics') were added to address respectively the information that could not be related to a specific category, and to analyse the data that is linked to the different definitions that are used in the field for the concepts 'Location-based data' and 'e-Services'.

4.1.3. Research Results

Via the Baseline Measurement, the researchers have concluded that the Belgian federal administration has taken actions to move forward on the path of digitalisation. There seems to be a willingness among the various stakeholders, both within the Belgian federal administration as among the other consulted stakeholders, to take the digitalisation of the public services even further. Nevertheless, strong challenges for the federal administration were identified. Based on the COBIT enabler a number of challenges were defined, as identified in Figure 2:

Figure 2: Challenges for the development of flexible and innovative geospatial e-services



Source: FLEXPUB (2017)

A. Processes

Stakeholders' participation in e-service development

Although it is recognised as a success factor in e-service design, public e-services are too often developed for internal use without consideration for external users (citizens, businesses, other public partners…). This leads to e-services being developed internally, and never being truly fully exploited afterwards. This participation is challenging because it is a time and money consuming process without clear methodology. The development process is already complex with different actors having conflicting goals (citizens that want a better service quality, IT managers that manage servers, Record managers that care about security of information, and other public servants that do not want too many changes in their workflow etc.). The inclusion of all stakeholders adds complexity to the process and makes the planning of the development process more difficult.

The inclusion of the stakeholders is also made more difficult by the very own nature of the administration and its hierarchical structure and the impact of the regulation on its existing processes. The work of incorporating feedback from stakeholders or the necessary signatures of the superiors leads to the risk that the software becomes obsolete if all stakeholders are involved. The particular challenge of finding users makes it even harder. Indeed, as the user group of the citizens potentially constitutes the whole population, there is a need for a multichannel methods to collect requirements. Different categories of stakeholders have different requirements and require different types of requirement collection methods (e.g. in case of earthquake, older generations might phone the authorities while the younger generation might simply post about it on Facebook or Twitter and it will be for the administration to go get the data actively).

Furthermore, there is also no clear responsibility about who should gather the requirements (between private or public sector, or between levels of power in Belgium). The last problematic aspect of participation resides in the changing political support. On the one hand, politicians push for increased citizen participation but, on the other hand, there seems to be a certain fear of citizens' feedback and how it may impact the existing or foreseen processes. The main challenge here is the reconciliation of the concept of representative democracy, in which politically elected actors steer the actions of the administrations – although it should be underlined that the administration has a level of independence of the political level – and the concept of direct democracy, in which citizens and other actors gain direct influence on the political and administrative level.

The survey led furthermore to a number of other relevant findings. In the first place it showed that 39,2% respondents stated that they apply agile software development methods to build their e-services. The most often used agile method is SCRUM. It does not come as a surprise, as it is one of the most widely adopted methods in public or private organisations. Interesting is the fact that no major findings could be retrieved concerning the relation between software development methods and stakeholder's participation methods.

Secondly, concerning stakeholder's participation the following results are also relevant: there is a strong will to reach a better service quality for users, to improve the effectiveness and output of e-services, and to increase the sense of involvement and trust of users. These two last objectives demonstrate a specificity of the public sector regarding citizen participation, which proves that the participation of users in the public sector is not completely similar to the user participation in

Information Systems in general. In the public sector, users are not merely seen as consumers of the e-services, but also as citizens having democratic rights that need to be taken into account. A last finding related to the stakeholder's participation shows that participation is performed for internal reasons instead of external ones.

Thirdly, the survey led to a number of relevant findings concerning stakeholder's participation. The results demonstrate that this happens at different stages of the development process. Participation most commonly happens in the requirement analysis and testing of the e-services (resulting in a list of stakeholder requirements). This requirement identification is thus often done through user involvement but also by making use of internal support or of a Service Integrator. The design and implementation stages are lower as they require advanced ICT skills. However, the maintenance stage (evaluation of the e-service) scores quite low and reveals a lack of user involvement for the long-term evaluation of services. Improvement could also be made in the project initiation stage (decision to develop an e-service).

Fourthly, regarding the specific methods of requirement identification, the results show that there is a clear distinction between traditional small-scale methods that are often used (interviews, group discussions, user workshops, prototyping) and more innovative large-scale methods that are rarely used (online surveys, platforms or social media). It is noticeable that Living Labs are neither largely used nor known although they could constitute innovation ecosystems that explore new concepts and ideas by involving government, businesses and citizens.

It can be concluded that the three main barriers for stakeholder's participation are the lack of capacity, financial resources and methodology. Regarding the difference between levels, it is noticeable that the Regions suffer the most from a lack of methodology, whereas the federal level suffers more from the lack of financial resources and capacity. For all categories of respondents, the number of respondents that ticked the category "I Don't Know" is rather high. This may suggest that administrations did not yet consider how to include users in the process, or did not consider the possibility for user's participation.

Divergences of opinions on private sector participation

This second challenge is linked to the potential role of the private sector within public processes. In the administrations, the potential private sector advantages (faster time-to-market, relevant knowledge and expertise) are acknowledged. This leads to the question on whether or not the public sector could apply private sector techniques to achieve those advantages. The research demonstrated that there are a number of respondents within the administration that fear the "public sector privatisation". Furthermore, the participation of the private sector is also challenging due to an investment issue. Indeed, public organisations do not always have the financial resources to hire private sector representatives. Finally, no standard contract exists within the public administration to deal with private sector actors and avoid possible problems (handling of personal data, or vendor lock-in, for instance).

B. Organisational structures

Inter-organisational relations between different administrative levels and at the same level

The first challenge focuses on the inter-organisational relations, and can be split in two categories. The first one pertains to the relations between different administrative levels and the second pertains to the inter-organisational relations at the same level. The inter-organisational relations

between different administrative levels seems to be challenging for organisations within one level, but also for the wider administrations – they function in partial isolation and focus on their own legally defined task and policy areas. It means that organisations have difficulties in coordinating their activities (in this case the development of geospatial e-services and the processing of geospatial data) between different levels.

Also within one administrative level, a need exists for stronger inter-organisational relations. At the federal level, a higher level of independence between the organisations seems to exist as a result of historical reasons. Some organisations with a vertical role at the federal level have much more resources than those that are required to exercise more horizontally related task. This leads to difficulties for the organisations with a horizontal role to execute their tasks.

An overall coordination structure for e-services and location-based data only seems to be partially in place at the federal level. There are indications, given to the researchers by the respondents, that a two-pillar system exists within the federal administration. The formerly existing FPS FEDICT was expected to take a leading role in the development of an overarching policy for e-services, but as understood from the interviews, the organisation lacked the necessary financial resources and political support. Furthermore, the important role of SMALS – mainly in the social security domain of the federal administration – made it difficult for the FPS FEDICT to establish a coordinating and key role at the federal level. As a result of this, this two-pillar system seems to have been institutionalised, as organisations seem to be more connected with one or the other organisation. It should however be underlined that SMALS has no formalised role within the federal administration, and whenever there is an influence of this organisation on the policy development process, it is in an informal way. There are also federal scientific organisations. The researchers were able to interview the Royal Observatory of Belgium as well as the Royal Meteorological Institute. From those interviews, it can be understood that those scientific institutions have inter-organisational coordination difficulties related to availability of resources. Those organisations do not always have sufficient means to organise the exchange of geospatial data or to make use of the services of the private sector. Moreover, the FPS FEDICT did not provide them with support in the development of an overarching geospatial e-service policy.

Looking at the regional administrations – those are mainly dealing with geospatial data – teaches us that there are strong differences in the coordination structures between them. Within the Flemish administration, a leading role is taken by the Agency Information Flanders (AIV). One of the respondents, from a different administration than AIV, underlined in this respect that AIV is well-respected as a result of its active and constructive role. Also the combination of geospatial data with the overall e-government policy is remarkable – but not an exception as can be seen from the Brussels Capital Region – in the Belgian context. In the Brussels Capital Region, the main role is taken by the Brussels Regional Informatics Centre (BRIC). Since the 1980's, it is responsible for coordinating both geospatial data and telecommunication developments. It is however mainly due to the INSPIRE Directive that a clear coordination has been developed for geospatial data, but coordination for e-services remains weak. Finally, the Walloon Region seems to have struggled with the development of a clear coordination structure for geospatial data and e-services, whereby different actors had (and still have) strongly related tasks which require sufficient coordination. Overall, also here there seems to be an effect of the INSPIRE Directive – which led to the establishment of a Walloon coordination structure for geospatial data. It should however be underlined that coordination remains a challenge.

Another element, recurrent within the federal and regional administrations, are the personal connections. Those seem to be at least as important as the official and formalised connections between organisations. Even though it is necessary to have coordination based on formalised connections between organisations, the personal connections often seem to be very important, and somehow leads to a breakdown of the silo culture (see below). Such a situation can however become highly problematic. When the personal connection is lost, the connection between two organisations, or parts of the organisations, is lost as well. In a worst case scenario, the dominance of personal relations over formalised and official relations creates the risk for personal conflicts that might inhibit the proper functioning of an organisation or parts of the organisations, and influence the related policy. In this regard, one of the respondents informed the researchers that data is sometimes exchanged without the formal consent of the hierarchical superior of the organisations, as this would lead to the involvement of the judicial team and create bureaucratic difficulties delaying the exchange of data and the overall policymaking process. The respondents recognised in this regard the problematic situation from a legal point of view, as these exchanges occur in a grey zone that could lead to serious issues.

Looking at inter-organisational relations between different administrative levels teaches us that coordination structures exist for various programs. Examples are the different cooperation committees for addresses, the cadastral information, e-government and the implementation of the INSPIRE Directive. It should however be underlined that the coordination that emerged out of the coordination agreements is often mainly used to share information and not so much for institutionalised cooperation. One of the main achievements in this regard seems to be the establishment of the Coordination Structure for Patrimonial Information (CSPI), an inter-federal organisation responsible for coordinating the sharing of patrimonial information in the inter-federal context. Furthermore, geospatial data is exchanged between organisations, but not via a coordinated governance structure. Instead, bilateral agreements are used.

Nevertheless, there is also some inspiring feedback from the questionnaire. The results indicate that both at regional and federal level, there is strong willingness to increase the cooperation between organisations, both at the same administrative level and between different administrative levels. Based on those rather positive results, the researchers argue that the problem is not so much the unwillingness to collaborate. It is rather based on the difficulties encountered due to the state structure, which has as consequence that different administrations are working on different policy domains or are working on different aspects of the policy cycle at the same moment, and might therefore have more difficulties to cooperate. Furthermore, this seems also to be related to the fact that different administrations are not all at the same state of progress when it comes to the development of geospatial e-services and have, overall, taken different perspectives on the future steps concerning the development of geospatial e-services and geospatial data.

Leadership for the digital agenda

Another challenge, linked to the inter-organisational relations, is the need for clear leadership for the digital agenda. This point is mainly, but not only, relevant at the federal level, where a two-pillar structure exists due to historical reasons (FPS FEDICT (today incorporated in DG Digital Transformation of the FPS BOSA) and SMALS). Although there is leadership, it is divided between organisations and there is – within the federal administration – no single overarching actor that is able to steer the direction of location-based data and/or e-service developments. Once again, the

researchers would like to emphasize that SMALS has, in comparison to the former FPS FEDICT, no formal role within the federal administration. An extra indication of this is the observation that there is no Chief Information / Interoperability Officer (CIO) at the federal level. This challenge is strongly linked to the third challenge of the enabler "Culture, ethics and behaviour", the lack of sufficient political support, but is however much more focused on the organisational needs than on the cultural needs. Indeed, political support is provided by the Minister responsible for the Digital Agenda (see enabler "Culture, ethics and behaviour"), but the competence of the Minister towards the digitalisation of the federal administration is shared with other Ministers. Indeed, digitalisation is a horizontal policy area which implies that other policy areas are also affected. This is the so-called matrix model chosen by the federal administration. As a result, this situation can be challenging on the road towards more uniformed leadership because these political deciders do not always pursue the same policies. From an administrative coordination leadership perspective, it can also be argued, as it was indicated by respondents, that the position of the formerly existing FPS FEDICT was different. FEDICT was a self-standing Federal Public Service, while the new organisation structure relating to digitalisation policy – the DG Digital Transformation – is included in a broader Federal Public Service. The respondents expressed concern about the DG's visibility. However, this integration into the multi-disciplinary FPS BOSA creates encouraging prospects for stronger collaboration, strategy and policy development.

Looking at the area of geospatial data teaches us that the NGI, which is – from an organisational point of view – the federal actor with a key role in geospatial data, is not the focal point for geospatial data. Indeed, at the federal level, there does not seem to be a "natural" leader concerning the topic of geospatial data (except for the FPS Finance in the field of cadastral information). Parallel to the lack of common acquisition of hardware and software in the next chapter, the NGI has taken up the role as purchasing centre for the federal administration of routing and traffic data, thereby saving the federal government as a whole on a yearly basis, several hundreds of thousands of euros on licence fees alone. Other advantages are that more organisations use the same dataset (facilitating better collaboration) and that organisations have more time to spend on other issues, as organising individual call for tenders is no longer necessary.

C. Service infrastructure and applications

Lack of shared hardware and software

This challenge expresses that there is a lack of common acquisition of software and hardware in Belgium. The main barrier for the acquisition of software comes from the different specificities of stakeholders. Indeed, the more you go to the business end of the infrastructure, the more difficult it is to mutualise software/licence due to specificities. Across different levels, this sharing is even more difficult as the investment and procurement cycle of the different levels is not the same. Finally, each level has also reached the "critical mass" where they have enough with their own volumes and do not need to coordinate with different budgets. However, this seems to be evolving as a result of the federal G-Cloud, which is expected to lead to an increase in the sharing of hardware and software. The sharing of infrastructure is furthermore intensified by increased financial concerns. The overall decrease in government budget also had (and still has) repercussions for the financial options related to e-services and is expected to lead to more sharing. Finally, the EU vision on re-use of building blocks to build e-service might also influence

this challenge – the former FPS FEDICT focused on the development of building blocks to develop future e-services.

Interoperability

This challenge expresses issues for the exchange of data between administrations. Due to the lack of implementation of technical standards, the data exchange is difficult and time-consuming for administrations. This low implementation is in part due to the lack of awareness about the existing technical standards. This lack of standardisation is also a result of the multi-governance structure of Belgium. There is no single actor that can impose such standards or practices across the different levels of power (e.g. a federal law would only apply to federal administrations and not to regional administrations). BeST-Address is a good example of this lack of standardisation due to the different data models of the three regions and the federal administration (see below Section 4.4.1.). Nevertheless, progress has been made in this area, and especially in the area of geospatial data. In light of the INSPIRE Directive (2007), EU Member States started to develop national geospatial portals and were obliged to define the metadata for a number of geospatial data categories. Also the European Interoperability Framework (EIF - adopted in 2010, revised and updated in 2017) led to an increased attention for interoperability. In this regard, it has to be mentioned that the federal administration via the former FPS FEDICT and the current FPS BOSA work on a National Interoperability Framework. The EIF approaches interoperability from different perspectives. Not only is there need for technical interoperability – which is even regarded as the last stage in developing interoperability – but even more so for legal, organisational and semantic interoperability. In the revised version of the EIF, an overall vertical element has been added, namely the need for an integrated public sector governance.

User-friendliness of e-services

The user-friendliness of e-services was identified by the respondents to the questionnaire as the priority for future e-service delivery. However, at this moment, it is still very volatile in function of the administration that offers it. Furthermore, from the citizens' perspective, there is a lack of an integrated "one-stop-shop" for e-services in Belgium. This single point of entry for citizens could result from a "soft" (via a portal) or "hard" integration (between systems). Due to interoperability issues between systems, a single portal for e-services (via MyBelgium for instance) is implemented. However, soft integration portals are not sufficient anymore, as citizens are expecting more individualised answers and services. It should nevertheless be acknowledged that part of the new FPS BOSA DG DTO's tasks is the need to focus more on the user-friendliness of e-services and to take, in general, a more user-centric approach. Furthermore, also at the Flemish level, the focus in delivering e-government and e-services is put on user-centricity (as well as on efficiency). However, the main difficulty of administrations – not only in Belgium, but also in a European and global context – is to transform from an inward-looking perspective to a more user-centric perspective and to define, depending on the role taken by the organisations, what it means to act in a user-centric way.

Innovation Status in Administrations

On a more general note, the respondents were asked to report on the status of the use of recent technological infrastructure within their organisation. Those types of infrastructure can be regarded as innovative tools. The most heavily used infrastructure is the service-oriented-architecture. This is quite logic due to the necessity of data and service exchange between

stakeholders at the same/different level(s) of power. Cloud Computing, the Life-event-approach and sensors were also well cited in the responses. The innovation paradigm with the lowest usage-level in the questionnaire was the micro-services. This confirms the lack of a building blocks' methodology in the administrations.

D. People, skills and competencies

Digital divide among citizens

This challenge 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 have personal contacts via visits to the administration. Moreover, a performant digital infrastructure is not everywhere and at any time available. 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. 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.

Furthermore, the researchers found out that the digital divide is not only a material problem pointing to users which 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 Report 2016 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 remains overall rather low.

Another, and final, 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.

Public sector attractiveness

This challenge 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 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. This can lead to unfortunate situations where administrations are unable to rollout their e-service projects due to a lack of sufficiently skilled personnel. An example of how to deal with such a situation is the structure taken by SMALS. Although the organisation legally belongs to the "public sector", it functions similarly to a private sector company from an economic perspective and therefore offers much more competing salaries and rewarding schemes to IT specialists.

Lack of financial resources

This challenge relates to the budgetary shortcomings that hamper the development of e-services. It is worth mentioning that while this challenge was often emphasised in the replies to the questionnaire, it was much less cited as an issue during the interviews. 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 demanded that the overall ICT budget would be decreased. 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, one 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 costs more money – especially in the first years, both because of the innovation aspect and the knowledge that projects can fail – which leads to a loss of money.

E. Culture, ethics and behaviour

Fear of change for impact of technologies

A first challenge to work on is the fear of change, due to the impact of technologies on the working environment and/or tasks within organisations. Staff working in an organisation can consider technology as problematic when the organisation does not sufficiently clarify the role of this technology. Therefore, it is important to include the organisation's staff in the development and maintenance of technology, such as e-services. This is not a finding that only counts for the federal administration as also other administrations – both in Belgium and abroad – as well as the private sector organisations face similar challenges.

Existing silo structure/culture

A second challenge that was identified is the silo culture that exists in the administration. Each organisation is focused on executing its own vision, developing its own policy and reaching its own goals. Although it could be argued that the federal political agreement between the government parties creates a common policy, this only partially seems to be the case. It creates an overall structure, but the policy development and implementation still needs to happen in the different organisations of the federal administration. Furthermore, this has also grown out of the historical independence of different organisations within one administration. Personal relations within one organisation and across organisations can also have an impact. As a result, organisations do not always look sufficiently at other organisations when developing e-services. Rather than learning from other organisations, there is a preference to focus on the own internal way of working and as a result it can block the further development of the interoperability. In this respect, the 'only once principle' is of crucial importance, as organisations and / or elements within one organisation need to re-use the data that is already known by the administration. This leads to the legal obligation of cooperation. It remains to be seen if it will be sufficient to bring down the silo culture as a whole, as it not only about sharing data within one administration, but also about developing and sharing e-services. This challenge is strongly related to the inter-organisational relations and the need for increased cooperation and guidance of it.

Lack of sufficient political support

A final and third challenge to work on is the lack of sufficient political support. Respondents indicated that there was, and sometimes is, a lack of sufficient long-term reflection on digitalisation, and that support is mainly focused on short term achievements. Looking specifically at location-based data, the baseline measurement indicated that there is a lack of sufficient focus

on this type of data, which can partially be explained by the difficulty to understand its added value for policy making and service delivery. Although politicians seem to understand the need to digitalise the administration – because it can create efficiency gains – the attention is only focused on digitalisation, e-government and the digital society in generic terms, and much less on the concrete development of an e-service policy that covers the entire administration. In this regard, it is promising to see that the FPS BOSA DG Digital Transformation is able to undertake policy development tasks and works in a strategic way towards the future development of a federal e-government approach and policy. An example of this is the contribution of the FPS BOSA DG DT to the Policy Note of the Minister responsible for the Digital Agenda.

The researchers would like to underline that in recent times (period 2017-2020) a number of concrete actions towards the end-users have been launched, with strong political support. One example of this is the "e-box initiative" (De Croo, 2017). One of the interviewed respondents made clear that the Minister or politician in charge needs to be able to win something, in a political or financial way. Furthermore, another respondent underlined that the development of e-services and e-government is not a goal in itself, and much more a tool to achieve something else. It is a transversal topic and there is a need to create an economic output via digitalisation. This last element can also explain the lack of concern for location-based data. It is an unknown topic, whereby politicians do not always grasp the added value of the data and how it can be used. Finally, some respondents pointed to the struggle between administrations and political cabinets. An example of this lack of sufficient political support is that the FPS FEDICT's role as a leader for the digital transformation at federal level was not sufficiently established on the long term.

F. Principles, policies and frameworks

Divergences of opinion on Open Data policies

It results from the interviews that the issue regarding Open Data is not the administration's unwillingness to share data, but rather the lack of financial means to do so. This is corroborated by the fact that a wide majority of the survey respondents either strongly agrees or agrees with the statements of the questionnaire according to which public sector information should be (freely) available for re-use. The financial implications of the implementation of a sound and comprehensive Open Data environment are indeed non-negligible.

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[1], 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

[1] 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. A recast version of this Directive was adopted in 2019: Directive 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information, OJ [2019] L 172/56. Art. 6.2.b is now Art. 6.2.a and Art. 6.2.c is now Art. 6.4.

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 even though.

Compliance with data protection and security rules[2]

This challenge focuses on the fact that the administrations will have to adapt to the rules contained in the EU General Data Protection Regulation[3] (GDPR) that is applicable since May 2018. In Belgium, the GDPR is complemented by a Law of 3 December 2017 creating the Data Protection Authority[4] and a Law of 30 July 2018 pertaining to the protection of natural persons regarding the processing of personal data.[5] This is seen as a major novelty for the administrations, who 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 Directive 95/46 that it will replace. 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 was abolished at the entry into force of the GDPR. 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 / by default processing. They will also have to appoint a Data Protection Officer (DPO). They will 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.

G. Semantics

E-services

A first element is the concept of *e-services*. During the interviews, it turned out that different organisations use different definitions of what an e-service means. For some organisations, it is a simple website, for others, it is an online process that allows users to handle their complete relation with the administration(s). As a result, organisations seem to miss the conceptual understanding of the meaning of an e-service. This is however a necessity for building a common e-service strategy.

The results of the survey show however that most respondents define a public e-service from a Government-to-Citizens (G2C) perspective or from a Government-to-Business (G2B) perspective.

[2] Note that the interviews and survey were conducted before the General Data Protection Regulation became applicable.

[3] 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).

[4] Loi du 3 décembre 2017 portant création de l'Autorité de protection des données, *M.B.*, 10 janvier 2018.

[5] Loi du 30 juillet 2018 relative à la protection des personnes physiques à l'égard des traitements de données à caractère personnel, *M.B.*, 5 septembre 2018.

Looking at the correlations between the different categories teaches us that G2C and G2B show a weak, but significant (at 0,01 level), correlation of 0,502. Also the categories Business-to-Government (B2G) and Government-to-Business (G2B) show a weak, but significant (at 0,01 level) correlation of 0,501. The strongest significant correlation was found between B2G and C2G. Those categories show a positive correlation of 0,794. Remarkably however, those are the categories with the lowest number of responses – except for the category Citizen-to-Citizen (C2C), which was only ticked by 35 respondents. The results are not surprising, and in line with the expectations. Indeed, most respondents see administrative actions towards non-government actors as e-services, while part of the respondents also consider actions from non-government actors to the administration as e-services. This is fully in line with the development of e-services.

Location-based data

Secondly, understanding the meaning of "geospatial data" or "location-based data" seems to be a complicating factor. Organisations that are dealing with location-based data on a regular to very regular basis are very well aware of the meaning and added value of this type of data. However, other organisations – which are also using location-based data, but not as their main product – have more difficulties in understanding the meaning of the concept, and therefore also of understanding the added value of this type of data for their services. This is unfortunate as the added value of location-based data does not only lie in making the data available so that it can be used in the specific context of geospatial activities, but even more so in policy domains that have until now not made use of the possibilities offered by adding location to the policy domain. Examples of this are the policy domains pertaining to health care or to the judiciary system.

A fairly simple definition of geospatial data has been provided in Art. 3 of the INSPIRE Directive. The directive defines it as "any data with a direct or indirect reference to a specific location or geographical area" (INSPIRE Directive, 2007, art. 3). The researchers used a very similar definition for the General Questionnaire, stating that spatial data is "all data linked to a location on the earth".

H. Location-based data

Besides an analysis of the challenges faced by the Belgian federal administration, the FLEXPUB project also analysed the data flows between the different stakeholders for a total of 20 different types of spatial data. The data obtained from the survey lead to a number of relevant results for the project. A first element to take out of this analysis was the limited role of the National Geographic Institute at the federal level. Even if, for a number of data types, the NGI played a dominating role, this was not so for many other types of location data. As the NGI presents itself as a geobroker, it was expected that a more prominent position of the organisation would emerge, at least at the federal level, especially concerning the gathering and redistribution of data, even when it does not produce the data itself. Secondly, a similar situation emerged at the Walloon level, where the SG – Geomatics Department was expected to play a dominant role, but seemed to have a very limited role in reality. Other organisations of the Walloon administration were more dominant – an example is the DG Agriculture, Natural Resources and Environment. A third overall conclusion was the strong presence of AIV, which produces, uses, and gathers information to distribute and redistribute it to other organisations at different levels. A fourth conclusion that could be drawn related to the connection between the federal administration and the regional administration. While in an ideal situation, such types of connections should be observed for all types of data, this was only the case for some data types, such as cadastral data or transportation

data. In this regard, it could be observed that there are more connections between the Walloon region and the federal administration, than between the Flemish region and the federal administration.

4.1.4. Report

A detailed overview of the Baseline Measurement can be found in the Work Package 2 'Baseline Measurement' Report published in 2017:

> Chantillon, M. Kruk, R.W., Simonofski, A., Tombal, T., Crompvoets, J., de Terwangne, C., Habra, N., Snoeck, M., & Vanderose, B. (2017). *FLEXPUB Public e-Service Strategy - Work package 2 - Baseline Measurement*. Leuven: KU Leuven Public Governance Institute.

This Report can be consulted via the following link.

4.2. Work Package 3: Requirements for e-Service Delivery

4.2.1. Research Approach

WP 3 aims 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 time line and to focus on the future. The team was able to gather, for each of the enablers, a number of requirements. Those requirements are, together with the identified results of WP 2, used as basis for the following WPs.

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 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. Hereunder some specific information can be found on the focus groups organised for each enabler.

Processes: Due to the higher requirements of citizens and the collaboration environment in government, traditional 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 all belonged to the federal administration.

People, skills & competences: One focus group was organised with civil servants of the Federal and Walloon 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 the topic of Open Data. 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 Walloon 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 & behaviour: One focus group was organised on this topic, whereby the four participants were 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. Indeed, a focus group was originally organised, but as a number of participants cancelled their participation and it was too late to contact the only remaining participant, 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 organisation. The second focus-group was held in March 2018 with representatives from the local government, the federal administration and the three regions.

The data gathered via the focus groups was coded afterwards. First, all focus groups 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, and, depending on the enabler, brought together representatives from the different stakeholders' groups (federal administration,

Flemish regional administration, Walloon regional administration, Brussels regional administration, provincial administrations, local administrations or the private sector).

4.2.2. Research Results

A number of requirements have been defined in the focus groups and are structured around the COBIT enablers. They dig further into the challenges of WP2 and focus on the needs that emerge from these challenges from key stakeholders in the federal administration.

A. 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.

The elicited requirements are summarised as follows: Investing in internal competences; Need for increased user participation; Better internal stakeholder alignment; Need for incentives to go agile; Integration of the impact of regulations; Flattening the Hierarchical structure; Lack of Resource Management; Tackling the Domain Complexity.

B. 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 appears from the analysis that there is preference 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.

The elicited requirements are summarised as follows: Balancing a common approach and organisational independence; Organisational aspects of (geo) data sharing (Sharing platform for (geo) data, Increased attention for authoritative data sources, Standardisation and the importance of a clearing house); Need for administrative reorganisation; Need for administrative simplification; Need for internal organisation coordination; Need for long-term political support for coordination; Improve relation between federal administration and regional administration.

C. 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.

The elicited requirements are summarised as follows: Increase the capability to innovate; Take into account privacy concerns; Develop systems with a focus on user-centricity.

D. People, skills and competencies

For this COBIT enabler, three requirements have been identified in the focus groups. The digital divide forces administrations to 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. Another requirement deals with the public sector attractiveness, as 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. The last requirement relates to the budgetary shortcomings that hamper the development of e-services.

The elicited requirements are summarised as follows: Tackle the digital divide among citizens; Understand and increase the public sector attractiveness**;** Need for sufficient (financial) resources of public administrations.

E. 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 then 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 and its organisations, and in 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 behaviour 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 it is so time consuming can however lead to a lack of attention and/or willingness to invest in it.

The elicited requirements are summarised as follows: Understand the impact of technologies on working environment; Creation of a sustainable organisational & project network; Creation of network for political support.

F. Principles, policies and frameworks

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. The first requirement aims at understanding the causes behind the administration's reluctance to engage in open data. The second 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.

The elicited requirements are summarised as follows: Understand the divergences of opinion on Open Data policies; Stimulate compliance with data protection and security rules.

G. 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 – according to the focus groups on geodata – by the paradigm shift 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.

The elicited requirements are summarised as follows: Understanding of concepts of location-based data and e-services; Exploration and communication on value of location based-data.

H. Location-based data

In order to understand the requirements for location-based data in a multi-level government context, various themes were discussed and the elicited requirements are summarised as follows: Need for coordination for location-based data exchange, 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.

I. Research questions

These requirements were then translated into research questions to guide the continuation of the FLEXPUB project.

- 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 constructed 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 behaviour:** 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?

4.2.3. Report

A detailed overview of the Baseline Measurement can be found in the Work Package 3 "Requirements for e-Service Delivery" Report published in 2018:

> Chantillon, M. Kruk, R., Simonofski, A., Tombal, T., Crompvoets, J., de Terwangne, C., Habra, N., Snoeck, M., & Vanderose, B. (2017). *FLEXPUB Public e-Service Strategy - Work package 3 – Requirements Identification*. Leuven: KU Leuven Public Governance Institute.

The report can be found at this link.

4.3. Work Package 4: Enablers

This Work Package (WP 4) deals with the identification of requirements concerning the enablers – which are factors that, individually and collectively, influence whether the requirements for e-service delivery can be achieved. In the context of this research, it refers to the impacts of the changing requirements for e-service delivery on the relevant enablers. This WP is the result of an ongoing research that started at the beginning of the FLEXPUB research project in 2016. The seven COBIT enablers are used as a means to assess the impacts of the changing requirements for the implementation of future public e-services. The results of WP 2 Baseline Measurement and WP 3 Requirements has strongly influenced the direction of this WP 4. On the basis of the needs and requirements collected from the respondents, the research team has produced an overview of good practices and possible solutions and/or contributions to deal with the identified needs and requirements.

In line with the previous reports, and research findings, it was decided to change the conceptual meaning of the enabler 5 "Information" to "Location-based data". Indeed, FLEXPUB is focused on the development of flexible and innovative geospatial e-services. The information can therefore be labelled in a more specific way as location-based data. For each of these enablers, the research team investigated what the requirements are to achieve both flexibility and innovation capability of the federal government. On the basis of a comprehensive cross-check of the enablers, possible policy options for enhanced flexible and innovative e-service delivery are listed and formulated. This final aspect makes also the connection to the WP 6 Strategy and WP 7 Blueprint. Indeed, the formulated policy options also come back in the Strategy and Blueprint.

Regarding the methodological approach, This Work Package was executed on the basis of a multi-method approach, whereby the starting point was the outcome of WP2 Baseline Measurement and WP3 Requirements. Indeed, for each of the enablers, a number of needs and requirements were formulated in WP2 and WP3. In this WP4, we aimed to find possible approaches to deal

with the identified needs and requirements. It has to be underlined that since the research was organised independently for each of the seven enablers, there is only a minor overarching research approach for this WP. The research for each of the enablers is based on in-depth interviews, a general questionnaire, a citizen questionnaire, focus groups, an international practice comparison, a literature review of (scientific) documents, a document analysis, or on a combination of those research methods. All those different approaches have contributed to the identification of good practices and possible solutions and/or contributions to deal with the identified needs and requirements.

This interdisciplinary analysis integrated different views (Law; Business engineering; Public administration; Geo-spatial knowledge) and matches the seven COBIT enabler used for WP 2 and 3. It should, however, be underlined that each team member worked on a number of specific enablers. Therefore, the focus of this research was more specific and individualised. Nevertheless, the identified good practices and possible solutions and/or contributions to deal with the identified needs and requirements have been cross-checked by all team members. An overview of the methodological approach that was followed for each of the different enablers can be found in the Work Package 4 Report.

4.3.1. Principles, policies and frameworks

Among the two requirements identified in the Work Package 3 Report, it was decided to focus more deeply on "Open Data", as the team's expertise was the strongest for this requirement and this is where it could be the most influential. However, some enablers are also provided regarding the "Personal data protection" requirement. Moreover, the use of digital-ready legislation as an enabler for efficient public service delivery (Danish initiative) is also presented.

A. Open data

These enablers have been identified thanks to two focus groups. Moreover, some additional insights have been gathered during a workshop organised by the team on the 26th of September 2019 ("Revision of the PSI & Open Data Directive – What impact for your administration?"), which gathered around 50 civil servants from the Federal and Regional levels. Tools to raise awareness about the benefits of Open Data were notably discussed during this workshop.

Administrations need to foresee sustainable "Open Data funding" in order to ensure the quality, the continuity and the maintenance of the opened data. This sustainable funding could be done in two different ways, namely via a global budgetary envelope, which would cover the costs of all the open data policies of the administration, or via the creation of "Freemium models". Under this second model, public data is shared freely, but the administration could sell services built on top of this data to third parties.

A key enabler for the good roll out of Open Data policies is thus to launch awareness-raising campaigns about the benefits of Open Data in the administration. Indeed, if the civil servants saw the benefits of their work on Open Data, and not just the time and money spent on it, they would be more motivated and this would increase adherence, by the administrations, to the "Open Data mentality". One way to enable this awareness raising is to facilitate the administrations' ability to track the data re-use, in order to shine some light on "Re-use success stories". This would allow the administrations to give positive feedback not only to their civil servants (which would enhance their motivation to keep working on Open Data policies), but also to the political deciders (notably in order to justify the switch to a global budgetary envelope model). A second way to do

this would be to offer "Re-use awards" every year to the best "Re-use success stories" that have been reported on the platform. Indeed, this would incentivise re-users to inform the administrations about their re-uses, and this would provide more visibility to the administrations on what is done with the opened data. A third way would be to collaborate with the academic sector. For example, Master students in computer science, mathematics and business of the University of Namur were asked, in the context of a class, to create a prototype App on the basis of the Open Data from the city of Namur, Paris or London. Similar comparable initiatives, such as hackathons, could also be organised. A fourth way would be to create more user-friendly open data portals. Indeed, by making them more usable, this stimulates their use by non-experts. In turn, this motivates the civil servants as they realise that Open Data doesn't only benefit tech-savvy people, but also the common citizen. A last way would be to create an ecosystem where public-private-partnerships (PPPs) are entered into in order for re-users to increase this quality and up-to-dateness of public data not only for their own benefit, but also for the benefit of the administrations.

Finally, in order to enable re-users to combine data held by administrations of different levels of power, the administrations should strive towards harmonising the various "data re-use licences", in order to avoid licensing incompatibilities' issue. One enabler would be to develop a common licence (for all the levels of power) which would replace the current licence fragmentation.

As the FLEXPUB project focusses on location-based data, the large majority of which fall under the scope of the INSPIRE Directive, the team recommends that this discussion should occur within the Belgian INSPIRE Committee. In any case, the standard for such licence should be based on European standards, namely the CC-BY or the CC0 Creative Commons licence.

B. Personal data protection

A key enabler for a flexible and innovative government is taking personal data protection and security concerns into consideration from the start when designing public e-services (privacy-by-design) and implementing appropriate technical and organisational measures for ensuring that, by default, only personal data which are necessary for each specific purpose of the processing are processed (privacy by-default).

C. Use of Digital-ready legislation

The legislator rarely incorporates digitisation and technical implementation in the preparation of the legislation, while this is highly beneficial in order to create innovative and flexible e-services. Accordingly, taking inspiration from what is done abroad in this regard could enable such a positive evolution. More precisely, Belgium could enable more innovative and flexible e-services by replicating Denmark's initiative pertaining to "Digital-ready legislation". The goal of this initiative is to "ensure a simpler, clearer legal framework which is easy to understand and translate into secure and user-friendly digital solutions. [It] describes the new requirements to be fulfilled by the ministries in connection with the preparation of new legislation in order to support digital-ready legislation" (Danish Ministry of Finance - Agency for Digitalisation, n.d., 2018). Such digital-ready legislation should create the basis for more up-to-dateness and contribute to a more user-friendly, easily accessible and transparent public sector, in order to ensure a more modern and effective public service (Danish Ministry of Finance - Agency for Digitalisation, 2018).

4.3.2. Processes

Among the requirements identified in the Work Package 3 Report, it was decided to focus more deeply on "Stakeholder Participation", as the team's expertise was the strongest for this requirement and this is where it could be the most influential. First, it was necessary to understand which participation methods are possible to develop e-services. Then, the preference and barriers of stakeholders related to these methods and to user participation were discussed. Finally, recommendations were issued.

A. Participation methods

By performing a literature review, we were able to identify a set of eight participation methods: interviews/group discussions; representation in a team project; user workshops; answer to surveys; dedicated software; social media channels; living labs; and usability tests on prototypes. Each of these methods provides means to realise participation, but the influence of the citizens will be different depending on the context of the specific participation school it is implemented in. The three identified participation schools are the following:

- "Participatory Design" advocates an approach where good ideas are as likely to come from the user groups than from the decision-makers;
- "User-Centred" Design emerged in the human-computer interaction field and underlines the important impact of user needs on the design of the interface;
- "User Innovation" is the extreme counterpart of non-participation where the problem identification and design solutions emerge directly from the user, or more specifically from the "lead users" group.

B. Citizens' preferences and use in practice

Our research showed that there is a clear distinction between traditional small-scale methods that are often used (interviews, group discussions, user workshops, prototyping) and more innovative large-scale methods that are rarely used (online surveys, platforms or social media). It is noticeable that Living Labs are neither largely used nor known amongst the public servants. Furthermore, it must be noted that no major differences concerning the methods used were found between governance levels. However, there is a clear discrepancy between the methods currently used and the methods preferred by citizens. Citizens tend to prefer large-scale online methods (Dedicated Software, Surveys, Social Media) rather than traditional direct methods currently applied (Focus Groups, Representation in Project team, Interviews). During the interviews, several public agents made clear that there is an interest in those large-scale methods such as dedicated software. However, several public administrations indicated that they are active on social media, but mainly to share information and only to a limited extend.

C. Recommendations

The results above provide evidence for the discrepancies between the methods applied by public servants and the ones that are preferred by citizens. Accordingly, WP 4 provides several recommendations to be taken into account by practitioners or researchers to manage these discrepancies:

- *Medium Use / High Preference*: Use the method more extensively. These methods are used by practitioners and well-accepted by citizens. We thus suggest to use these methods

more extensively. Good practices for these more traditional methods can be found in the traditional user participation field.

- *High Use / Low Preference*: Improve the method. These methods are extensively used in practice but score a relatively low preference for citizens. We suggest not to drop these methods (as good practices are already well-established in practice) but research should be performed to understand why citizens do not like these methods. In that regard, research on the motivation and drivers of citizens should be undertaken.
- *Low use / High Preference*: Research the method. The citizens would like to co-create through these methods. Unfortunately, they are not used in practice. These more innovative methods call for research in pilot projects to be undertaken in order to establish a clear methodology integrating these methods.
- *Low use / Low Preference*: Use in specific cases. These methods are rarely used and are not preferred by citizens. Instead of dropping these methods, we suggest to consider them for specific cases (e.g. for lead users or highly motivated citizens). These methods indeed call for an important citizen commitment that could deliver high value but only if the right profile participate. The identification of these lead users in the population for e-government services should be in the research agenda for further studies.

Finally, the team suggested a participation method matrix where we formulate a hypothesis about the potential relevance of participation methods in each of the four steps of the e-Government implementation process (Strategy formulation; Process rationalisation; Development; Improvement). This matrix was applied to the city of La Louvière as a test case. More information about this case can be found in Chapter 4 of the Work Package 4 Report.

4.3.3. Organisational structures

Among the seven requirements identified in the Work Package 3 Report, it was decided to address five of them, namely "Application of coordination instruments", "Common vision development", "Geospatial data sharing organisational aspects", "Reorganisation of the federal administration" and "Collaboration of Belgian administrations", as the team's expertise was the strongest for these requirements, and this is where it could be the most influential.

A. Coordination literature

A review of the coordination literature has been performed, and allowed us to gain a structured view on the different approaches that are available for public administrations to coordinate their activities. Three general coordination approaches are distinguished in the academic literature: hierarchy-related coordination, market-related coordination and network-related coordination (Meuleman, 2008; Bouckaert et al., 2010). Each of those coordination approaches can be related to a number of coordination instruments. Those coordination instruments are available to public administrations for the coordination of their activities. The instruments are classified as management instruments and structural instruments, whereby for both classes of instruments, hierarchy, market and network related instruments are available. Management instruments refer to the approach that is applied for leading the cooperation between organisations. Structural instruments refer to the modification of organisations or the creation of other structures to create cooperation between organisations. Structural instruments impact the organisational structures, whereas the management instruments only impact those functioning in the organisational structures and not the organisational structures themselves.

On the basis of this coordination instruments' theoretical framework, research was conducted to understand how the use of coordination instruments can enable the different requirements outlined in the Work Package 3 report. The different requirements demonstrate that there are two particular needs. A first requirement is the need for an increased federal coordination, and a second one is related to the inter-federal coordination. Enablers are described below for those two requirements. The above described coordination instruments can be used to theorise the enablers.

B. Increased Federal coordination

Concerning the federal administration, it is important to find a balance between a continuity of the existing organisational structures and the improved coordination. This is necessary (1) to ensure that the existing service delivery is not endangered and (2) to ensure that the staff of the federal administration accepts the suggested modifications. In order to study this enabler, and in line with the following enablers, an international practice comparison has been executed as well as two focus groups. The results of these focus groups have also been discussed in the WP3 Report on the Requirements, and were therefore not discussed in the same detail as the results of the international practice comparison. In the international practice comparison, we focused on the European Commission eGovernment Benchmarking. The added value of this benchmarking is the fact that the results are highly comparable. It also needs to be underlined that the EU countries have similar levels of development and are confronted with similar – digital and non-digital – challenges. In this respect, the approach in which they organise the coordination within one public administration is highly relevant for any other public administration, such as the Belgian federal administration. More information about this international practice comparison and the enablers that derived from the focus groups ("Developing a common approach", "Stimulating (geospatial) data sharing" and "Updating the geospatial organisational structures") can be found in Chapter 5 of the Work Package 4 Report.

C. Inter-federal coordination

Looking at the inter-federal coordination, it is important to underline that the possibilities to intensify the coordination between the various public administrations[6] can only be increased via network-related structural and management instruments. Indeed, as the Belgian federal system is built on equality between the different public administrations, meaning that there is no hierarchical relation between them, the coordination needs to be organised via network-related instruments. This also means that the public administrations working on coordination need to see an added value for themselves. If they are not able to detect added value in the long, middle or short term, there can be no coordination among them. Once again, in order to study this enabler, an international practice comparison has been executed. Indeed, although the federal approach taken in Belgium is highly specific, there are a number of international practices which can be classified as network instruments that can also be useful in the Belgian context, because other countries, which have centralised state structures, also apply a combination of hierarchy and network related instruments. The application of network instruments requires more time, but will also lead to an understanding among the different involved actors that is more widely accepted

[6] The public administrations that the researchers refer to here are the federal public administration and the three regional public administration (i.e. Brussels Capital Region Administration, Walloon Administration and Flemish Administration). The three language-community public administrations are not taken into account here, as their competencies concerning geospatial information are highly limited.

by the involved actors. Hierarchy, as applied by Germany, can in this situation ensure that an agreement can be reached and that the agreed decision is also implemented. Besides the international comparison, a study on the functioning of the EU was also deemed useful to understand the potential coordination within the Belgian federal administration. This is because the way in which EU Member States collaborate is deemed relevant for the way in which the different Belgian public administration can coordinate their work. Finally, it was outlined that, during the focus groups, it became clear that, for various participants, there is a need to install a hierarchical relationship in the Belgian federal state structure. However, given the Belgian federal constitution, the installation of a hierarchical relationship is not possible and the enablers take this limitation into account. More information on all of the above can be found in Chapter 5 of the Work Package 4 Report.

D. Increased information sharing

The researchers also studied the specific topic of information sharing in greater detail. To gain a deeper understanding of how the information sharing activities are organised in the Belgian context, and in particular at the federal level, a document analysis was executed. The focus of the study was put on the effect of the EU on the information sharing within the Belgian context. The results of the analysis show that the Belgian federal administration was already actively working on information sharing since the 1980's and 1990's, and further intensified this in the 21st century. The actions taken by the European Union to stimulate information sharing within and across public administrations have, however, clearly impacted the Belgian federal administration. The EU actions have been a necessary factor to stimulate the Belgian federal administration to go further in its policy. This shows how important the EU actions have been, and it is expected that the EU influence has not only been present in the area of information sharing, but also in other specific e-government domains, such as the Belgian Open data policies. As such, the EU, and more particularly the actions taken by the EU, are an important enabler for the achievement of specific requirements. In this case, it was an important enabler for a stronger information sharing within and among public administrations.

4.3.4. Culture, ethics and behaviour

As the number of identified requirements of WP3 for this enabler were manageable, it was decided to focus on all requirements. In particular, an overarching research was conducted on the importance of public values and the public values' balance. Understanding these public values is not only important at the federal strategic level, but also within the different federal organisations, at the strategy and project level. An international practice comparison has been executed to identify good practices, as well as a focus group and an interview. On the basis of these three tools, a number of enablers have been identified. These are presented below.

A. Developing a Federal vision

Firstly, it was suggested to develop a common shared vision on the federal administration, so that the civil servants can subscribe to this federal vision, and that a common culture can be established. The Belgian federal administration already has a strategy, i.e. Digital Belgium, but a digital public administration is only one part of it and it remains unclear how the five priorities that are part of the digital government objective will be achieved. Moreover, the role of the different federal organisations in this strategy has not been developed. Therefore, it is important that the various federal organisations define together what their vision and strategy is for the digital

public administration. This enabler is strongly aligned with the COBIT-enabler "Organisational Structures". Indeed, it will be necessary for the FPS BOSA to define together with the different federal organisations what this vision and strategy will be. In order to ensure that it is widely approved and known, a political approval of this vision and strategy will also be a requirement.

B. Setting an inclusive organisational vision development process

Secondly, it was suggested that the federal organisations should develop an internal vision and strategy. It was suggested to increase the participation level of staff in the preparation of the organisational vision, thereby respecting the position of the top management. This should not focus on providing input for the vision, but rather on explaining why certain decisions related to the vision are taken. Furthermore – and it has to be recognised that 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

C. Acquiring digital skills

Thirdly, an organisational culture development plan should be set up, which can also help other organisations to deal with culture, and specifically culture change. It can include actions to be taken regarding the behaviour of staff members, as not all of them have the required digital skills. It is also possible to include a section 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. 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. Accordingly, the development of a concrete change management approach at organisational level is required, as well as guidelines from a horizontal and/or central body.

D. Understanding the public values' balance

In depth research was also conducted on the role of public values in an organisation. Public values and e-government policies are strongly related, and a change of the public values can be expected as a consequence of the e-government policies. This can also impact the relation between the staff of an organisation and the public values that are followed in the e-government policy of an organisation. In particular, three research activities were conducted. First, a systematic literature review was executed to gain a deeper understanding of the current status of the academic literature concerning the topic of public values. Second, a documents' analysis was executed, whereby the focus was put on the importance of public values in strategic e-government policy documents. Third, four case studies were conducted via interviews to understand the role of public values in e-government projects. As such, three areas were covered, the academic literature, the strategic level within a public administration and the project level within an administration. The results demonstrate that understanding the public values of individuals, teams, departments and organisations is of high importance to align the different approaches that

are followed. Therefore, it can be argued that understanding the public values is an important enabler to deal with the above-mentioned requirements.

It can be concluded from the literature review that the relationship between e-government and public values is only weakly developed. The public values' perspective is mainly used as starting point, but without a clear introduction or clarification of their meaning, and the authors often do not continue to use the concept in their paper or for the argument that they aim to make. Moreover, the overall academic attention and focus on the relation between e-government and public values is highly limited. Regarding the documents' analysis, and as outlined in (Chantillon et al., 2020), the results show that market related public values often play a dominant role in e-government policy documents, but so do – to a lesser degree – network related public values. Hierarchy related public values are seldom dominant. At the national level, four factors explain the prioritisation: (i) the attention for a specific governance approach at a given time; (ii) the influence of politics; (iii) the specific topic of the e-government policy document; and (vi) the role of authors. Moreover, power distribution at the EU level plays a key role in defining the public values balance. Finally, as outlined in (Simonofski et al., 2020), the case studies showed that the public values can be classified in three clusters, namely better services, better relationship and better democratic quality. The results show that the achievement of a better relationship was the most important, followed immediately by better services. A better democratic quality was only of minor importance, compared to the other two public values' clusters. However, none of the public values' cluster has a share of more than 50%. Finally, connecting those public values' clusters to specific user participation methods teaches us that these participation methods can be connected to specific public values. It is thus important for those starting to work on (or already working on) a participation project to understand that public values are important in this context. Not only will it help them to understand what type of participation methods are relevant, but it will also help them to internally – i.e. in the project – define what the public values are that need to be followed by the different project participants. More information on these results can be found in Chapter 6 of the Work Package 4 Report.

4.3.5. Infrastructure

Out of the three main requirements identified in the Work Package 3 Report, we have decided to focus on the "Capability to innovate", and more specifically on the enterprise architecture to enable it, taking into account transversal security issues and having user-centricity as key feature. In order to answer the defined research questions, we performed an international comparison of architectures in well-established e-government countries. This comparison enables us to give recommendations for an optimal technical ecosystem for Belgium.

A. International comparison of architectures

We compared Belgium with Estonia and the Republic of Korea following three main axes: the "Service Oriented Architecture" (SOA), the Cloud Computing usage and the general IT environment & E-Government 2.0. The first axis is separated into three categories: general SOA criteria, "Enterprise Service Bus" (ESB) and Micro-services. The second axis is about the Cloud technology and is separated in six categories. The first category is Cloud characteristics. The second category is about the reasons of using the Cloud technology with the strengths and weaknesses of such a technology in the context of the country. The third category is about Cloud Security. The fourth category gives the percentages of Cloudification (services to the Cloud) and the percentage of financing capacity to see what part of the budget is dedicated to it. The fifth

category is about the service models to see if a country uses SaaS, PaaS and/or IaaS. The sixth category points out the possibility of growth of the Cloud technology and checks potential inhibitors. The third axis focusses on the E-Government 2.0 giving information about the general IT environment. The different indicators are: the presence of a CIO in the country; the percentage of internet users; the apparition of the first portal; and the percentage of official votes through the internet. We also looked for the presence of a one-stop website for the citizens to see if they can easily access information and/or services and finally, if there is a portal allowing the citizen to give his/her opinion thus, allowing both the government and the citizen to interact.

B. Technical ecosystem suggestion for Belgium

We developed a 3-layer proposition for an optimal technical ecosystem in Belgium. Our propositions for the Belgian case are based on a technological and a best-practice level. The First stage concerns the harmonisation of the ICT environment, as it is one of the biggest challenges of the country. Then, the second stage is about Digitalisation in order to enable the citizen to tender legal document through the web. Finally, the third stage is about the participation of the citizen, to allow interaction with the government and citizen-based solution.

The purpose of the first layer is to harmonise the Belgian ICT environment in order to increase the manageability of the different services. It is composed of four different blocks:

- *Information about how the government works*: The first and most important step would be to make available all the information about the interaction between the services in order to be sure that any developer, employee or citizen has the possibility to learn how the whole system works.
- *Standardisation of the Documentation*: The standardisation of the documentation of the different services, applications and tools in order to clear the whole SOA environment will allow the employees to understand more easily the documentations of the different services that he/she has to work with. It will also help to prepare the environment for further upgrades.
- *Centralisation of the Documentation*: The biggest problem when the services interact with each other is that they have no centralised and up-to-date information about the other services. So, when a service is created or updated, it might have an effect on the other services that need to interact with it. The solution is to create a Business Process System (BPS) similar to the Korean on-Nara BPS in order to allow every service to read/upload/modify documentation about the different processes of the government (e-)services.
- *Fusion of bottom-node Data Centres*: In Belgium, there are many Data Centres inducing useless multiplied maintenance costs and security concerns. Therefore, to reduce the costs, data centres on bottom-nodes only used by smaller instances of the government should regroup in small groups inside bigger-instances of the same competencies.

The second layer, composed of three blocks, is about the Digitalisation of the different services:

- *Development of REST APIs*: After documenting and standardising the different services, applications, tools and their documentation, and uploading it on the centralised BPS, we can go further to facilitate even more the apparition of new services in the system by upgrading the architecture to a REST architecture.

- *Cloudification of the services and the data*: This will allow the e-services to be used by any authorised party around the world, facilitating the reutilisation of the already-developed e-services.
- *Clear and complete one-stop shopping for citizen*: The current website of official information offers a lot of information about the different processes in the different matters such as taxes, work or education but there are no legal forms, which are managed by smaller instances than the federal level. Those different forms are defined by the different administrations and should be standardised in order to better serve the citizens. The federal government should create canvases that administrations will reuse while making it available through the web to have the possibility to tender official documents online when those only need citizen-based information.

The third and last layer is about the citizen's participation and interaction with the government:

- *Microservices development*: This is the logical next step of standardising, Cloudifying and documenting the e-services. The creation of a toolbox, with not only complete solutions at disposal but also pieces of solutions, will drastically decrease the need to fully develop new solutions. The toolbox will rely on the Micro-services principle we described in our literature review.
- *Optimisation of the Cloud infrastructure*: After the Cloudification and documentation of the different services and their datacentres, an optimisation calculation can be done while respecting the legal texts, in order to find an optimal configuration.
- *Interaction and online voting*: Using the standardised back-end tools, the development of a front-end tool for the citizen is facilitated. This platform will enable constructive debates about decisions using complete information in order to add value to the decision or to the solution itself by modifying it.

4.3.6. People, skills and competencies

Among the three requirements identified in the Work Package 3 Report, it was decided to focus more deeply on the "Public sector attractiveness", as the team's expertise was the strongest for this requirement and this is where it could be the most influential. However, some enablers are also provided regarding the "Digital divide" requirement. As the team does not have any impact on the budgetary choices of the governments, no enabler can be suggested for the last requirement "Lack of financial resources".

A. Digital divide among citizens

The development of innovative and efficient e-services by public administrations presents challenges in terms of digital skills. Administrations must cope with the digital divide among citizens. Indeed, while some citizens expect administrations to be innovative and to follow the wave of the new technologies, others prefer to function the "old way" and to have personal contacts via visits to the administration. Several leads for solutions exist to tackle this digital divide issue.

Firstly, according to the recent scientific literature, it appears that, in developed countries, the digital divide is an issue of lack of digital skills, rather than an issue of lack of access to technology. It is therefore necessary to improve data literacy to provide people with the necessary skills to

interpret and use data. Secondly, one-stop shops (OSS) can be created, where citizens or entrepreneurs can initiate, process and complete an administrative request in one single building or webpage, with the help of trained supporting staff who can guide the users through the process. Additionally to these OSS, "Public Internet Access Points" (PIAPs) can also be created. They can be established, in regions with poor communication infrastructure, in frequently visited institutions within rural areas, such as schools, libraries and community centres. Thirdly, strong "once-only" policies, by which citizens and businesses supply information to a public administration only once, can be implemented. Indeed, by minimising the need for interaction, administrations can reduce the burden on citizens and companies. This requires a robust legal framework, to define which entities are the authentic sources of data, and which entities can access it. This "only-once" principle also optimises e-Service delivery, as it allows to prefill administrative forms via the exchange of information across administrations. In Belgium, for instance, part of the online tax form provided by the FPS Finance is already prefilled. Moreover, federal public administrations are subject to the "once-only" data collection law[7], according to which data should only be collected once from the citizen, and should then be circulated between the public administrations who need it for their public tasks.

As a final note, it should be mentioned that tackling these challenges is complicated by the fact that administrations face major budgetary shortcomings that hamper the development of e-services. Indeed, doing "more with less" constitutes, in itself, an additional challenge.

B. Public sector attractiveness

The development of innovative and efficient e-services by public administrations also requires to rely on highly skilled civil servants to design and build such innovative e-services. Yet, in Belgium, the public sector struggles to compete with the private sector when it comes to attracting specific strongly demanded profiles, such as IT specialists. To solve this problem, a series of enablers for attracting and retaining IT profiles are presented below. These enablers have been identified thanks to a focus group organised with civil servants, specialised in HR, of the Federal and Walloon 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.

Enablers for attracting IT profiles

In order to facilitate the attraction of IT profiles, more internal flexibility is needed. This flexibility should materialise in different forms. Firstly, more flexibility is needed in terms of diploma requirements. Indeed, the administrations indicated during the focus group that it should be 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. Secondly, there is a need for flexibility in terms of salaries. Currently, there is none, as everything is scaled (the salary for function X is Y) and it is hard to derive from this. 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. Thirdly, flexibility is needed in terms of contract length. This has to do with an efficient use of resources. A suggested enabler here is to make it easier to hire people for short contracts. Finally, more flexibility on the procedure is needed. A flexible framework should be

[7] Loi du 5 mai 2014 garantissant le principe de la collecte unique des données dans le fonctionnement des services et instances qui relèvent de ou exécutent certaines missions pour l'autorité et portant simplification et harmonisation des formulaires électroniques et papier, *M.B.*, 4 juin 2014.

set, in order to be able to adapt to the market, without waiting every time for the Minister's approval.

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. Indeed, the administrations do not communicate enough on the recent evolutions and projects, nor about the interesting jobs that are offered. As a lead for solution, administrations should engage in "active employer branding", in order to wash-off the negative stereotypes, generate an appealing image and rebuild trust in the public sector. This need to communicate is especially true towards young people who just finished their studies, as they are a privileged target for the public sector. A lead for solution is to offer more traineeships to students, so that they can discover the public sector during their studies.

Finally, 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.

Enablers to keep specific profiles in the administration

Because of the digitalisation of the public sector, some civil servants no longer feel like they are working for the common good. This creates a "loss of purpose" for some civil servants, who do not feel like they are helping people. Yet, this is not inevitable, as several studies have outlined the factors motivating people to join the public sector. Accordingly, the administrations should not only focus on their traditionally perceived strengths, such as offering secure jobs with a good work-life balance, but should also focus on other motivating factors, such as attractive development opportunities.

A huge advantage in the public sector is the "continuous training policies". Therefore, the administrations should really push for these kinds of initiatives. A lead for solution would be to push projects consisting in training people, whose current job will disappear because of the digitalisation, in order to reorient them professionally.

Finally, creating a trust relationship between the management and the civil servants is key. In this regard, a lead for solution is to grant more flexibility to the civil servants. For instance, many Federal Public Services have created some form of flexibility in their civil servants' schedule. In essence, there are moments on the day where they are flexible, and others where they are not.

4.3.7. Location-based data

In the Work Package 3 Report, a number of requirements have been identified for the enabler Location-based Data, which can be grouped into four clusters, i.e. coordination; up-to-dateness and production of data; the production of the Belgian topographic map; and interoperability. Accordingly, we a number of potential enablers dealing with these requirements were suggested.

A. Invest in authoritative data

The first aspect of the ongoing evolution is the broadening of location data providers. Departing from centralistic monopolies on location-based data (such as national mapping agencies), more and more actors are being established over the past decades, and continue to be established. The increasing amount of location data providers leads to the need for public administration organisations to continue and increase their investments into authoritative data. Indeed, as demonstrated by the study of Crompvoets et al. (2019), the future role of national mapping

agencies lies especially in the provision, both to the public and private sector, of data which can be considered as authoritative data. Providing data which is labelled as authoritative, and as such meets certain quality criteria, will ensure the relevancy of the organisations and will be beneficial for both the public and private sector (Crompvoets et al., 2019). It will increase, especially in the public sector, the efficiency of service delivery, since the same data can be reused several times, leading to a more efficient use of resources by the public sector.

B. Use the increasing heterogeneity to collect data

Recognising this increased (and still increasing) heterogeneity in the landscape of location-based data is of crucial importance for public administrations, and as such also for the Belgian federal administration. The landscape of location-based data includes a wide variety of actors, and whereas this could be considered as a threat for the public administrations collecting location-based data, it could be also become an opportunity. Indeed, there is a potential in collaborating with non-public sector actors, such as private companies or crowdsourcing organisations, to collect data. This data could then be re-used by the public sector for the delivery of public services. A well-known example of this collaboration is the delivery of anonymised location-based data by Proximus to Eurostat and the FPS Economy – Statistics Belgium (Debusschere et al., 2016). The data is used for understanding, among others, population movements, which is crucial information for policy makers. Making use of the increased heterogeneity of location-based data, via different kinds of collaborations between public and non-public sector organisations, is therefore advisable, as it notably the collection of location-based data.

C. Invest in cross-cutting issues

There are many data silos, both within public administrations and government levels and between them. A first enabler to deal with this difficulty is organisational. In order to get an overview of the existence of the different silos, and especially of the needs that led to the creation of those silos, one needs an entity that can capture and consolidate these needs and translate them into concrete data needs, match this with the offer of data on the market (governmental and private), and receive the mandate and the budget to facilitate overarching solutions or hubs. A second enabler is related to the way of presenting the challenge. Focusing on specific cross-cutting issues and topics (such as transport, emergency services, health care, energy, water, and construction) is required, rather than focusing purely on the integration of datasets *for the common good*. Approaching it from specific cross-cutting issues and topics will set a sense of urgency among the different actors involved. It will, as such, lead to the setting of concrete steps towards governmental and domain overarching solutions, intentionally leading to rationalisation and consolidation of data creation, use and potentially reuse. Creating this sense of urgency is one of the crucial driving factors for cooperation.

D. Develop appropriate governance structures

From a governance perspective, it is important for location-based data that the appropriate governance structures are developed. The importance of governance structures, also in the field of location-based data, has been discussed in detail in the "Organisational Structures" enabler. In this regard, three examples of overarching governance approaches are suggested. It is important to underline that those approaches can be combined. Indeed, the use of one governance approach does not exclude the other approaches.

Central organisation playing the role of front driver for location and Digital Government Transformation

One governance possibility for the reform of governance structures is focused on the integration of location strategies in the mission of the central organisation responsible for digital transformation. If this logic were to be adopted at the Belgian federal level, it would be advisable to first of all designate a central organisation for the interlinking and rationalisation of geodata, and to indicate the authoritative datasets for this purpose. It goes without saying that this would be in closer cooperation with the DG DT of FPS BOSA, as a result of which 'location' could become a fundamental part of the federal data infrastructure.

Strong stakeholder networks

Another governance option is a very strong stakeholders' representation, and openness towards inputs from academia and the private sector. This kind of governance approach can be connected to the above-described approach, and allows creating a widely supported approach towards location-based data. If this logic were to be adopted at the Belgian federal level, the creation of strong stakeholder networks (of producers, end users, and distributors) would make it possible to offer more user-centric data, to adjust processes and also to uncover and address ambiguities in the creation, management and distribution of that data.

Inter-ministerial Committee as legal instrument

A third relevant governance approach is the inter-federal cooperation. If this logic were to be adopted at the Belgian federal level, an intergovernmental platform at ministerial level could be a solution (1) to support the need for cooperation and (2) to answer the call of producers and users of geodata for consistent datasets across different levels of government, rather than having many different and separated datasets about the same phenomenon.

Invest in cross-domain protocols and standards

By joining international standardisation communities, such as the OpenGeospatialConsortium, one can firstly contribute to the development of cross-domain standards and protocols (such as SensorThings API and OpenAPI), making specific issues such as *location* addressable in a generic way (W3C-compliant), and ensure that one's own needs are also taken into account in that development. Secondly, as an organisation, one can learn from and contribute to such global communities of practice for the implementation of such standards. Thirdly, by joining international standardisation communities, one can work towards common standard(s) in a neutral environment, thereby potentially eliminating local, regional and national deadlocks, and also making way for the use of more generic software solutions, rather than local and specific software solutions. An international governance framework for the development of standards offers a potential environment for the elimination of local, regional and national disagreements.

E. Increase transparency of location

As an organisation that develops or manages an e-service, it can be quite challenging to have an overview of the data landscape and to know which dataset is most suitable. Although within one administration there can be several entry points to find the suitable data, it is quite challenging for non-specialised organisations (in this case non-location-based data oriented organisations) to find the required data (in this case location-based data). There are also datasets at different levels of government, for example for roads, watercourses, buildings, land use, etc. For end users

dealing with these different levels of government, this diversity can be very confusing and lead to incompatible e-services because public administration organisations can, because of the difficulties in finding suitable data, use different datasets pertaining to the same, or almost the same, things.

The development of data portals are, as such, an enabler, and ensure that organisations can find the data they require. The data portals ensure that data is findable and accessible. Those portals have to provide an overview of the different datasets that exist for the different location themes (cf. INSPIRE / ISO19115). Also, it would be relevant to indicate on the data portals how the datasets can be used (what is the application area) and what the usefulness of the different types of data is. It would also be relevant to indicate the relevancy of datasets for potential e-services, and potentially relevant software, tools and standards for the different datasets. Although the inclusion of this type of information for the different datasets might be resource intensive for the data providers, it could be a way to ensure that non-expert users from a non-location-based data organisation have an improved view on the possibilities offered by the datasets on the data portal.

Besides the potential of further developing data portals, a knowledge repository could also be a positive evolution in the further development and use of a geo-data infrastructures or ecosystems.

4.3.8. Integration: Cross-cutting policy options

On the basis of the outcomes of, among other, WP4, the research team has been able to identify a number of Strategy Priorities, which are described in WP6 - Strategy for Flexible Geospatial Public e-Services (see Section 4.5 below). In WP4, those Strategic Priorities have been cross-checked with two highly relevant other strategies, i.e. Digital Belgium (2015-2020) and Sustainable Development Goals (2015-2030), and in particular Goal 9 and Goal 16. The content of Digital Belgium and the Sustainable Development Goals were first described. Then, the identified Strategic Priorities were described and cross-checked in relation to the content of Digital Belgium and Goal 9 and 16 of the Sustainable Development Goals. On the basis of this cross-check, it could be concluded whether the identified Strategic Priorities are cross-cutting policy options or not. These results can be found in Chapter 10 of the Work Package 4 Report.

4.3.9. Risks and impact assessment

Finally, the team analysed the risks that could prevent the implementation of the enablers mentioned above, and of the likelihood of occurrence of those risks. The focus here thus lied on risks that could lead to the *non-implementation* of the suggested enablers. The likelihood of occurrence of these risks was then presented as being: (i) very low; (ii) low; (iii) moderate; (iv) high; or (v) very high. Risk mitigation factors were then proposed, which suggest actions to circumvent the risk, or circumstances that reduce the risk's impact. Finally, the consequences of the lack of implementation of the enablers were outlined in an impact assessment. All of these elements can be found in Chapter 11 of the Work Package 4 Report.

4.3.10. Report

A detailed overview of the Enablers can be found in the Work Package 4 'Enablers' Report published in 2020:

> Chantillon, M., Kruk, R., Simonofski, A., Tombal, T., Crompvoets, J., de Terwangne, C., Habra, N., Snoeck, M., & Vanderose, B. (2020). *FLEXPUB Public e-Service*

Strategy - Work Package 4 – Enablers. Leuven: KU Leuven Public Governance Institute.

This Report can be consulted via the following link.

4.4. Work Package 5: Case Studies

The goal of "Work Package 5 - Case studies" was double. On the one hand, it aimed to present the challenges that were faced in three case studies which all have a strong link to location-based data and to echo these challenges with the key requirements for future e-service delivery by the federal administration identified in WP3, and the enablers identified in WP4. On the other hand, it aimed to test the strategic actions suggested in the Draft Strategic Vision for Location-based e-Services (WP6 – see Section 4.5 below) and the guidelines suggested in the Draft Blueprint for an Adaptive and Innovative Government (WP7 – see Section 4.6 below) by confronting them to real-life scenarios. This iterative process allowed the research team to refine these strategic actions and guidelines. To do so, a selection of three case studies closely linked to location-based data was made, on the basis of input the team received from the Members of the Follow-up Committee and of the relevancy of the proposed cases for the project, in light of the results of previous WPs. Three cases were selected for the FLEXPUB research project based on (1) the proposals put forward by the Members of the Follow-up Committee, and (2) the relevancy of the proposed cases compared to the results of WP 2. The three case studies were BeSt Address, Emergency Services in Belgium, and Cadastral Information Exchange in Belgium.

The same methodological approach was applied for all three cases, with one exception – the BeSt Address case study also included field observations. The team created a questionnaire for each case study, based on the draft Strategy and Blueprint of WP 6 and WP 7 and a first understanding of the case which was studied. This questionnaire was then used for the interviews. Besides the interviews, the team also conducted desk research, and more specifically a document analysis for each of the three cases. The document selection was a combination of purposive sampling and snowball sampling (Bryman, 2016). Some documents were known by the researchers, others were signalled to the researchers by the interviewees and a final group of documents was retrieved on the basis of guidance via the two above-mentioned groups of documents. Finally, the team was allowed as observer to the BeSt Address Committee Meetings, so for this case also a field observation took place. This was not the case for the two other case studies. It is the only methodological difference between the three case studies. An overview of the approaches can be found in the table below. Overall, it can be said that a multi-method approach was followed for the case study research.

Case Study Approach		
Case 1 – BeSt Address	**Case 2 – Exchange of Cadastral Information**	**Case 3 – Emergency Services**
Semi-structured Interviews	Semi-structured Interviews	Semi-structured Interviews
Document Analysis	Document Analysis	Document Analysis
Field Observation		

4.4.1. Case 1: BeSt Address

A. Case Context

The BeSt Address project strives for the unification of the way of referencing addresses and the way of linking address data. To do so, the project aims to unify the references used for addresses, in particular by making recommendations on data models; to maintain the reference of addresses according to a Belgian standard; and to unify the rules for the allocation of addresses. This will make it possible to geolocate in a secure and unambiguous way, within administrations, each street and each address[8]. To do so, each Region will manage a register of addresses (as an authentic source) for its own territory.

This case, which focusses on a key type of location-based data, namely addresses, was signalled by a significant number of members of the Follow-up Committee as it includes various stakeholders (at the Federal, Regional and Local level), as it forms the basis for a well-functioning geospatial infrastructure, and as it has a strong historical-legacy (the premises of the project started at beginning of the 21st century), all of which is highly relevant to test the previous findings of the FLEXPUB project.

B. Case Recommendations

On the grounds of the analysis of the challenges (which can be found in the detailed WP5 Report), recommendations for the future of the case were made. These are structured in the WP5 Report on the basis of the three pillars underlying the Strategy (WP6) and the Blueprint (WP7), i.e Openness, Participation and Collaboration. For the purpose of this Final Report, the recommendations are structured in two categories. On the one hand, the recommendations that are specific to the BeSt Address project. On the other hand, the recommendations that have a larger scope and that are, as such, relevant for other actors, organisations, projects etc.

Recommendations specific to the BeSt Address project

> ***Recommendation 2:*** *Ensure that the new anomaly notification service system, developed by BOSA for the information exchange platform, does not run parallel to the existing Regional anomaly notification services, but rather is considered as an extra-layer that is connected to the existing Regional anomaly processes; and ensure that the anomalies reported to BOSA are automatically forwarded to the relevant Region who can then, in turn, forward it to the local community.*
>
> ***Recommendation 3:*** *Elaborate a clear communication strategy about the creation of the Draaiboek (relayed by the VVSG, the UVCW and Brulocalis) in order for each local community in Belgium to be made aware of its existence. Additionally, its effective dissemination in the hands of every local community should be ensured. Training sessions on how to use the BeSt address model, on the basis of this Draaiboek, should also be organised. A work plan containing the steps that need to be taken and the targets to be reached could also be provided.*
>
> ***Recommendation 4:*** *Elaborate a clear communication strategy (relayed by the VVSG, the UVCW and Brulocalis) towards the local communities, about the progress of the BeSt address*

[8] Accord de coopération du 22 janvier 2016 entre l'Etat fédéral, la Région flamande, la Région wallonne et la Région de Bruxelles-Capitale concernant l'unification de la manière de référencer les adresses et de la mise en relation des données d'adresses, *M.B.*, 15 février 2016. Available at http://www.ejustice.just.fgov.be.

project. This should be done by the Address committee in a first phase, and by the National Register in a second phase. This communication should not only target the civil servants in the local communities, but also the political deciders in these local communities so they can understand the ambit of the project and the need to allocate the necessary funds and workforce. Moreover, it should also be communicated about the fact that while the local communities have the competence to prosecute cases of urban planning violations, they do not have the obligation to do so. The only legal risk that a local community might face if it doesn't prosecute a violation, that it has been made aware about via the use of the BeSt address model, is if this violation then causes a damage to a third party and that this third party brings an action for damages against this local community, which is very unlikely.

Recommendation 4bis: *Provide the possibility for the local communities to file requests to obtain the budget and man power necessary to ensure the validation of the addresses contained in the Regional registers (for instance via the "Inter-federal project fund" whose creation is recommended in Recommendation 7).*

Recommendation 4ter: *Create a legal obligation, in Wallonia and in Brussels, for the local communities to use the Regional registers, similarly to what is done in Flanders with the CRAB-decree*[9]*.*

Recommendation 5: *The Federal Partners should start using the Regional registers and the BeSt address model as of the 30th of June 2020, as planned in the Cooperation agreement. Given that this first phase of the project will only entice the use of these Regional registers for new encodings and modifications, and not for the alignment of the existing addresses in the Federal registers (second phase), the quality of these Registers should be taken "as is", as the impact of this first phase will be limited on the Federal registers. Moreover, the best way to increase these Regional registers' quality in order to prepare for the second phase is precisely if all the Federal Partners start working with them, because if everyone uses the same source, the quality will necessary improve, thanks to the anomaly notification service.*

Recommendation 5bis: *The Brussels government should request the local communities of Brussels to validate the box numbers imported from the federal registers into URBIS. Moreover, it should be requested from Civadis, which is the service provider of the local communities in Brussels, to ensure that the local communities will no longer be able, as of the 30th of June 2020, to register addresses that are not contained in URBIS. In case such a problem occurs, Civadis should ensure a link towards the URBIS anomaly notification service.*

Recommendation 5ter: *The three Regions and BOSA should dedicate sufficient time and resources in order to come up with a successful "Solution Design" in order to ensure harmonisation between the three Regional Registers regarding the address ID lifecycle.*

Recommendations that have a larger scope than the BeSt address project

Recommendation 1: *Develop a common licence, for all the Open data services of the Federal and Regional entities falling within the INSPIRE implementation framework, which would replace the current licence fragmentation. These licencing considerations should be discussed by the INSPIRE committee, in order not to be limited to addresses. The standard for such*

[9] Decreet van 8 mei 2009 betreffende het Centraal Referentieadressenbestand, *M.B.*, 1 juli 2009 ; Decreet van 1 juni 2012 houdende wijziging van het CRAB-decreet van 8 mei 2009, *M.B.*, 12 juni 2012.

licence should be based on European standards, namely the CC-BY[10] *or the CC-0*[11] *Creative Commons licence.*

Recommendation 6: *Ensure that the collaborative approach adopted for the BeSt address project is repeated in the future. For these future projects, it should be reflected on the possibility to designate a specific project facilitator for organisational tasks who would be paid to make the project run more efficiently. This project facilitator could either come from one of the entities participating in the project or could be a private sector consultant (which might be easier to accept for all the parties in light of the fact that there is no hierarchy between the Federal and Regional levels). To be sure, the decisional power should remain in the hands of the participants of the project, as the project facilitator should not decide anything but rather provide them with the necessary support and preparatory work.*

Recommendation 7: *Reflect on the possibility to create an "Inter-federal project fund", financed by the Federal level and the three Regions, which would offer the possibility to the parties participating in an inter-federal collaboration project involving the Federal level and the three Regions, such as BeSt address, or to the parties that have to implement this project, to file a request to obtain some budget from this fund.*

Recommendation 8: *Strive for the creation of an interoperability framework within which each entity (Federal and Regions) can exchange their information in an appropriate manner, within a system where all authentic data sources are linked to each other. From a more specific perspective, it should be reflected on the possibility to launch, in the near future, a cooperation project for the integration of building registers. Later on, it should also be reflected on the possibility of creating an integrated register of cadastral parcels, that would be linked with the integrated building registers.*

C. Connection to WP6 Strategy and WP7 Blueprint

In this section the impact of the recommendations on the strategic actions suggested in the Draft Strategic Vision for Location-based e-Services (WP6) and on the guidelines suggested in the Draft Blueprint on Adaptive and Innovative Government (WP7) is outlined. The focus lies thereby on the recommendations that have a larger scope than the case study itself.

Recommendations that have a larger scope than the BeSt address project	Impact on WP6 Strategy and WP7 Blueprint
Recommendation 1: *Develop a common licence, for all the Open data services of the Federal and Regional entities falling within the INSPIRE implementation framework, which would replace the current licence fragmentation. These licencing considerations should be discussed by the INSPIRE committee, in order not to be limited to addresses. The standard for such licence should be based on European standards,*	This recommendation echoes the strategic action suggested in the Draft Strategic Vision for Location-based e-Services (WP6), according to which the Federal, Regional's and Communities' governments should harmonise their "data re-use licences" in order to avoid licensing incompatibilities' issues. This strategic action will thus be further refined on the basis of this recommendation.

[10] https://creativecommons.org/licenses/by/2.0/be/
[11] https://creativecommons.org/publicdomain/zero/1.0/deed.fr

namely the CC-BY[12] *or the CC-0*[13] *Creative Commons licence.*	
Recommendation 6: *Ensure that the collaborative approach adopted for the BeSt address project is repeated in the future. For these future projects, it should be reflected on the possibility to designate a specific project facilitator for organisational tasks who would be paid to make the project run more efficiently. This project facilitator could either come from one of the entities participating in the project or could be a private sector consultant (which might be easier to accept for all the parties in light of the fact that there is no hierarchy between the Federal and Regional levels). To be sure, the decisional power should remain in the hands of the participants of the project, as the project facilitator should not decide anything but rather provide them with the necessary support and preparatory work.*	As this recommendation has stemmed thanks to the analysis made in the context of the BeSt address project and proves valuable for any project led by the public administrations, it will be added to the strategic actions suggested in the Draft Strategic Vision for Location-based e-Services (WP6) and to the guidelines suggested in the Draft Blueprint on Adaptive and Innovative Government (WP7).
Recommendation 7: *Reflect on the possibility to create an "Inter-federal project fund", financed by the Federal level and the three Regions, which would offer the possibility to the parties participating in an inter-federal collaboration project involving the Federal level and the three Regions, such as BeSt address, or to the parties that have to implement this project, to file a request to obtain some budget from this fund.*	This recommendation echoes the strategic action suggested in the Draft Strategic Vision for Location-based e-Services (WP6), according to which an Innovation and Collaboration Funding Mechanism should be created to support federal organisations dealing with innovative and collaborative projects. This strategic action will thus be further refined on the basis of this recommendation, as it targets collaboration between levels of power, and not just collaboration within the Federal level.
Recommendation 8: *Strive for the creation of an interoperability framework within which each entity (Federal and Regions) can exchange their information in an appropriate manner, within a system where all authentic data sources are linked to each other. From a more specific perspective, it should be reflected on the possibility to launch, in the near future, a cooperation project for the integration of building registers. Later on, it should also be reflected on the possibility of creating an integrated register of cadastral*	This recommendation echoes, to a certain extent, two of the strategic actions of the Draft Strategic Vision for Location-based e-Services (WP6), namely: i. The suggested creation of a Working Group on Standardisation, with representatives of all federal organisations, to discuss, and when possible and feasible, propose and approve common standards, thereby respecting the organisational independence and expertise;

[12] https://creativecommons.org/licenses/by/2.0/be/
[13] https://creativecommons.org/publicdomain/zero/1.0/deed.fr

parcels, that would be linked with the integrated building registers.	ii. That this Working Group on Standardisation should work with the FPS BOSA – DG DT on the establishment and implementation of common standards derived, if possible, from other already existing standards, be it at the supranational (preferably) or regional level. This recommendation however goes further than the Draft Strategic Vision, as it not only calls for cooperation at the Federal level, but rather between the Federal and the Regional levels. Accordingly, the suggested strategic actions will be adapted in order to call for such a wider cooperation.

4.4.2. Case 2: Cadastral Information Exchange in Belgium

A. Case Context

The management of cadastral information in organised by the Federal Public Service Finance, and more precisely the General Administration for Patrimonial Information. This information is used for several policy goals, with the help of partners at the federal, regional and local level. There are two main policy goals of cadastral information. On the one hand, there is a taxation purpose. On the basis of a number of factors, the cadastral revenue is decided upon, which serves as a taxation basis for the various Belgian administrations. On the other hand, the cadastral information is used in the urban planning. This case study focused on the exchange of cadastral information in the federal Belgian context, and attempted to create an overview of the different challenges and requirements faced by the administrations working with this data.

This case, which focusses on a key type of location-based data, was signalled by a number of stakeholders at different administrative levels. This is because the cadastral system is increasingly used by different stakeholders for urban planning, while it was originally created as a tool to tax landowners. Moreover, the complex organisational relations between the federal, regional and local administrations, especially regarding synchronisation of information, is a useful case study for the FLEXPUB project.

B. Case Recommendations

On the grounds of the analysis of the challenges (which can be found in the detailed WP5 Report), recommendations for the future of the case were made. These are structured in the WP5 Report on the basis of the pillars underlying the Strategy (WP6) and the Blueprint (WP7), i.e Openness, Participation and Collaboration. For the purpose of this Final Report, the recommendations are structured in two categories. On the one hand, the recommendations that are specific to the Cadastral Information Exchange case. On the other hand, the recommendations that have a larger scope and that are, as such, relevant for other actors, organisations, projects etc.

Recommendations specific to the Cadastral Information Exchange Case

Recommendation 2a: *Continuously improve data quality and data update schedules towards the different actors, taking into account the service delivery towards end users, internal resources and connections to other datasets.*

Recommendation 4a: *Evaluate the overall communication approach towards the local level, thereby focusing on the need for an established two-way communication which allows local administrations to transfer their requirements to the higher public administrations. Redesign the communication approach towards the local level on the basis of this evaluation.*

Recommendation 4b: *Set-up an online communication platform that allows local administration staff working with cadastral information to communicate with other local administration staff, that is managed, both from a technical and content wise perspective, by the Federal Public Service Finance. Such a platform will allow for a structured network communication among local administrations, and create the possibility for the Federal Public Service Finance to see what specific requirements exists among local administrations.*

Recommendation 5: *Rethink the possibilities to define the cadastral revenue from a data perspective, by increasingly taking into account the potentially relevant data collected at regional, provincial and local level.*

Recommendation 8: *Agree on a roadmap with common policy objectives and priorities to increase the overall service delivery in the area of cadastral information sharing towards the end users.*

Recommendation 9a: *Clearly define the responsibilities, and also the relations, between the different coordination bodies active the geospatial and/or digital domain.*

Recommendations specific to the Cadastral Information Exchange Case

Recommendation 1: *Establish a coordinated approach on the concept of "authoritative source" and agree on quality requirements.*

Recommendation 2b: *Provide data in a format that allows the receiving organisation to develop a personalised tool/platform.*

Recommendation 2c: *Agree on interoperability standards that are applicable to the different Belgian public administrations, thereby focusing on legal, organisational, semantic and technical interoperability.*

Recommendation 3: *Agree on a common open data licence across the different Belgian public administrations.*

Recommendation 4c: *Continuously invest in skills and competencies trainings for local administration staff that is working with the data and tools offered by a higher public administration, focused on continuous learning and the use of new technologies.*

Recommendation 6: *Reinforce the creation of e-service building blocks (e.g. generic API's and open services) for local administrations and other interested parties, in collaboration with the target groups.*

Recommendation 7a: *Include service users in a consistent way in the service development process, thereby relying on good practices from other public administrations and the literature – especially on how to include the citizens' perspective in the service development process.*

Recommendation 7b: *Ensure a close connection between the internal service users, i.e. the organisation's staff working with the (future) service, and those actors developing, from a technical perspective, the service. A close connection in the service development process will lead to an efficient and effective use of the developed service.*

Recommendation 9b: *Establish, in policy domains that require the exchange of data and information between federal organisations and the three regional organisations, coordination bodies with the necessary resources that can stimulate the exchange of data and information.*

C. Connection to WP6 Strategy and WP7 Blueprint

In this section the impact of the recommendations made for the Cadastral Information Exchange case, on the strategic actions suggested in the Draft Strategic Vision for Location-based e-Services (WP6) and on the guidelines suggested in the Draft Blueprint on Adaptive and Innovative Government (WP7) is outlined. The focus lies thereby on the recommendations that have a larger scope than the case study itself.

Recommendations that have a larger scope than the case	Impact on WP6 Strategy and WP7 Blueprint
Recommendation 1: *Establish a coordinated approach on the concept of "authoritative source" and agree on quality requirements.*	This recommendation echoes the strategic action suggested in the Draft Strategic Vision for Location-based e-Services (WP6), that suggests that "a Belgian approach towards authoritative data sources is further developed, including the three regional administrations and the federal administration". The strategic action will be further refined on the basis of this recommendation. This recommendation was not present in the Draft Blueprint for Adaptive and Innovative Government (WP7) as has been included as one of the Strategic Actions suggested in the draft.
Recommendation 2b: *Provide data in a format that allows the receiving organisation to develop a personalised tool/platform.*	This recommendation echoes the strategic action suggested in the Draft Strategic Vision for Location-based e-Services (WP6), that suggests that "the federal organisations work on making their data available via Application Programming Interfaces (APIs)". Also, on the basis of this case study and BeSt Address case study, an extra strategic action is suggested: "the federal organisations explore open data solutions (standards, licenses, platforms, etc.)

	to foster the collaboration between an ecosystem governmental organisations". This recommendation echoes the Strategic Action suggested in the Draft Blueprint for Adaptive and Innovative Government (WP7) that refers to the need to "making its data availbale via Application Programming Interfaces (APIs).".
Recommendation 2c: *Agree on interoperability standards that are applicable to the different Belgian public administrations, thereby focusing on legal, organisational, semantic and technical interoperability.*	This recommendation was not present in the Draft Strategic Vision for Location-based e-Services (WP6) and has therefore been included in the following way: "strives for the creation of an interoperability framework within which each entity (Federal and Regions) can exchange their information in an appropriate manner, within a system where all authentic authoritative data sources are linked to each other". This recommendation was partially present in the Draft Blueprint for Adaptive and Innovative Government (WP7), and has been further strengthened.
Recommendation 3: *Agree on a common open data licence across the different Belgian public administrations.*	This recommendation was partially present in the Draft Strategic Vision for Location-based e-Services (WP6) and has therefore been included in the following way: "the federal, regional's and communities' governments develop a common licence for all the Open data services of the Federal, Regional and Community entities falling within the INSPIRE implementation framework, which would replace the current licence fragmentation in order to avoid licensing incompatibilities' issues. The standard for such licence should be based on European standards, namely the CC-BY or the CC-0 Creative Commons licence". This recommendation echoes the Strategic Action in the Draft Blueprint for Adaptive and Innovative Government (WP7) that refers to the need to "strive towards harmonising the various "data re-use licences".
Recommendation 4c: *Continuously invest in skills and competencies trainings for local administration staff that is working with the data and tools offered by a higher public administration, focused on continuous learning and the use of new technologies.*	This recommendation was partially echoed in the strategic action suggested in the Draft Strategic Vision for Location-based e-Services (WP6), that suggests that "training activities are not only offered to staff of the own administration, but also to staff of local

	administrations working with specific services offered by the federal administration". As this strategic action only partially reflects this recommendation, it was decided to include also the following recommendation in the Draft Strategic Vision for Loaction-based e-Services (WP6): "that training activities are not only offered to staff of the own administration, but also to staff of local administrations working with specific services offered by the federal administration". This recommendation was not present in the Draft Blueprint for Adaptive and Innovative Government (WP7) as has been included as one of the Strategic Actions suggested in the draft.
***Recommendation 6**: Reinforce the creation of e-service building blocks (e.g. generic API's and open services) for local administrations and other interested parties, in collaboration with the target groups.*	This recommendation echoes the strategic action suggested in the Draft Strategic Vision for Location-based e-Services (WP6), that suggests that "the federal organisations work on making their data available via Application Programming Interfaces (APIs)". Also, on the basis of this case study and BeSt Address case study, an extra strategic action is suggested: "the federal organisations explore open data solutions (standards, licenses, platforms, etc.) to foster the collaboration between an ecosystem of governmental organisations". This recommendation echoes the Strategic Action suggested in the Draft Blueprint for Adaptive and Innovative Government (WP7) that refers to the need to "making its data availbale via Application Programming Interfaces (APIs).".
***Recommendation 7a**: Include service users in a consistent way in the service development process, thereby relying on good practices from other public administrations and the literature – especially on how to include the citizens' perspective in the service development process.*	This recommendation echoes the various suggested strategic actions under the title "Participation" in the Draft Strategic Vision for Location-based e-Services (WP6). Also, on the basis of this case study and Emergency Services case study, an extra strategic action is suggested: "the public administrations implement participation through complementary methods (offline and online) and make the processing of the requirements transparent so that their impact on the public e-service is clear to users". This recommendation echoes the Strategic Actions suggested in the Draft Blueprint for Adaptive and Innovative Government (WP7)

	that refer to the integration of the "input from citizens and external users" as well as the need to develop "the appropriate methods and tools".
***Recommendation 7b**: Ensure a close connection between the internal service users, i.e. the organisation's staff working with the (future) service, and those actors developing, from a technical perspective, the service. A close connection in the service development process will lead to an efficient and effective use of the developed service.*	This recommendation echoes the strategic action suggested in the Draft Strategic Vision for Location-based e-Services (WP6), that suggests • "that, given that our attention was drawn to the need for stronger involvement, ownership, responsibility and accountability of civil servants in e-services and the development process, the civil servants are to be actively supported by their top- and middle-management to participate in the development of those e-services"; • "that, the DG DT and the DG Recruitment and Development of the FPS BOSA develop a platform serving as a repository of good practices, of which the different federal organisations could make use when (re)developing an e-service, to guide civil servants in the e-service transition process. This toolbox can be made available via the federal intranet or FEDWEB website". Also, on the basis of this case study and Emergency Services case study, an extra strategic action is suggested: "appropriate training is suggested to public servants to enable them to participate in the development. This training could draw from innovative principles such as SCRUM methods, drawings, improvisation principles, etc.". This recommendation echoes the Strategic Actions suggested in the Draft Blueprint for Adaptive and Innovative Government (WP7) that refer to the integration of the "input from citizens and external users" as well as the need to develop "the appropriate methods and tools".
***Recommendation 9b**: Establish, in policy domains that require the exchange of data and information between federal organisations and the three regional organisations,*	This recommendation was not echoed in the Draft Strategic Vision for Location-based e-Services (WP6), therefore the following Strategic Action is suggested: "when the

coordination bodies with the necessary resources that can stimulate the exchange of data and information.	federal administration as well as three regional administrations need to actively coordinate their policy, an inter-federal coordination body is established, which can rely on the necessary resources, to stimulate collaboration across public administrations." This recommendation echoes the Strategic Actions suggested in the Draft Blueprint for Adaptive and Innovative Government (WP7) that refer to "the intensified back-office collaboration and cooperation with the other governmental levels".

4.4.3. Case 3: Emergency Services in Belgium

A. Case Context

A case study pertaining to the cartographic system of emergency services, with a specific focus on dispatching (ASTRID), was originally suggested by a member of the Follow-up Committee. After internal discussion, the research team decided to broaden this case study. Instead of focusing only on ASTRID, attention will go to the broader context of emergency services in Belgium. ASTRID nevertheless remains the starting point for this case study.

This case is relevant for FLEXPUB as it encounters several recurrent problems such as maintaining and automatically updating data, or the difficulty to include external data. Moreover, a number of technical challenges linked to the mapping of emergencies have been signalled. Yet, a well-functioning emergency system is part of the basic tasks of the State.

B. Case Recommendations

On the grounds of the analysis of the challenges (which can be found in the detailed WP5 Report), recommendations for the future of the case were made. These are structured in the WP5 Report on the basis of the pillars underlying the Strategy (WP6) and the Blueprint (WP7), i.e Openness, Participation and Collaboration. For the purpose of this Final Report, the recommendations are structured in two categories. On the one hand, the recommendations that are specific to the Emergency Services case. On the other hand, the recommendations that have a larger scope and that are, as such, relevant for other actors, organisations, projects etc.

Recommendations specific to the Emergency Services context

> ***Recommendation 2:*** *Develop a new updating system for the data in collaboration with the NGI (Collaboration). This new updating system could take the form of a flagging that would enable the updating process to be more transparent for everyone (NGI, Operators, ASTRID).*
>
> ***Recommendation 3:*** *Extend the Community of Practice (or create a new community) with external stakeholders, fueled with the insights collected from users (Collaboration). Thanks to a new meeting platform or the improvement of an existing one, the collaboration with actors outside the "core" of emergency services will be easier. Furthermore, a study on the motivation of stakeholders to come to those meetings should be performed to increase attendance.*

Recommendations that have a larger scope than the Emergency Services context

Recommendation 1*: "Explore Open Data solutions for the emergency services ecosystem, in order to standardise and collect data from several sources" (Openness). The point of this recommendation is to test open data best practices (standards, licenses, portals, etc.) within a small ecosystem of emergency service stakeholders to see if the exchange of data could be improved in consequence.*

Recommendation 4*: Implement the participation of users through complementary methods and make the processing of requirements transparent (Participation). A number of methods could be used such as workshops, interviews, online platforms, etc. The focus should be set on the complementarity of these methods and on the transparency of the requirements process.*

Recommendation 5*: Tailor several AGILE practices to the constraints of the public sector (Participation). For instance, the budget challenge may be handled by keeping a waterfall process at the beginning of the project, or around the release time, while implementing an AGILE process throughout the system development phases. Various change management models could be considered to change the culture of ASTRID for AGILE or to justify budgeting, e.g., the Satir process model and the Kotter's eight steps model.*

Recommendation 6*: Continue to innovate in the training of the operators and to test interface adaptation depending on the different maturity level (Participation). The adaptation of the interface should be iteratively performed so the best interface depending on the maturity of the users is chosen. The 10 principles of Nielsen of interface testing could be used as a structuring analysis theme to perform this study.*

C. Connection to WP6 Strategy and WP7 Blueprint

In this section the impact of the recommendations made for the Emergency Services case, on the strategic actions suggested in the Draft Strategic Vision for Location-based e-Services (WP6) and on the guidelines suggested in the Draft Blueprint on Adaptive and Innovative Government (WP7) is outlined. The focus lies thereby on the recommendations that have a larger scope than the case study itself.

Recommendations that have a larger scope than the case	Impact on WP6 Strategy and WP7 Blueprint
Recommendation 1: *Explore Open Data solutions for the emergency services ecosystem, in order to standardise and collect data from several sources.*	Echoes the recommendation "Rethinking the information management system" (Openness Pillar) and "Builds on common service and data approaches to stimulate cooperation across governments" (Collaboration Pillar).
Recommendation 4: *Implement the participation of users through complementary methods and make the processing of requirements transparent.*	Echoes the recommendation "Integrates the input from citizens and external users" (Participation Pillar).
Recommendation 5: *Tailor several AGILE practices to the constraints of the public sector.*	New recommendation that will be added to the strategic actions in WP6 and to the guidelines in WP7.

***Recommendation 6**: Continue to innovate in the training of the operators and to test interface adaptation depending on the different maturity level.*	New recommendation that will be added to the strategic actions in WP6 and to the guidelines in WP7.

4.4.4. Cross-case analysis

From the three case studies presented above, some cross-case issues have been identified via an analysis of the case study results. Both the specific case study results as well as the recommendations (case specific and general scope) have been compared. Even if these cases all aim at tackling different problems, they face similar cross-cutting issues. These cross-cutting issues are presented in the list below. In essence, nine cross-case issues have been identified:

- Improving data quality: This issue is present in all three case studies and relates to the fact that any form of collaboration relies on the definition and implementation of sufficient data quality requirements, in order for the various partners of the project/case to trust each other and move forward with its roll-out.
- Aiming for interoperability and standardisation: This issue is present in all three case studies and relates to the fact that defining standards and achieving interoperability (whether legal, organisational, technical or semantical) is key in order to develop flexible and innovative public e-services that are useful across organisations and levels of powers.
- Offering trainings to the civil servants: This issue is present in all three case studies and relates to the fact that providing civil servants with sufficient information about the evolution of the tools / services / workflows, and offering accompanying training possibilities to them, is fundamental in order for these civil servants to adapt to the new tools / services / workflows.
- Agreeing on Open Data licences: This issue is common for two case studies (BeSt-Address and Cadastral information) and relates to the fact that the various levels of power need to agree on their Open Data licencing conditions in order to avoid interoperability issues deriving from contradictory provisions in different licences. A common licence will not only reduce the administrative burden on the administrations, it will also stimulate re-use by the external non-governmental users (e.g. private sector).
- Defining authoritative sources of data: This issue is common for two case studies (BeSt-Address and Cadastral information) and relates to the fact that, in order for the cooperation between different levels of power to be efficient, some form of consensus needs to be found on the definition of, and the requirements to be met by, authoritative data sources.
- Improving communication: This issue is common for two case studies (BeSt-Address and Cadastral information) and relates to the fact that improving the communication towards the actors that will have to implement the new tools / services / workflows (and this not only at the end of the development process but also during the development process) is important in order for these actors to feel involved and to have time to plan the necessary adaptations.
- Streamlining cooperation: This issue is common for two case studies (BeSt-Address and Cadastral information) and relates to the fact that, while the various organisations and levels of power already collaborate to a large extent on certain initiatives, the way in which they collaborate could be streamlined in order to ensure more efficiency in the roll-out of the

project, and to build up on successful existing collaborations and best practises.

- **Solving financial shortcomings**: This issue is common for two case studies (BeSt-Address and Emergency services) and relates to the fact that substantive financial resources are often necessary in order to implement the new tools / services / workflows that are being developed. This should be anticipated and taken into account during the development process, in order to ensure that the necessary financial resources will be provided.
- **Increasing user participation and inclusion**: This issue is common for two case studies (Cadastral information and Emergency services) and relates to the fact that ensuring the inclusion of the future users in the development of new tools / services / workflows, and increasing their participation in this development, is essential in order to make these users feel more involved in the transition, which will in turn increase the chance of successful take-up of the development by the field actors.

4.4.5. Report

A detailed overview of the Case Studies can be found in the Work Package 5 'Case Studies' Report published in 2020:

> Chantillon, M., Kruk, R., Simonofski, A., Tombal, T., Crompvoets, J., de Terwangne, C., Habra, N., Snoeck, M., & Vanderose, B. (2020). *FLEXPUB Public e-Service Strategy - Work package 5 – Case studies*. Leuven: KU Leuven Public Governance Institute.

This Report can be consulted via the following link.

4.5. Work Package 6: Strategy for Flexible Geospatial e-Services

4.5.1. Strategy Development

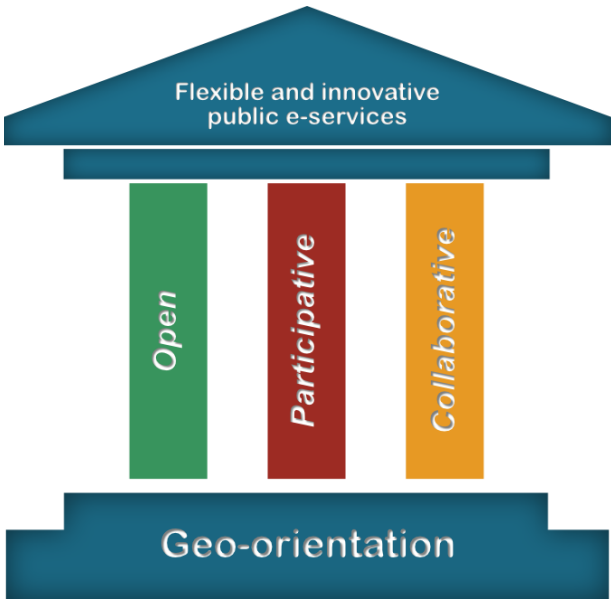
This work package consolidates the outcomes of the Work Package 2, Work Package 3, Work Package 4, and Work Package 5 into a Strategy for Flexible Public Geospatial e-Services of the federal government. The scope of this Strategy is narrowed down to flexible and innovative geospatial e-services, as this is the main focus of the research. This Strategy addresses the changing requirements for e-service delivery (outcome of Work Package 3) as a foundation to achieve the flexible management of public geospatial e-services. The Strategy defines a target vision and objectives in terms of the seven COBIT enablers (Work Package 4) and incorporates the results and lessons from the case studies (Work Package 5).

To guide the federal administration along the way, a ten years (2020-2030) strategy was developed. This Strategy does not only aim to support the offering by the federal administration of e-services in general, but specifically targets location-based e-services, as data and information, and especially geo data and information, are key to offer real-time and valuable services to citizens, businesses and other administrative organisations. This Strategy is envisaged as a framework that aims to establish an environment in which federal organisations and civil servants can reflect on e-government and e-service developments. This framework was built on the basis of existing frameworks, such as the "Open Government Framework" and the findings from the FLEXPUB research.

4.5.2. Strategy Structure

This Strategy framework lays the foundations enabling a federal administration to build flexible and innovative e-services, by relying on three pillars (**Openness, Participation, Collaboration**) and a fundament (**Geo-orientation**), as depicted in Figure 3. Specific actions points were formulated for each of the three pillars and the fundament, the full list of which can be found in the Strategy.

Figure 3: FLEXPUB Strategy Structure



Source: FLEXPUB (2020)

A. Openness

Openness is about sharing information and services as broadly as possible, when possible for free, in a secure and privacy compliant manner, in order to increase transparency and foster economic growth through collaboration and data re-use, and to generate value-added services. It implies fundamental data governance reflections, rather than being content with simply opening data on a portal, as rethinking the whole information management system is a pre-requisite to achieve efficient openness. It also implies finding the right balance between budgetary autonomy and user orientation, namely between free and royalty fees' models, as sufficient funding is necessary to keep the quality of the data, and specifically its up-to-dateness, at an appropriate level.

B. Participation

Participation is about involving all the stakeholders impacted by the digitalisation strategy, by taking into account their evolving requirements, needs, ideas or necessary training. This participation is essential to be able to match the expectations of the stakeholders regarding the e-services. This implies the participation of two main stakeholder groups. The first one is composed of the external users – whether these are citizens or private or public sector organisations –, that have to participate in the development of e-services. Thanks to this participation, the e-services will be better aligned with these stakeholder's requirements and, ultimately, more widely used, not only by tech-savvy people, but by all. The second stakeholder group to consider are the internal public servants whose jobs will evolve due to the digitalisation. As they will interact with

the e-services in the back-office, it is essential to accompany this change with appropriate change management actions.

C. Collaboration

is about the administration's organisations embracing an ever more globalising world and society, in which they no longer act as single actors, but strive from an administration wide perspective towards alliances, cooperation and the sharing of data, tools and capacity to fulfil their tasks and duties towards a variety of stakeholders (public, private and citizens). It implies that federal organisations restructure their cooperation in such a way that a coordinated partnership is established, if need to be with the private sector when relevant. Via those partnerships, a common strategy can be established that guides the federal organisations in the development of their future services. At the same time, there is a need for organisational independence. Federal organisations require sufficient organisational leeway and freedom at project level to fulfil their tasks and duties, including developing their own e-services. Guidance, within the federal administration, by a single organisation, is however necessary to establish a common foundation for all, on top of which each organisation can create innovation and flexibility.

D. Geo-orientation

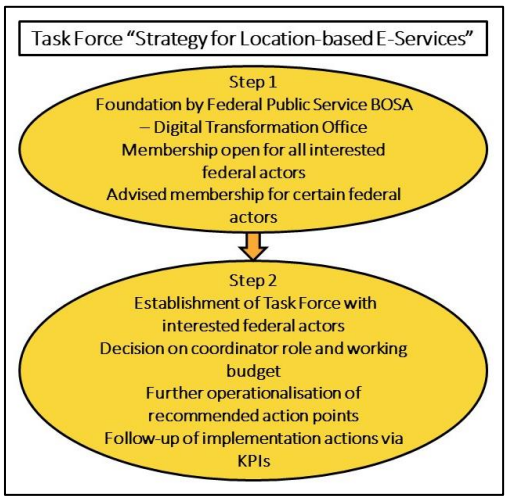
Geo-orientation is about generating added value by answering the increasing demand for real-time and geographical data (hereafter "geo-data"), and location-based services. This is not only relevant within a group of specialised actors, but also for actors from other policy fields, which might not always realise the potential of including a location component in their services. "What?", "When?" and "Where?" are the three simple questions that are to be considered in any e-service offered. In order to achieve geo-orientation, information integration is a necessity. As everything happens somewhere, geo-data and systems help to understand the interrelationships between and among the issues that the administration, businesses and citizens face every day via the integration of information and visualisations based on location. With the emergence of new technologies (including sensors and Internet of Things) and the increasing amounts of data, the need for ubiquitous and authoritative location information is becoming even more pressing.

4.5.3. Strategy Implementation

The framework described above constitutes the **ten years (2020-2030) strategic vision for flexible and innovative e-services** which has been developed in the context of the FLEXPUB project. In order for this strategic vision to be implemented in practice, the research team suggests to work in **three iterative cycles of three years (2020-2023; 2024-2026; 2027-2029)**, in order to be aligned with potential technological or organisational evolutions that might affect the roll-out of the strategy.

Concretely, the research team has suggested, on the basis of preliminary findings, several strategic actions that the federal administrations should start working on during the **first cycle (2020-2023)**, in order to implement the ten years strategic vision. These strategic actions are structured around the three pillars (Openness, Participation, Collaboration) and the fundament (Geo-orientation) of the strategic vision. To implement these, the research team calls for the creation of a Task Force, who should be responsible for the execution of these actions. This Task Force should include the list of key stakeholders, suggested in the Strategy, who strongly need to be involved in the further development and implementation of this Strategy.

Figure 4: Task Force responsible for the implementation of the Strategy



Source: FLEXPUB (2020)

In order to help the Task Force in this endeavour, the research team has outlined strategic priorities to be pursued among the suggested strategic actions for the first cycle, and has highlighted a number of risks potentially preventing the implementation of the suggested strategic actions. This was done on the basis of discussions it has had with the FLEXPUB Follow-Up Committee Members. Naturally, the Task Force shall remain free to depart from these suggestions, and to define its own strategic priorities and risks.

The research team has also suggested a roadmap and key performance indicators to be used by the Task Force in the course of the implementation. This roadmap follows the application of an 'enterprise architecture' methodology. In that regard, The Open Group Architecture Framework (TOGAF) is an excellent lead for implementation of this Strategy. For the Key Performance Indicators (or KPIs), a good practice which can be applied by the Task Force is to monitor the performance of the action points via the SMART Approach. This means that the objectives of the further operationalised action points are set according to the following five principles: Specific, Measurable, Assignable, Realistic and Time-related. Once again, the Task Force shall remain free to depart from these suggestions, and to define its own roadmap and key performance indicators if it realises, during the first cycle, that these need to be adapted.

At the end of this first cycle, the Task Force will have to define the strategic priorities, risks, roadmap and key performance indicators for the **second cycle (2024-2026)**. To do so, the Task Force shall assess the progress made on the strategic actions during the first cycle and the effect that this had in practice. It will also have to assess whether these actions are still relevant and match technological or organisational evolutions. If this is not the case, this Task Force might have to adapt these strategic actions or to suggest new ones.

At the end of the second cycle, the same assessment will have to be done in order to prepare the **third cycle (2027-2029)**. Finally, the **last year (2030)** should be dedicated to the rounding-up of the strategic actions in order to reach the goals set in the ten years strategic vision.

4.5.4. Strategy Publication & Report

A detailed overview of the Strategy, and notably of the suggested Strategic Actions, can be found in Work Package 6 'Strategy for Flexible Geospatial e-Services / Work Package 7 'Blueprint for Adaptive and Innovative Governments' Report published in 2020:

Chantillon, M., Kruk, R., Simonofski, A., Tombal, T., Crompvoets, J., de Terwangne, C., Habra, N., Snoeck, M., & Vanderose, B. (2020). *FLEXPUB Public e-Service Strategy - Work package 6 – Strategy for Flexible Geospatial e-Services / Work Package 7 – Blueprint for Adaptive and Innovative Governments*. Leuven: KU Leuven Public Governance Institute.

This Report can be consulted via the following link.

The Strategy can be consulted via the following link.

4.6. Work Package 7: Blueprint for an Adaptive and Innovative Government

4.6.1. Blueprint Development

The work done in WP 2 (Baseline Measurement), WP 3 (Requirements for e-Service Delivery) and WP 4 (Enablers), was used to prepare a draft Blueprint for an Adaptive and Innovative Government. The goal of this Blueprint is to suggest a vision on the future (of) government. This draft was then revised thanks to the findings of WP 5 (Case Studies) in order to ensure that it is aligned with the reality of the situation on the field.

In the final version of this Blueprint Vision, three strategic areas, nine key principles and thirty strategic actions are suggested to reinforce the administration aiming for an even more adaptive and innovative government. This Blueprint also underlines the benefits that could be derived from the suggested strategic actions (see Section V. of the Blueprint). It builds on the findings of the FLEXPUB project, but also exploits basic fundamental principles for an appropriate relationship between the state, society and citizens. This Blueprint starts from an e-government context, but aims to look beyond it and touch on more essential questions. Technology is, in this respect, only one of the on-going challenges that invite to question the shape of Government, while e-government is only a tool that may help to achieve it.

This Blueprint, which purposely remains more general in scope, originates in the *Strategy for Flexible Geospatial e-Services* (WP 6). Whereas the Strategy is focused on geospatial e-services, this Blueprint takes a broader and wider perspective with a focus on an adaptive and innovative government. The Strategy functioned as a starting point for this Blueprint. As the FLEXPUB research has focused on geospatial e-services, which resulted in the Strategy, this Blueprint is partially based on the assumption that the findings made for geospatial e-services are also relevant for the broader e-service development. In order to be aligned with this Strategy, this Blueprint also follows a ten-year timeline (2020-2030). The year 2030, and the finalisation of the United Nations Sustainable Development Goals, will offer the ideal setting to evaluate the then-achieved position of the State in relation to citizens and society.

The Blueprint has been built on the results of the FLEXPUB Research Project, but also to an important extent on the basis of international and national reports[14]. Indeed, the work of the United Nations and the Organisation for Economic Cooperation and Development has been a source of inspiration as well as the achievements of other European countries. Moreover, the scientific literature has functioned as a source of inspiration for this Blueprint. Finally, the case studies conducted in WP 5 were used as a validation process for both the draft Strategy and

[14] For example the "Open Government Framework" (*Open Government: Collaboration, Transparency, and Participation in Practice*, D. Lanthrop, & L. Ruma (Eds.), 2010, O'Reilly Media, Sebastopol (United States).

Blueprint. The Strategy and Blueprint were then modified on the basis of the results of those three case studies, and of the feedback provided by the Members of the Follow-up Committee, through bilateral interviews.

4.6.2. Blueprint Structure

As said above, the final version of the Blueprint is oriented around three strategic areas. Those strategic areas should allow the government's administration to become more innovative and adaptive. The three strategic areas interact with each other and are complementary. Based on our research, an innovative and adaptive Government...

1. ...is opened towards the outside world. Openness is about sharing information and services as broadly as possible, when possible for free, in a secure and privacy compliant manner, in order to increase transparency and foster economic growth through collaboration and data re-use, and to generate value-added services.
2. ...takes constantly into account the evolving needs from its stakeholders. The participation of stakeholders, whether they are citizen, businesses, societal organisations or civil servants, will enable the Government to make decisions that are more in phase with the currently existing needs and benefits of the stakeholders.
3. ...organises itself on the needs of those it serves. Organisations of the future will continue to provide services, thereby stimulating themselves to constantly reinvent their activities and to motivate societal organisations to do the same. This implies the need to rethink their organisational structures, depending on the service needs. Collaboration is required, implying the need to build bridges, connections and networks between the different layers within and between different administration's organisations.

A. Open Government

Rethinks its information management system

Transitioning towards a truly "Open Government" implies fundamental data governance reflections, as rethinking the whole information management system is a pre-requisite to achieve efficient and effective openness. Indeed, integrated information systems can enable better decision-making and help improve on the public values that the federal administration pursues. Moreover, it can help to identify, in a more timely fashion, relevant datasets requested by re-users. Being "Open" thus requires much more than uploading data on an "Open data" portal; it is a mind-set. Furthermore, such openness may also be required from the private sector. Indeed, there are reflections at the European level on whether data held by private companies, and deemed to be of public interest, should be shared with the administration. Policymaking would strongly benefit from the potential to reuse private sector data.

Ensures sustainable funding for public data quality and up-to-dateness

It also implies finding the right balance between budgetary autonomy and user orientation, namely between free and royalty fees' models, as a sufficient funding is vital to keep the quality of the data, and specifically its up-to-dateness, at an appropriate level. Indeed, the value of the data for re-users is function of its nature (value-added data is more useful than raw data), quality and up-to-dateness, and Government should strive towards meeting these requirements.

Guarantees personal data protection and security

Finally, Government shall take personal data protection and security concerns into consideration from the start when rethinking its information management system. Ensuring maximum privacy for citizens should be the norm (Privacy-by default) and the IT infrastructure should be developed in a way that ensures this (Privacy-by-design).

B. Participative Government

Aligns with internal stakeholders

The digital divide remains a crucial challenge in society. Government must not only tackle it externally but also within the administration. New developments in technologies and the digitalisation will allow it to redesign its processes and organisations. This profound transformation must take place in coordination with the internal stakeholders, in order to decrease their fear of losing jobs and of change in general, and to transform their previous tasks in new ones, with more meaning and added-value. Staff should also be able to acquire the necessary competencies to deal with the new technologies, not only within their own administration, but also at the local level when there is strong interaction with the higher administration.

Integrates the input from citizens and external users

External users, such as citizens and businesses, have higher or new requirements regarding the services provided by the administration but also strive towards being recognised in a pro-active position for the service delivery. Government should organise as a platform to let the interested users take up that role. This proactive role can take several forms, from being a consumer of information to a highly active involvement in the service delivery. Examples of such involvement are app development, service feedback rounds or participation in the development of services. Ultimately, users can also be involved to redefine the role of government, in a broader debate about their needs.

Develops the appropriate methods and tools

Developing a participative strategy internally and externally requires a fundamental change in the existing processes of Government. Government should experiment with existing and new methods to gather the input, whether on a small scale, via group discussions, roundtables, or interviews, or on a large scale, via social media, surveys or online platforms. Those methods should be implemented in a coherent and continuous way, to ensure a lasting impact.

C. Collaborative Government

Rethinks organisational structures to actively serve the end-user

Developing a collaborative approach is a primordial requirement to ensure that Government becomes and acts in a user-oriented way. In turn, it will also stimulate additional collaboration. The inclusion of stakeholders, both governmental and non-governmental, as well as the need to actively provide changing services based on the evolving needs of citizens, businesses and societal organisations can only be achieved by stimulating the collaboration among different societal and government actors.

Strengthens coordination and sharing practices within a single administration

Government has to make use of the digital opportunities to increase the coordination and sharing of data, information and services across different organisations of the same administration. Interoperability, a shared policy and communication approach, and intensified collaboration focused on coordination instruments within the same administration are crucial. This will require the rethinking of currently existing forms of collaboration within the federal administration.

Builds on common service and data approaches to stimulate cooperation across governments

The federal public administration has to collaborate with other public administrations, within and across national borders. A user-centric approach and global challenges force the federal administration to look beyond their own level. The public administration has to develop networks and stimulate participation with partner public administrations. It has to further intensify data exchange approaches (including geospatial data) as well as the development of common services and standards. The further development of the Belgian interoperability framework is highly recommended in this respect, thereby focusing on legal, organisational, semantic and technical interoperability.

D. Benefits of the Strategic Actions

Each of the strategic actions suggested in the Blueprint creates benefits for the Government. These are listed in Section V of the Blueprint. These are built on insights gained from the FLEXPUB project, academic literature, and national and international good practices.

4.6.3. Blueprint Implementation

A. Priorities

In order to help the Government in its transition towards becoming more adaptive and innovative, this Blueprint suggests to start by focussing on some key priorities. These priorities relate to each of the three strategic areas (Openness, Participation and Collaboration), namely: i) Increase the uptake of Open Data (Openness); ii) Strengthen coordination across levels of government (Coordination); iii) Integrate the input from citizens and external users (Participation); and iv) Guarantee personal data protection and security (Openness).

B. Implications

The table in Section V of the Blueprint outlines the positive implications for Government of each of the strategic actions contained in the Blueprint. However, it is also worth pointing out that failing to implement these strategic actions could lead to negative implications such as a lack of economic growth due to weak Open Data re-use and personal data protection; a lack of stakeholder representativeness due to insufficient participation; or a lack of economies of scale in e-service development due to silo culture and insufficient coordination. In this regard, "Work Package 4: Enablers" contains an analysis of the risks that could prevent the implementation of these strategic actions, and of the likelihood of occurrence of those risks (see Table 11 in Section 11. "Risks and Impact Assessment").

C. Key stakeholders & Related Governance Structure

In order to ensure that the Government makes the transition towards becoming ever more adaptive and innovative, key stakeholders are suggested and a governance structure has been prepared. In the first place, it is recommended that the responsibilities related to the Federal

Digital Transformation, the Administrative Simplification and the Federal Innovation are grouped into a single ministerial "wallet", with a Minister dedicated exclusively to these matters. The appointed Minister would be politically accountable for this transition process. Secondly, it is recommended that the FPS BOSA – DG Digital Transformation, the FPS Chancellery – DG Administrative Simplification and SMALS are recognised as key actors in the further development and implementation of this Blueprint. Those three actors are advised to collaborate and to meet each other, in order to determine how this Blueprint for an Adaptive and Innovative Government can be further developed and implemented. Further developing and implementing this Blueprint, will require, from those three actors, an active collaboration with the E-Government Board and the three Colleges, to ensure the support of all federal organisations. Regarding the implementation of the FLEXPUB Strategy, a close collaboration will need to be set-up with the Task Force suggested in the Strategy for Flexible Geospatial Public E-Services. Finally, the politically responsible actors will be responsible for assigning the necessary and required budgetary resources to ensure that the above described actors can take their responsibility and lead the federal administration on the path towards becoming ever more adaptive and innovative.

4.6.4. Blueprint Publication & Report

A detailed overview of the Blueprint, and notably of the suggested strategic actions for Government, can be found in Work package 6 'Strategy for Flexible Geospatial e-Services' / Work Package 7 'A Blueprint on Adaptive and Innovative Government' Report published in 2020:

> Chantillon, M., Kruk, R., Simonofski, A., Tombal, T., Crompvoets, J., de Terwangne, C., Habra, N., Snoeck, M., & Vanderose, B. (2020). *FLEXPUB Public e-Service Strategy - Work package 6 – Strategy for Flexible Geospatial e-Services / Work Package 7 – Blueprint for Adaptive and Innovative Governments*. Leuven: KU Leuven Public Governance Institute.

This Report can be consulted via the following link.

The Blueprint can be consulted via the following link.

4.7. Work Package 8: Toolkit

One of the key goals of the FLEXPUB Research Project was to provide civil servants with hands-on tools and information on how to make use of the recommendations that are put forward in the Strategic Vision (WP 6) and the Blueprint (WP 7). Accordingly, this Work Package aimed to deliver a Toolkit that is useful for the relevant stakeholders, in particular the e-service developers. Via this Report, which functions as a Toolkit Handbook, the research team aimed to support the various stakeholders in the development of flexible and innovative e-services and to offer to stakeholders a highly practical tool, in contrast with the WP6 Strategy and WP7 Blueprint, which have a more strategic nature.

This report functions as a Handbook that compiles different guidelines, instructions, protocols and/or specifications dealing with the flexible management of geospatial e-services or issues related to adaptive or innovative governments. It is written in such a way that it can be easily consulted and provide quick answers to key questions. The three pillars of the WP6 Strategy, i.e. Openness, Participation and Collaboration are used to structure this report. For each of the three pillars, the research team developed a specific tool that can be applied by the stakeholders. Furthermore, for each of the pillars, an overview of good international and national e-service

delivery practices is included, as well as a summary of the various recommendations made in the other WP reports. This Handbook can be used by any public administration with an interest in finding relevant tools (1) on creating more openness in the data it possesses, (2) on stimulating the participation of both internal and external public administration actors (e.g. citizens), and (3) on discovering potential avenues for stimulating the collaboration within the public administration. Each tool in this handbook can be directly used, as there is always a clear explanation of how the tool has been developed, what the methodological approach is behind the tool and how it can be used in practice.

Furthermore, the tools will be taken up by the Belgian Federal Public Service BOSA (Policy and Support Federal Public Service) and will be digitally available via the **Digital Playbook** of the organisation (FPS BOSA, 2019a). More specifically, it will be included in the Toolbox of this Playbook, which offers do-it-yourself tools, which can be accessed via the following website: https://digitalplaybook.belgium.be/nl/tools/tools (FPS BOSA, 2019b).

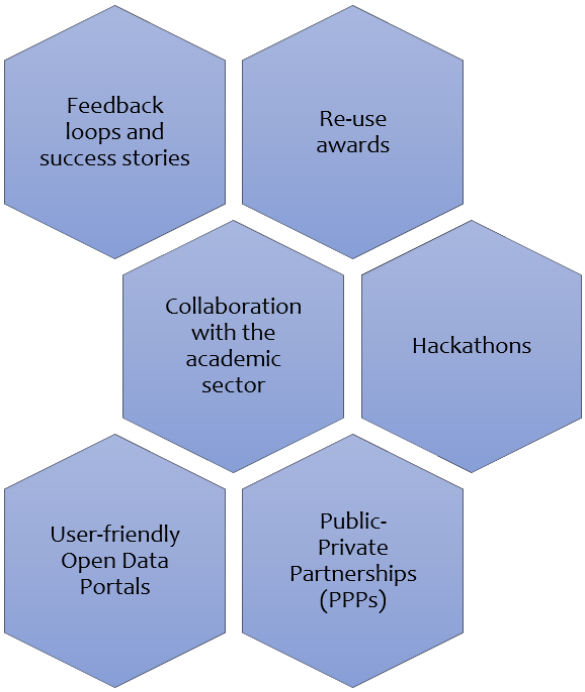
4.7.1 Openness

We suggest, in this Toolbox, a guide to raise awareness about the benefits of Open Data. More specifically, we take the practical viewpoint of an "Open Data officer" within the administration, which has to motivate the other members of his administration to work on the administration's Open Data policy. To do so, raising awareness about the benefits of Open Data is a key challenge, as the civil servants will be more willing to invest their time in this task if they see the positive impact that it has on society at large. This guide to raise awareness about the benefits of Open Data focusses on two aspects. On the one hand, it aims at providing "Open Data officers" with initiatives that could be used in order to raise awareness about the benefits of Open Data within their own administration. On the other hand, it suggests the creation of a structured network involving these "Open Data officers" (sometimes named "Open Data champions"), in order to ensure the better exchange of good practices and success stories between the administrations. Indeed, this network could become a place where good practices and success stories could be exchanged between "Champions", which would then be tasked to relay these best practices in their own administrations, in order to raise awareness about the benefits of Open Data.

A. Initiatives to raise awareness about the benefits of Open Data

While a wide array of initiatives could be taken by "Open Data officers" in their awareness-raising efforts, this guide focuses on six of them, which are summarised in Figure 5 below. Choosing the right tool will be function of the specific environment of the administration, and that there is no "one-size-fits all" solution. Rather, the below initiatives are constructed as a "Menu" in which the "Open Data officers" could select one or several initiatives in light of the specific circumstances of the case.

Figure 5: Initiatives to raise awareness about the benefits of Open Data



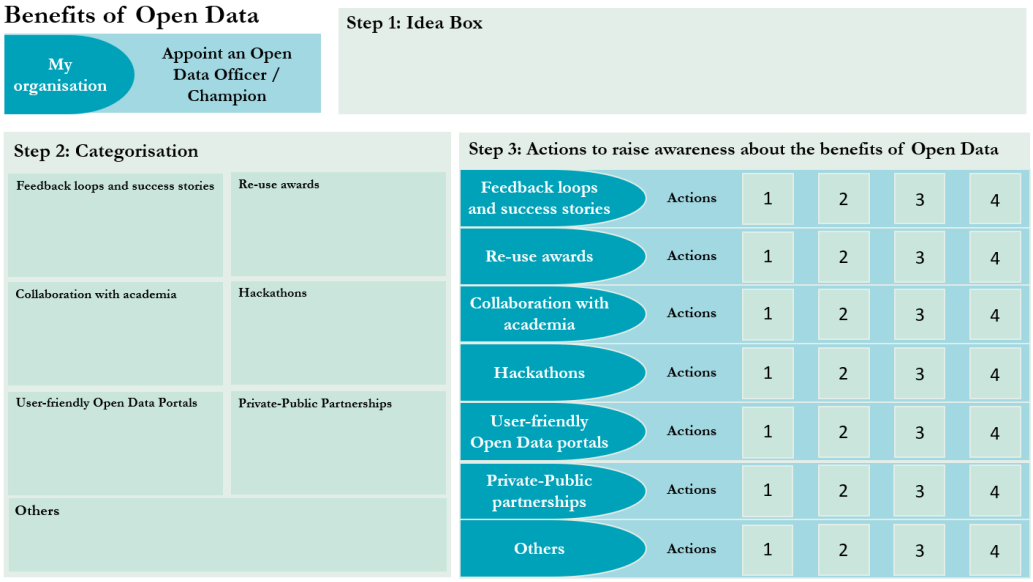
Source: Personal Research (2020)

B. FLEXPUB tool on the benefits of Open Data

In order to assist the Open Data managers in defining the actions that they could undertake in order to raise awareness, within their administration, about the benefits of Open Data, a specific tool has been developed by the research team. It will be made available on the **Digital Playbook of the FPS BOSA**. More specifically, it will be included in the Toolbox of this Playbook, which offers do-it-yourself tools, which can be accessed via the following website: https://digitalplaybook.belgium.be/nl/tools/tools (FPS BOSA, 2019b).

This tool aims at providing a brainstorming framework that can be used by an administration's Open Data officer and selected colleagues in order to come up with, and prioritise, actions that could be used in order to raise awareness about the benefits of Open Data within their own administration. It is designed for 3 to 6 participants and the brainstorming activity should last about one hour. Figure 6 below presents the Template poster to be used by the participants. For a complete description of how this tool can be used, see the Work Package 8 report.

Figure 6: Template Poster for FLEXPUB Tool on the benefits of Open Data



Source: FLEXPUB (2020)

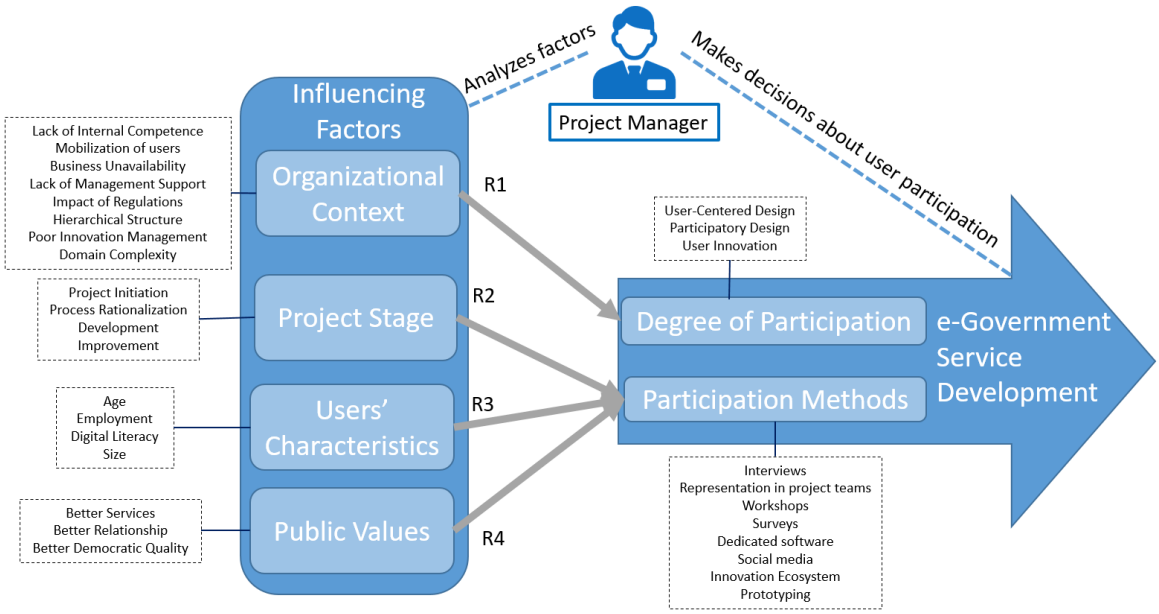
4.7.2. Participation: UParticipate

We suggest a tool to manage the participation of users in e-government service development. It will be made available on the **Digital Playbook of the FPS BOSA**. More specifically, it will be included in the Toolbox of this Playbook, which offers do-it-yourself tools, which can be accessed via the following website: https://digitalplaybook.belgium.be/nl/tools/tools (FPS BOSA, 2019b).

Concretely, we take the practical viewpoint of a public project manager that has to make decisions about user participation in the development of e-government services as a point of departure for designing a decision support guide. This decision support guide aims to help public project managers decide: (1) whether they need to organise for user participation in e-government service development; and (2) on the modalities of user participation, with regard to the context specificities. In order to reach that goal of *situated* user participation (participation that takes into account the context), we presented a conceptual model that constitutes an essential theoretical basis for a decision guide. We also presented how we derived from this model a second management tool: the UParticipate Decision Support Guide. Lastly, we presented an empirical validation of the decision support guide, which provides insights and feedback about its use.

From the literature and the empirical activities, we have chosen to study the influence of four factors (Organisational context, Project Stage, Users' Characteristics and Public Values) on user participation decisions (method and degree) from the viewpoint of a project manager in charge of e-government service development. By factor, we mean "any element, that the project manager may or may not influence, that impacts user participation decisions". The Conceptual Model and its factors are summarised in the Figure below.

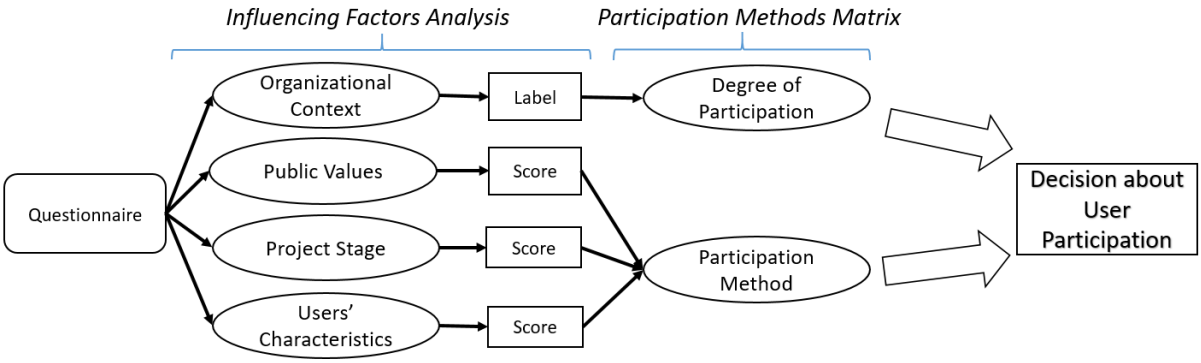
Figure 7: Theoretical Model of UParticipate



Source: Simonofski, Melin, Lindgren, Vanderose, & Snoeck (2019)

The conceptual model helped us build a decision support guide for project managers. This guide was created and improved in close collaboration with project managers through in-depth interviews in order to increase its usability. These interviews helped us understand the requirements of practitioners regarding the guide. These requirements related to the process of the guide, the way to formulate questions and the presentation of the output of the guide. The process for using the decision support guide contains two parts as presented in Figure 8 below; (1) the influencing factors analysis, and (2) the participation methods matrix. For a complete description of how this tool can be used, see the Work Package 8 report.

Figure 8: UParticipate Decision Support Guide Process



Source: Simonofski, Melin, et al. (2019)

4.7.3. Collaboration

It has been decided to include in this Toolbox a number of tools to gain a deeper understanding of: the degree to which the public values individuals/teams/organisations strive for in the execution of their tasks is in line with the public values of their partners; and the potentially relevant coordination instruments to organise the relationship between teams and/or organisations.

Therefore, the research team has designed three FLEXPUB collaboration tools. The first one supports the involved stakeholders in the definition of the balance to be reached between the various public values that are pursued. The second one presents potentially relevant coordination instruments. The third is a public values' definition tool.

A. FLEXPUB collaboration Tool 1: Definition of the balance between public values

This first tool aims to provide the respondent with an analysis of the balance of public values. It will be made available on the **Digital Playbook of the FPS BOSA**. More specifically, it will be included in the Toolbox of this Playbook, which offers do-it-yourself tools, which can be accessed via the following website: https://digitalplaybook.belgium.be/nl/tools/tools (FPS BOSA, 2019b).

By applying this tool, the respondent receives an overview of which public values are least/most important to him/her. Also, this tool is connected to the second tool, which provides advise on the coordination instruments. All public values that are included in this tool have a connection to a coordination mechanism. The tool itself will be digitalised and, as such, will be easy to use for the stakeholder(s). The tool can be used either by an individual, by several individuals of the same organisation, or by several individuals of two or more organisations. However, this tool has high value if several individuals of the same organisation (or team) apply it, and then calculate their overall public values' balance. Indeed, this result provides the team with information on how the public values' balance in the organisation (or team) is structured. This tool has the highest value if the average public values' balance of the organisation (or team) is compared to the average public values' balance of another organisation (or team). For a complete description of how this tool can be used, see the Work Package 8 report.

B. FLEXPUB collaboration Tool 2: Coordination instruments' tool

This second tool aims to provide the respondent with an overview of coordination instruments that can be used. By applying this tool, the respondent will, in the first place, be familiarised with the different existing coordination instruments, and, secondly, will also receive advice on what kind of coordination instruments can be useful for the execution of an e-service project. This tool is strongly connected to the first tool, which provides advice on the public values' balance of the respondent. Indeed, the public values in the first tool are connected to three coordination mechanisms (Hierarchy, Market and Network) and the coordination instruments presented in this tool are connected to the same three coordination mechanisms. As the coordination instruments need to be applied in a specific context, it is important that the respondents answer to the questions of the tool with that specific context, mostly a project, in mind. The tool itself will be digitalised and will be easy to use for the respondents.

The tool can be used either by an individual, by several individuals of the same organisation, or by several individuals of two or more organisations. However, this tool has high value if several individuals of the same organisation (or team) apply it, and then compare their individual results. It can support organisations in finding the required coordination instruments, in detecting underlying requirements via a discussion that follows after applying the tool, and in gaining a better understanding of the need for coordination and of the available instruments. Indeed, this result provides the team with information on how the public values' balance in the organisation (or team) is structured. For a complete description of how this tool can be used, see the Work Package 8 report.

C. FLEXPUB collaboration Tool 3: Public values' definition tool

This tool has a strong correlation to the first tool described above, i.e. Tool 1: Definition of the balance between public values. The tool is based on an existing and tested typology, developed by Jaspers & Steen (2018) and applied by Simonofski, Chantillon, Crompvoets, Vanderose, & Snoeck (2020). The focus lies on three public values' clusters, namely "Better Services", "Better Relationship" and "Better Democratic Quality". This tool will help stakeholders to define what is most important for them to reach, and can help them to further structure the development of their policies and/or services. The first cluster, "Better Services", refers to potential actions of public servants that "decide to include users in order to increase the quality of the service that is provided towards the users". This cluster is externally oriented. The second cluster of public values, "Better Relationship", is focused "on the respect between [...] parties in the development of services". This cluster is internally oriented. Finally, the third cluster, "Better Democratic Quality", refers to the importance of ensuring the quality of democracy by civil servants, and takes a more distant approach then the clusters "Better Services" and "Better Relationship". For a complete description of how this tool can be used, see the Work Package 8 report.

4.7.4. Report

A detailed overview of the Research Tools can be found in the Work Package 8 'Toolkit' Report published in 2020:

> Chantillon, M., Kruk, R., Simonofski, A., Tombal, T., Crompvoets, J., de Terwangne, C., Habra, N., Snoeck, M., & Vanderose, B. (2020). *FLEXPUB Public e-Service Strategy - Work Package 8 – Toolkit*. Leuven: KU Leuven Public Governance Institute.

This Report can be consulted via the following link.

4.8. Side Results

A number of side results, meaning research performed in the context of FLEXPUB but that was not required in the project proposal, was performed during the four years of the research. A number of examples are provided hereunder.

In relation to WP3 – Requirements, it was decided to complement the requirements from public servants, with a questionnaire focused on citizens. The questionnaire has been designed specifically in order to take into consideration the point of view of this important stakeholder group. For the purpose of this project, are considered "citizens" all Belgian citizens that interact with e-government services, excluding however public servants and political representatives. The main goal of this questionnaire is to understand how the citizens would like to be considered in e-government. This research question is designed to understand what citizens expect from e-government. Since we have found several considerations for citizens in literature (citizens as customers, as democratic participants and as participants in delivery process), the questionnaire aims to understand what model they prefer and which characteristics influence this role.

In relation to WP8 – Toolbox, it was decided to also develop other tools to manage participation. Firstly, the CitiVoice Framework summarises several means of enabling citizen participation from different research fields and categorises it under three categories: citizens as democratic participants, citizens as co-creators and citizens as ICT users. Furthermore, these different means of participation are bundled into a framework to compare and evaluate citizen participation in smart cities. This framework has three main uses to manage participation at large scale: it can be

an evaluation tool to determine if a city has implemented participation properly; it can be a governance tool to guide practitioners in their decisions relating to participation; and it can be a comparison and creativity tool to compare best practices among smart cities. Secondly, the SmartCity4All Workshop constitutes an innovative small-scale participation method for involving children (or non-experts) in the smart city. It has three main reported benefits. First, the workshop can impact the children's understanding of the smart city concept. Second, it enables children to debate about the ideal city they would like to live in, and it prepares them to engage in adult participation in the future. Third, it teaches children technological tools to solve urban issues and improve the lives of their fellow citizens. The material for this workshop is available online via the following link: https://school-it.info.unamur.be/smart-city/.

In relation to WP9 – Valorisation, two of the researchers organised, with others, the conference "Vivre la Ville" in 2019 (first edition) and 2020 (second edition). This conference is a pioneering event in Namur. It aims to raise awareness among public agents, politicians, researchers and companies about the themes of the Intelligent Territory and to formulate and co-construct concrete good practices together. Innovative and pragmatic, this day is organised around conferences and workshops aimed at questioning discourses and preconceived ideas on the Smart City on the one hand, and proposing alternative models and operational tools on the other hand. More information about the events can be found via the following link: https://vivrelaville.be/.

Finally, the research team would like to underline that the three PhD researchers (KU Leuven, KU Leuven/UNamur and UNamur) conducted research for their doctoral thesis which is strongly connected to the FLEXPUB research project, but can at the same time also be considered as a side result. The individual doctoral research is strongly related to FLEXPUB, and can provide those interested in the FLEXPUB project, with extra research results and output.

4.9. Policy Support

The aim of this specific section on Policy Support is double. On the one hand, it aims to describe the contribution that the FLEXPUB research project has made to the federal competences. More particularly, it is described how the project has contributed to the actual as well as potential thematic policy processes (preparation, development, implementation and evaluation of policies at international, national, federal, regional and/or local level). On the other hand, this section also looks at specific recommendations for policy support of the Belgian federal administration.

From the start of the FLEXPUB research project, the overall objective has been to develop a Strategy for Flexible Geospatial e-Services as well as a Blueprint for an Adaptive and Innovative Government. Providing policy support to the federal competences has, as such, been the main driver of the project, and has also been realised. The Strategy contributed, from a policy perspective, mainly to the further development and creation of a framework for the federal administration (and its relation to the other Belgian public administrations) concerning geospatial e-services, whereas the Blueprint contributed to the further development and creation of a framework for the general e-government policy of the federal administration (and its relation to the other public administration).

Besides those two main documents, which are related to WP6 and WP7, specific policy support has also been provided through the other Work Packages. WP2 Baseline Measurement provided the federal administration, as well as the other Belgian public administrations, with a detailed overview of the current 'as-is' situation of the (geospatial) e-service landscape. The combination

of those results with those of WP3 Requirements for e-Service Delivery, have been presented in detail to the different Members of the Follow-up Committee, and led to a realisation and increased sense of urgency within the federal administration, regarding the current requirements.

WP4 Enablers is the result of ongoing discussions with the federal administration as well as the other Belgian public administrations. Whereas the final outcome of WP4, i.e. the report, has only been published in 2020, the strong interaction with the federal administration led to a role as policy advisors for the FLEXPUB research team. Indeed, when there were meetings, the project outcomes were always discussed and relevant advice was provided to the public administrations.

Besides the very strong policy support provided via WP6 Strategy and WP7 Blueprint, also WP5 Case Studies has been highly important from a policy support perspective. Via the case studies, specific domains could be studied, which resulted in a close collaboration with the federal and other Belgian public administrations. For each of those cases, specific recommendations have been made towards the involved federal, regional and local organisations.

Moreover, WP8 Toolbox aims to provide specific support to the federal administration. In this respect, it is important that no specific vertical policy support has been provided, but that specific tools have been developed for the public administration to support their policy-making process. In order to ensure a wide use of the created tools, they will be taken up by FOD BOSA, and will be found on the Digital Playbook hosted and managed by FOD BOSA. This Digital Playbook aims to support federal organisations in their digital transformation process. The uptake by FOD BOSA is, as such, a directly visible policy support to the federal administration. The tools can be found on the Digital Playbook website: https://digitalplaybook.belgium.be/nl.

Besides those specific research activities, which all provided in a certain way – sometimes directly, sometimes indirectly – policy support, the activities in WP9 and WP10 have been of high importance for the provision of support. The different activities, described in "Section 5. Dissemination and Valorisation", have all contributed to the policy that is being made within the federal administration, as well as to the creation of a community of civil servants that know each other, which can in turn lead to an improved policy. Whereas the workshops focused on specific thematic topics, the two General Assemblies have contributed to a wide dissemination of the research results to the highest policy level within the federal administration, as well as the Belgian regional administrations.

Additionally, the traineeship of one the team members in the European Commission, and more specifically DG DIGIT – ISA² Unit, which is focused on interoperability, made it possible to feed the findings of the FLEXPUB research project into the European level, and to draw the attention of EU policy officers to the ongoing work within the Belgian federal and regional administrations. Especially the work on authoritative sources and legal interoperability, respectively conducted by the federal administration and the Flemish regional administration, has drawn strong interest from the EU policy officers.

Finally, it has to be underlined that the constitutions of a project such as FLEXPUB has been of strong important for the effect that it can have on the federal administration. Indeed, the intense collaboration between three university partners and one federal organisation, i.e. the National Geographic Institute, has been highly useful to stimulate the policy support. The National Geographic Institute, and in particular the project members, have been strong ambassadors of the

project, and have been able to disseminate, both directly and indirectly, the results within the highest levels of the federal administration.

The project has now delivered both a Strategy and Blueprint, with governance structures and key stakeholders included in it, and it will know be up to the federal administration to implement the results of the research.

5. DISSEMINATION AND VALORISATION

An important aspect of the FLEXPUB Research Project was the dissemination and valorisation of the research results. As underlined in the introduction, the valorisation and dissemination of the research results is important not only from a public sector perspective, but also for the wider social community as well as the academic community. This valorisation refers to the use of the content of the project results by (potential) beneficiaries, while taking into account project limitations and related implementation uncertainties. The main project results to be valorised are the Strategy for the Flexible Geospatial e-Services and the Blueprint for Adaptive and Innovative Government. Also the deliverables of the toolkit serve as practical guides and tools mainly for the key stakeholders. The valorisation includes the following activities: The organisation of a general assembly and user workshops, presentations at important governmental platforms, meetings with members of the follow-up committee, and the statement document. Besides the valorisation activities, the FLEXPUB research project has intensively focused on the dissemination of the research results. The dissemination refers in particular to the activities for those stakeholders who might not otherwise have access to the project information, results and/or deliverables. These activities refer to the set-up and maintenance of the project website, the publications, the presentations for professionals, and the material for lectures notes.

5.1. Valorisation Activities

The valorisation activities were the following: the organisation of two general assemblies and of user workshops, presentations at important governmental platforms, meetings with members of the follow-up committee, and the statement document.

5.1.1. General Assembly I - Digital Innovation: Status of the Public Sector in Belgium (15/6/2017)

The first General Assembly was organised in light of the FLEXPUB research project focused on the status of the digital innovation of the Belgian public sector. This topic was chosen as it suited with the project timeline. At that moment, the researchers had obtained a well-grounded overview of the activities related to the (geospatial) e-service innovation at the Belgian federal level as well as within the other Belgian public administration, notably the Brussels Capital region, the Flemish region and the Walloon region.

Mrs. Ingrid Van den Berghe, Head of the NGI and member of the FLEXPUB project team, was the chair of the day. Besides five presentations that covered the federal, Walloon, Flemish and European levels as well as the judicial connection between personal data protection and e-government, the researchers were able to ensure the presence and participation to the event by federal Minister Alexander De Croo, at that time responsible for the federal digital agenda. Minister De Croo shared his views on the future digitalisation of our society, thereby underlining the need for creativity from a human perspective. Although technological advancements and the future digitalisation might lead to the loss of certain job positions, the Minister underlined that human beings will always be the driver of change as a result of our capacity to think in a creative way and to innovate. The General Assembly also included a panel discussion with all the aforementioned guest speakers and with Mr. Steven Lierman (Instituut voor Administratief Recht – KU Leuven) on the topic of digitalisation in the Belgian context. It was an interactive debate during which the participants could vote on a number of statements via a digital tool. This allowed for interaction with the audience.

The event was organised on 15 June 2017 at the Palace for Arts & Sciences (Koninklijke Vlaamse Academie van België voor Wetenschappen en Kunsten) in Brussels. It was attended by 128 participants from the public, private and academic field. The public sector was the main target group, and the team managed to have representatives from all administrations – ranging from the local up to the European level. As the FLEXPUB project focuses mainly on the federal level, it was reassuring to see the strong interest from federal participants in the topic of digitalisation in the public sector.

Overview of the program (in English):

13:00 - 13:30	**Welcome**
13:30 - 13:40	**Opening speech** Mme. Ingrid Vanden Berghe, General-administrator of the National Geographic Institute
13:45 - 15:30	**Innovative numeration of the Belgian public sector** • Mr. Ben Smeets, FPS BOSA – Digital Transformation Office • Mr. Bernard Dubuisson, e-Wallonie Bruxelles Simplification • Mr. Björn De Vidts, Agentschap Informatie Vlaanderen • Mme. Andrea Halmos, European Commission • Prof. dr. Cécile de Terwangne, Université de Namur – CRIDS
15:30 - 16:30	**Debate** Debate, with participation from the public, between the above speakers and Mr. Frank Robben (Administrator-General of the CBSS) and prof. Dr. Steven Lierman (Instituut voor Administratief Recht – KU Leuven).
16:30 - 16:50	**Closing speech** Mr. Alexander De Croo, Vice-prime minister and minister for the Digital Agenda
16:50 - 18:00	**Reception**

5.1.2. General Assembly II – A Strategy for Flexible Geospatial Public e-Services (18/11/2020)

The second General Assembly organised by the researchers of the FLEXPUB project focused on the final results of the four-year research. More specifically, it aimed at presenting the "Strategy for Flexible Geospatial Public e-Services in the Belgian federal" to Belgian civil servants coming from the Federal level, as well as from the Brussels Capital region, the Flemish region, the Walloon region and the local level.

After an opening speech by Prof. dr. Ir. Joep Crompvoets, coordinator of the FLEXPUB project, the FLEXPUB team presented its final Strategy to the audience. During the presentation, the focus was set on the recommendations stemming from the three pillars (Openness, Participation and Collaboration) and the fundament (Geo-orientation) of the Strategy. Then, the floor was given to four external commentators, who commented on each of the pillars of the Strategy and on its concrete implementation in the future. After comments by Prof. dr. Catherine Elsen on the Participation pillar, by Mr. Erwin de Pue on the Openness pillar, and by Prof. dr. Ir. Marijn Janssen on the Collaboration Pillar, Mr. Ben Smeets provided his comments on the overall Strategy, and made links with the Policy note of the Secretary of State for the Digital Agenda (Mr. Mathieu

Michel), which had agreed to give a speech during the General Assembly, but had to cancel due to other obligations. A discussion with the audience then ensued on the basis of the presentations. Then, to conclude the event Mrs. Ingrid Van den Berghe, Head of the NGI and member of the FLEXPUB project team, addressed the importance of location-based data and outlined that it is a fundament to FLEXPUB's strategy. Finally, Mr. Aziz Naji, Research programs coordinator at BELSPO, drew some further conclusions as to the future of the research financed by BELSPO and how the FLEXPUB Strategy could be an important tool to identify such areas of further research.

Due to the Covid-19 sanitary crisis, the decision was taken to organise the event digitally. Nevertheless, 137 people registered to follow the event online. These participants mostly came from Federal administrations, but an important number of participants from the administrations of the other levels of power (European, Regions, Communities, local level) also followed the event, as well as participants from the private and academic field. The public sector was the main target group, and the team managed to have representatives from all. As the FLEXPUB project focuses mainly on the federal level, it was reassuring to see the strong interest from federal participants in obtaining the results from the team's work on the Strategy.

Overview of the program (in English):

<table>
<tr><td>13:00 – 13:15</td><td colspan="2">Opening speech by Prof. dr. Ir. Joep Crompvoets, Coordinator of the FLEXPUB project – KU Leuven

and Mathieu Michel State Secretary for Digitisation, with responsibility for Administrative Simplification, Privacy, attached to the Prime Minister, represented by Ben Smeets</td></tr>
<tr><td>13:15 – 13:40</td><td colspan="2">Presentation of the Strategy for Flexible Geospatial Public e-Services (by the FLEXPUB Team)</td></tr>
<tr><td rowspan="5">13:40 – 14:30</td><td>A point of view on the Strategy by:</td><td>With a focus on:</td></tr>
<tr><td>• Prof. dr. Catherine Elsen, specialised in Urban Planning & Participatory Design – Faculté des Sciences appliquées – Université de Liège</td><td>Pillar Participation</td></tr>
<tr><td>• Mr. Erwin De Pue, Director-General of the Agency for Administrative Simplification – FPS Chancellery</td><td>Pillar Openness</td></tr>
<tr><td>• Prof. dr. Ir. Marijn Janssen, specialised in ICT & Governance – Faculty of Technology – TU Delft</td><td>Pillar Collaboration</td></tr>
<tr><td>• Mr. Ben Smeets, President a.i. FPS BOSA, Director-General a.i. DG Digital Transformation</td><td>The whole Strategy</td></tr>
<tr><td>14:30 – 14:50</td><td colspan="2">Q&A Session</td></tr>
<tr><td>14:50 – 15:00</td><td colspan="2">Closing speech by Mme. Ingrid Vanden Berghe, General-Administrator of the National Geographic Institute; and Mr. Aziz Naji, Research programs coordinator, BELSPO.</td></tr>
</table>

5.1.3. Workshop I – Workshop on Co-Creation of Guidelines for an Open and Agile Administration (1/10/2018)

On 1 October 2018, the team organised at the BELSPO Premises a Workshop on the Co-Creation of Guidelines for an Open and Agile Administration. During the workshop, the team aimed to create guidelines for an open and agile administration for the development of public e-services. The FLEXPUB research data served as a basis for a collective thinking and reflection exercise whereby the participants had the possibility to share their ideas in an interactive way.

Each participant participated in two sessions:

- Session 1: The use of agile methods in the public sector
- Session 2: Open data and the sharing of geospatial data

The afternoon went as follows:

- General Introduction by the FLEXPUB Team and Mrs. Ingrid Vanden Berghe, president of the G-Cloud Board
- Session "Open data and the sharing of geospatial data"
- Session "The use of agile methods in the public sector"
- Reception

Although the number of registrations was high for this workshop – around 25 registrations – the number of actual participants was limited with only 12 participants.

5.1.4. Workshop II – The Revised PSI Directive & Open Data (29/9/2019)

On 26 September 2019, a Workshop was organised in Leuven on the revised PSI Directive and the influence this revision will have on the Open Data policy of the various public administrations in Belgium. This Workshop was a highly timely event as the European Parliament and the European Council agreed on the revised version of the Directive only in June 2019. The Workshop started with an introduction of the revised PSI Directive and more in particular what stayed the same and what changed in the revised version of the Directive. Afterwards, three speakers gave the administrations' view on the revised PSI Directive and in particular the influence this could potentially have on their Open Data policy. In the second part of the workshop, the participants were divided in four groups and discussed, under the guidance a FLEXPUB researcher, the potential added value of Open Data.

The participation rate for the event was high, in total 51 participants attended the workshop. Participants worked for the public sector – all different layers –, the private sector and the academic sector.

Overview of the program (in English):

13:30 - 14:00	**Welcome**
14:00 - 14:30	**"Presentation of the PSI Directive revision: What's new?"** Thomas Tombal – UNamur – CRIDS
14:30 - 15:30	**"How does my administration view the PSI Directive Revision? How to go forward?" (Testimonies from field experts)** • Jean-Charles Quertinmont – Agency for Administrative Simplification – FPS Chancellery

	• Mathias De Schrijver - Agentschap Informatie Vlaanderen • Stephane Vince – Agence du Numerique (Wallonie)
15:30 - 16:00	**"The added-value of Open Data": Interactive session**
16:00 - 16:45	**Networking**

5.1.5. Workshop III – Workshop Federal Innovation Network (11/10/2019)

On 11 October 2019, the FLEXPUB team organised a Workshop for the Federal Innovation Network. This Network consists of federal civil servants and employees who seek to learn more about innovation, with a particular focus on the Belgian federal administration. Participants have a middle management profile, and therefore have knowledge of the daily practicalities of their own services while at the same time also being able to see the broader picture of how the federal administration functions. Most participants received general information on the FLEXPUB project via previous meetings with the FLEXPUB researchers, their own colleagues or via public events where the FLEXPUB researchers presented the research (e.g. Begeo / INSPIRE Conference). This allowed the researchers to focus in their presentation on the development of the identified requirements and enablers, the Strategy and the Blueprint. Once the presentation was finished, the interactive workshop took place whereby the participants were asked to identify, on the basis of the FLEXPUB research outcomes and the Strategy / Blueprint recommendations, concrete examples of their own daily working environment. Although only ten civil servants / employees of federal administrations participated in the Workshop, the level of interaction was high and the outcome was successful.

Overview of the program:

13:30 - 14:00	**Registration & welcome**
14:00 - 14:20	**Presentation of the FLEXPUB Research Project:** • Requirements & Enablers • Strategy • Blueprint
14:20 - 15:15	**Interactive Session: How are the Strategy / Blueprint recommendations useful in your daily working environment? Discussion on the basis of daily examples.**

5.1.6. Workshop IV – Workshop Begeo 2020 and Geo-spatial awards (24/3/2020)

A fourth Workshop was planned to take place at Begeo 2020 (24 March 2020). Due to the COVID-19 pandemic, and the measures taken by the Belgian National Security Council, the event was cancelled and postponed to a later date, i.e. 27 October 2020.

Via the planned workshop the team intended to gather, from the various participants, their input and feedback on the redesigned FLEXPUB Strategy. First the team intended to present, in a brief way, the FLEXPUB project. Afterwards, the participants were going to be asked to rank the different suggested modifications. In this way, it would have been possible to understand what the different stakeholders find important and less important.

Nevertheless, the FLEXPUB project was nominated for the Geo-spatial awards, organised as part of Begeo. The team thus presented the results of the research on the 20th of October 2020.

5.1.7. Extra event: Study day: PSI & Open Data (18/11/2020)

On 18 November 2020, the FLEXPUB Research Team organized, in collaboration with FLAGIS, the Flemish Association for Geographic Information Systems, a study day on the revised PSI Directive and open data. In particular attention was devoted to the impact of the revised PSI Directive on the current open data policy of the Belgian public administrations and the changes expected to the Belgian legal framework(s). The session was chaired and moderated by prof. dr. ir. Joep Crompvoets. Around 45 participants attended the online event.

10:00 - 10:05	**Verwelkoming**
10:05 – 10:35	**Introductie tot de herziene PSI Richtlijn: Wat blijft, wat verandert?** De heer Thomas Tombal, Onderzoeker bij Université de Namur – CRIDS
10:35 – 11:00	**Stand van zaken bij de besprekingen over de lijsten van " Hoogwaardige gegevensbestanden".** De heer Jean-Charles Quertinmont, Attaché bij FPS Kanselarij – Agentschap voor Administratieve Vereenvoudiging
11:00 – 11:25	**Open (geo-)data in Vlaanderen: huidige praktijken en het effect van de herziene PSI Richtlijn** De heer Tom Callens, Adviseur Informatiebeleid bij Informatie Vlaanderen & De heer Mathias De Schrijver, Analist ICT Strategy bij Informatie Vlaanderen
11:25 – 11:55	**Q&A Sessie**
11:55 – 12:00	**Afsluiting**

5.1.8. Presentations at Government Platforms

Kruk, R.W., Chantillon, M. (2017). FLEXPUB – *The next generation of flexible e-service delivery, the case of geospatial information, and the position of the NGI within the administration.* Presented to the employees of the NGI, 8 June 2017. (professional oriented).

Chantillon, M., Crompvoets, J. (2018). *Organisatiecultuur, publieke waarden en de toekomstige manier van werken*. Presented at the FOD Mobiliteit & Vervoer: Conferentiecyclus Let's Talk, FOD Mobiliteit & Vervoer, Brussel, Belgium, 25 Sep 2018-25 Sep 2018.

Crompvoets, J., Chantillon, M., Wouters, S., Kopczewski, D., Cory, M. (2018). *Authoritative Data in a European context: An exploratory study.* Presented at the Eurogeographics General Assembly 2018, Prague, Czech Republic, 07 Oct 2018-10 Oct 2018. (professional oriented).

Chantillon, M., Crompvoets, J., Peristeras, V. (2018). *Digitale transformatie & flexibiliteit: De rol van publieke waarden*. Presented at the Symposium Digitale Transformatie, KU Leuven, Provinciehuis Vlaams-Brabant, Leuven, Belgium, 11 Dec 2018-11 Dec 2018. (professional oriented).

Chantillon, M., Crompvoets, J., Peristeras, V. (2019). *Het prioriteren van publieke waarden: De aanwezigheid van publieke waarden in (geo) e-government beleid*. Presented at the BEGEO 2019, Brussels, 19 Mar 2019-19 Mar 2019. (professional oriented).

Crompvoets, J., Wouters, S., Chantillon, M., Kopczewski, D., Cory, M., Agius, C., Grimmelikhuijsen, S. (2019). Authoritative Data in a European Context - Final Report & Conclusions. Presented at the EuroGeographics Extraordinary General Assembly 2019, Leuven, 14-15 May 2019. (professional oriented).

Chantillon, M., Kruk, R.W.., Crompvoets, J., Simonofski, A. (contr.), Tombal, T. (contr.) (2019). FLEXPUB: Developing a Strategy for Flexible and Innovative Public e-Services. Presented at the Federal Innovation Network, Brussels, 11 October 2019. (professional oriented).

Chantillon, M. (2020). Public Values, Governance and e-Government. Presented at the European Commission DG DIGIT ISA² Unit Event, online, 9 June 2020. (professional oriented).

Chantillon, M., Kruk, R.W., Simonofksi, A. (2020). FLEXPUB – A Strategy for Flexible Geospatial e-Services – 2020-2030. Presented at the NGI Comité van Beheer / IGN Comité de Gestion, online, 23 November 2020. (professional oriented).

5.1.9. Follow-up Committee Meetings

In line with the project requirements, the FLEXPUB researchers organised two FLEXPUB Follow-up Meetings in each project year. A detailed Report of each Follow-up Committee Meeting has been submitted to BELSPO, together with the supporting material.

The meetings of the Follow-up Committee took place on the following dates and locations:

Follow-up Committee Meeting	Date	Location
Year I – Meeting I (Kick-off Meeting)	22 June 2016	BELSPO Premises
Year I – Meeting II	21 November 2016	NGI Premises
Year II – Meeting I	18 May 2017	BELSPO Premises
Year II – Meeting II	20 November 2017	BELSPO Premises
Year III – Meeting I	28 May 2018	BELSPO Premises
Year III – Meeting II	22 January 2019	BELSPO Premises
Year IV – Meeting I	7 November 2019	BELSPO Premises
Year IV – Meeting II	31 March 2020	Online bilateral Meetings[15]

5.1.10. Statement Document

Originally, the research Team had intended to draft a "Statement Document", to be signed by the heads of key Belgian administrations for the dissemination of the Strategy, such as FPS BOSA, and potentially also by the relevant Ministers, at the end of the second FLEXPUB General

[15] Due to the measures taken by the Belgian National Security Council in light of the COVID-19 outbreak, the meeting of the FLEXPUB Follow-up Committee could not be held as planned originally. As this meeting was important for the preparation of the final Strategy (WP6) and Blueprint (WP7) it was decided to organise digital bilateral meetings with the Members of the Follow-up Committee.

Assembly. This signing of the "Statement Document" would have been the occasion for those key actors to endorse the recommendations made by the FLEXPUB team and to promote their concrete implementation. Unfortunately, due to the Covid-19 crisis, it was not possible to organise the General Assembly physically, and it was thus not possible to organise the signing of a "Statement Document".

5.2. Dissemination Activities

These activities refer to the set-up and maintenance of the project website, the publications, the presentations for professionals, and the material for lectures notes.

5.2.1. Project Website

A website was created in collaboration with Mr Gérard Frère (NGI – Administrative ICT Expert). Via the website it was possible to reach a wider audience. The website aimed at presenting the latest advancements of the project (Work package reports, documents, events, news etc.). The FLEXPUB researchers mainly used the website as a platform to disseminate relevant documents prepared during the project. It also presents the team and the project partners. A feedback loop was built into the website via the contact page. The researchers checked on a regular basis the specifically created mailbox.

Since the project has come to an end, it was decided to close this website, and to integrate all the relevant information related to the project into a specific webpage dedicated to the FLEXPUB project, hosted on the KU Leuven servers. Integration in the KU Leuven servers ensures that the material will remain available in the future. The webpage can be accessed via the following link: https://soc.kuleuven.be/io/flexpub/flexpub. The webpage is also accessible via www.flexpub.be.

5.2.2. Publications

The FLEXPUB researchers would like to refer to Section 7. References for a complete overview of all publications produced throughout the FLEXPUB Research Project.

5.2.3. Presentations for Professionals

- On 16 March 2017, Maxim Chantillon, Rink Kruk, Anthony Simonofski and Thomas Tombal presented the preliminary results of the FLEXPUB online survey at the BeGeo Conference 2017 in Brussels.
- On 23 March 2017, Maxim Chantillon, Rink Kruk and Thomas Tombal presented the preliminary results of the FLEXPUB project at the plenary meeting of the "GTi Transition numérique" in Brussels.
- On 20 April 2017, Anthony Simonofski and Thomas Tombal gave a three-hour module presentation on the topic "Smart Governance & Droit des TIC", as part of the continuous education program "Management des Smart Cities", organised by the Smart City Institute of the HEC Liège in Liège.
- On 29 June 2017 a Scientific Exchange & Collaboration Meeting was organised between the KU Leuven Public Governance Institute (Belgium) and TU Delft (The Netherlands) where Maxim Chantillon presented the FLEXPUB project and his PhD research. This meeting took place in Leuven.
- In July 2017 Anthony Simonofski presented the paper "Citizen Participation in Smart Cities: Evaluation Framework Proposal" at the 19th IEEE Conference on Business Informatics, in Thessaloniki (Greece).

- In August 2017 Anthony Simonofski presented the paper "Re-examining e-Participation: A systematic literature review on citizen participation in e-government" at the 23rd Americas on Information Systems, in Boston (USA).
- From 29 August to 1 September 2017 Maxim Chantillon attended the EGPA Conference 2017 in Milan (Italy) where he presented a paper on e-governance in the Belgian context.
- From 5 to 8 September 2017 Maxim Chantillon, Anthony Simonofski and Rink Kruk attended the INSPIRE Conference on geospatial data and e-services in Strasbourg (France) where they presented the identified e-government challenges.
- On 21 September 2017 Maxim Chantillon and Anthony Simonofski presented and led a discussion group at the FLAGIS Netwerkdag: "Smart Ideas and Smart Solutions" that took place in Leuven.
- From 1 October to 3 October 2017 Thomas Tombal and Joep Crompvoets attended the EuroGeographics General Assembly in Vienna (Austria) where Thomas presented "The legal challenges of the Internet of Things".
- On 26 October the team had a second meeting, in Brussels, with Proximus to discuss the overall project and possible connections for future collaboration on geospatial data and e-services. The first meeting took place in January 2017.
- From 9 October to 13 October 2017, Joep Crompvoets and Maxim Chantillon attended and co-organised the a training session on "Digital Transformation in the Public Sector" for CIOs (Thessaloniki, Greece), where Joep Crompvoets gave a presentation on public governance structures.
- On 20 October 2017, Thomas Tombal gave a presentation on the topic "Droit d'auteur et œuvres générées par la machine", during the "Conference @ CRIDS", organised by the CRIDS in Namur.
- On 25 October 2017, Maxim Chantillon gave a lecture on agile and flexible administration at the KU Leuven (Leuven) to students of the PIONEER program, a master study program aiming to train students on public sector innovation and e-government which is funded by the European Commission.
- On 21 November 2017, Maxim Chantillon gave a lecture, together with Stijn Wouters (KU Leuven) on the meaning of the concepts "e-government" and "e-governance" to students of the PIONEER program, a master study program aiming to train students on e-government which is funded by the European Commission. The lecture was given in Leuven.
- On 1 February 2018, Thomas Tombal gave a three-hour module presentation, together with Annick Castiaux (UNamur), on the topic "Smart Governance & Droit des TIC", as part of the continuous education program "Management des Smart Cities", organised by the Smart City Institute of the HEC Liège in Liège.
- On 5 February 2018, Thomas Tombal gave a presentation, together with Jean-Benoît Hubin (CRIDS), on the topic "Droit d'auteur et intelligence artificielle", during the "Lunch-causerie" organised by the Belgian Association for Copyright (BVA-ABA) in Brussels.
- On 13 March 2018, Thomas Tombal gave a presentation on "Les droits des personnes concernées" during the seminar for SMEs: "RGPD: et si on s'y mettait ?", organised by the CRIDS.

- On 15 March 2018, Thomas Tombal gave a presentation about the "Legal challenges of the use of (geo) sensor data" during the FLAGIS (Flemish Association for Geographic Information Systems) Study day "GDPR & Geodata".
- On 19 March 2018, Thomas Tombal gave a presentation on "RGPD, de quoi parle-t-on?", during the study day "Mise en conformité au RGPD", organised by the Union des Villes et Communes de Wallonie (UVCW).
- On 24 March 2018, Rink Kruk introduced the Flemish Geography Teachers (and their teachers) to the FLEXPUB project and the way to go for a more flexible and innovative (e-)Government and a defragmented location-based data landscape, at the Conference of the Flemish Geography Teachers Association (VLA) that celebrated its 40 years existence, with as central theme the development of a new geography curriculum at high schools.
- On 30 March 2018, Thomas Tombal gave a presentation on "Open Data", for the class "Gouvernance de l'Internet et E-Gouvernement", given by Pr. Elise Degrave, in the LL.M. in ICT Law of the UNamur.
- On 24 April 2018, Thomas Tombal participated as a speaker to the panel "Intelligence géospatiale: limites légales et acceptabilité sociale", during the BeGeo conference, organised by the NGI and Agoria.
- On 24 April 2018, Thomas Tombal gave a presentation on the "Legal implications of IoT & use of sensor data", during the BeGeo conference, organised by the NGI and Agoria.
- On 24 April 2018, Rink Kruk attended the bilateral meeting with the Netherlands for a crossbreed in Innovation in the Geospatial Sector, where he briefly presented FLEXPUB and the use case “Uniform Cartography for Emergency Services”, which was hosted by the Cluster for Innovation in Defense, Safety and Security (CIDSS), during the BeGeo conference organised by the NGI and Agoria
- On 28 April 2018, Thomas Tombal gave a presentation on "Open Data - Legal viewpoint" during the 4th B-SCAN meeting « Hackathon and Open Data: Between practices and theories », organised by the Smart City Institute of the HEC Liège. Anthony Simonofski attended this workshop as well.
- On 4 May 2018, Thomas Tombal participated as a speaker to the panel "Open data, une source d’information à laquelle je peux contribuer et que je peux exploiter en tant que citoyen ?", during the Evolu'TIC fair, organised at Namur Expo.
- On 4 May 2018, Anthony participated as a speaker to the panel "Participation Citoyenne", during the Evolu'TIC fair, organised at Namur Expo.
- On 1 June 2018, Thomas Tombal gave a presentation on "Les droits des personnes concernées" and on "Les flux transfrontières de données" during the seminar for SMEs: "RGPD: et si on s'y mettait ?", organised by the CRIDS.
- On 13 June 2018 Maxim Chantillon gave a presentation on “Explaining the role of public values in SDIs: The need for further research” during the conference “AGILE 2018” organised by the Lund University (Sweden).
- On 14 June 2018, Maxim Chantillon, Rink Kruk, Anthony Simonofski and Thomas Tombal gave a presentation on “FLEXPUB – New Generation of Flexible Public Services (2016-2020)” during the URBIS Users-club, organised by the Brussels Regional Informatics Centre (BRIC).

- On 18 June 2018 Maxim Chantillon gave a presentation on his ongoing PhD Research during the Joint PhD Conference, organised by KU Leuven Public Governance Institute, IDHEAP and the Université Aix-Marseille.
- On 26 June 2018, Thomas Tombal gave a presentation (with C. Colot, I. Linden and J.M Van Gyseghem of the UNamur) on "Data sciences: opportunités managériales et risques juridiques", during the IBM Chair in Data Sciences, organised by the UNamur.
- On 16 august 2018, Anthony Simonofski presented the paper "From Traditional to Agile E-Government Service Development: Starting from Practitioners' Challenges" at the Americas Conference of Information Systems in New Orleans.
- On 3 September 2018, Anthony Simonofski presented his PhD proposal at the PhD Colloquium of the e-Gov/CEDEM/ePart conference in Krems, Austria.
- On 5 September 2018 Maxim Chantillon gave a presentation on "Connecting public values with e-government" during the conference "EGPA 2018 Conference" organised by the European Group on Public Administration.
- On 14 September 2018 Maxim Chantillon gave a presentation on "Connecting public values with e-government" during the conference "2018 International Conference on E-Society Research" organised by the National Sun Yat-sen University (Taiwan).
- On 17 September 2018, Maxim Chantillon, Anthony Simonofski, Thomas Tombal, Rink Kruk and Joep Crompvoets presentated their poster "FLEXPUB - New Generation of Flexible Public Services (2016-2020)", during the conference "INSPIRE 2018" organised by the European Commission and the Flemish, Dutch and Belgian public administrations.
- On 25 September 2018, Maxim Chantillon gave a presentation on "Organisatiecultuur, publieke waarden en de toekomstige manier van werken", during the conference "Let's talk" organised by the FOD Mobiliteit & Vervoer.
- On 27 September 2018, Rink Kruk gave a presentation on "Geo-information: the Power of Innovation" at the Capgemini Week of Innovation Networks in Brussels.
- On 1 October 2018, Maxim Chantillon, Rink Kruk, Anthony Simonofski and Thomas Tombal organised and presented the FLEXPUB Workshop on the "Co-Creation of Guidelines for an Open and Agile Administration", at BELSPO.
- On 2 October 2018 Maxim Chantillon and Stijn Wouters gave a presentation on "E-Government: Public Administration and Public Sector" for KU Leuven Master Students.
- On 3 October 2018 Maxim Chantillon gave a presentation on "Agile Governments" for KU Leuven Master Students.
- On 3 October 2018, Thomas Tombal gave the "Setting the scene" presentation at the BITS (Brussels Internet & Telecom Seminars) seminar on "Data sharing and re-use", organised by the CRIDS and Cullen International.
- On 7 October 2018, Maxim Chantillon gave, together with prof. Crompvoets and Stijn Wouters, a presentation on "Authoritative Data in a European context : An exploratory study", during the conference "Eurogeographics General Assembly" organised by the Eurogeographics.
- On 19 October 2018 Maxim Chantillon presented his ongoing PhD Research at the International Hellenic University to the staff.
- On 20 October 2018, Anthony Simonofski presented his PhD Research at the Information Systems department of Linkoping.

- On the 7 and 8 November 2018, Rink Kruk demonstrated at the GIS4EU Conference in Brussels for the service developers and higher management level civil servants of the European Union, the importance and value of unambiguous and integrated geographic data for efficient and effective government. As use cases he presented the initiatives he pursues on behalf of the NGI to implement a Uniform Cartography 2.0 for the Emergency Services in Belgium.
- On 21 November 2018, Rink Kruk presented at the GIS4Defence Belgium day, about the developments for the emergency services towards a common, uniform cartography for them, together with the insights of the FLEXPUB-project.
- On 28 November 2018, Rink Kruk was invited to the Networking Evening of the Information Agency Flanders in Gent, where he discussed research questions and insights of the FLEXPUB-project with high-level representatives of administrations and institutions at local, provincial and regional level and of companies active in the (geo)data sector and e-Government.
- On 29 November 2018, Rink Kruk presented at the annual symposium of the Dutch National Centre for Geodesy and Geo-informatics at Wageningen University for an academic audience the "New Generation of flexible public services in Belgium – the geospatial case".
- On 4 December 2018, Thomas Tombal gave a presentation on "Questions liées aux droits des personnes concernées", during the conference "Le RGPD/GDPR après sa mise en application concrète: Questions choisies" organised by Larcier.
- On 11 December 2018, Maxim Chantillon gave a presentation on "Digitale transformatie & flexibiliteit: De rol van de publieke waarden", during the symposium "Digitale Transformatie" organised by the KU Leuven Public Governance Institute.
- On 19 and 20 December 2018, Rink Kruk presented on a higher management conference on National Security, Innovation and Disruptive Technology (Niveau-S) "Enabling Innovation with Geo-Services" organised by FPS Home Affairs and the VIAS Institute.
- On 17 January, February 4 and 18 February 2019, Rink Kruk organised three workshops with all emergency services from Belgium (virtually all firefighter zones, the local police, the federal police, defence, civil protection, nature and forest agencies, the provinces, the emergency centres, the national crisis centre, medical discipline, ASTRID, the Chancellery of the Prime Minister, foreign affairs, etc.) to come to a consensus and prioritisation on a uniform and shared cartography for the emergency services in Belgium, at the NGI.
- On 4 March 2019, Maxim Chantillon and Rink Kruk gave a presentation on the future of geo-information after the next federal, European and flemish elections, during the FLAGIS Study Day « Workshop Input Politiek Debat BeGeo ».
- On 5 March 2019, Thomas Tombal gave a presentation on "Favouring data access in B2b settings" at the conference "Designing Data Law", organised by the ULB and Bird & Bird.
- On 10 March 2019, Rink Kruk and Thomas Tombal organised a meeting about the implication of the new PSI Directive, Open data and the geo High Value Datasets for the NGI, which lead to the creation of the Working Group Open Data at the NGI, Brussels.
- On 19 March 2019, Maxim Chantillon and Thomas Tombal set the scene for the political debate on the importance of GeoData, held at the BeGeo 2019 conference, organised by the NGI and Agoria.

- On 28 March 2019, Anthony Simonofski and Thomas Tombal organised (with other members of the UNamur) the conference "Vivre la Ville : (dé)construire la Smart city".
- On 28 March 2019, Anthony Simonofski and Thomas Tombal organised (with Antoine Clarinval of the UNamur) the conference-show "Improvise ta Ville !".
- On 29 April 2019, Maxim Chantillon co-organised the visit of the Chief EU-Brexit Negotiated, Mr. Michel Barnier, at the KU Leuven, on the ongoing Brexit negotiations and the effects of the Brexit on the EU and Belgium.
- On 6 and 7 May 2019, Rink W. Kruk was panellist and gave a presentation on "Geodata as Instrument, Archival matter and Connector" at the "European eArchiving Geopreservation Conference" as part of the European Commission Connecting Europe Facility (CEF) eArchiving Building Block, in Ljubljana, Slovenia.
- On 10 May 2019, Thomas Tombal organised (with other members of the UNamur) the Conference "ACCA 2019".
- On 13 May 2019, Rink Kruk called together a meeting of high level representatives of the emergency services in Belgium to come to a consolidated and anchored approach for the use of uniform and shared cartography (location) in crisis, incidents and events, resulting in the launch of the National Stakeholder Committee for Location Data for Emergency Services, at the NGI, Brussels.
- On 15 May 2019, Maxim Chantillon gave a presentation on "The importance of Authoritative Data" during the EuroGeographics SuperKEN, organised in Leuven.
- On 23 May 2019, Thomas Tombal gave a presentation on "Quels droits sur les données?" during the conference "Actualités en droit du numérique", organised by the CRIDS, University Saint-Louis Brussels and Anthémis.
- On 23 May 2019, Anthony Simonofski and Thomas Tombal gave a three-hour module presentation on the topic "Smart Governance & Droit des TIC", as part of the continuous education program "Management des Smart Cities", organised by the Smart City Institute of the HEC Liège.
- On 30 May 2019, Anthony Simonofski presented the papers "Towards a Prioritization of e-Government Challenges: an Exploratory Study in Belgium" and "The Impact of Impediments on Open Government Data Use: Insights from Users" at the at the IEEE 13th International Conference on Research Challenges in Information Systems, IEEE, Brussels.
- On 11 June 2019, Rink Kruk gave, supported by Thomas Tombal and Maxim Chantillon, a presentation on "FLEXPUB: Developing a Strategy for Flexible and Innovative e-Services", at the "Data for Policy 2019 Conference" organised at the University College London.
- On 17-19 July 2019, Maxim Chantillon participated in the dialogue program of young political entrepreneurs "Urbanisation, Rural Development and Digitalisation - Political Implications of Transformation Processes" organised by the Hanns Seidel Stiftung in Münich (Germany).
- On 20 June 2019, Thomas Tombal gave a presentation on "Economic dependence and data access" at the "Third Workshop for Junior Researchers in IP law", organised by Sciences Po Law School, the Max Planck Institute for Innovation and Competition and the KU Leuven.

- On 14 August 2019, Anthony Simonofski presented the paper "Towards a Decision Support Guide for User Participation in Public e-Service Development" at the 25th Americas Conference on Information Systems in Cancun, Mexico.
- On 25 August 2019, Anthony Simonofski presented the paper "Engaging Children in the Smart City: A Participatory Design Workshop" at the 1st ACM SIGSOFT International Workshop on Education through Advanced Software Engineering and Artificial Intelligence (EASEAI '19) in Tallinn, Estonia.
- From 16 September 2019 until 25 October 2019 Maxim Chantillon participated in an atypical traineeship program offered by the European Commission DG DIGIT Interoperability Unit (1) to increase the knowledge on the possibilities of interoperability for the Belgian (federal) administration(s) and (2) to disseminate the FLEXPUB research results among the European Commission DG DIGIT civil servants.
- On 26 September 2019, Maxim Chantillon, Rink Kruk, Anthony Simonofski and Thomas Tombal organised the FLEXPUB workshop "Révision de la Directive PSI & Open Data: quel impact pour votre administration?" at the KU Leuven.
- On 26 September 2019, Thomas Tombal gave a presentation on "Update of the PSI Directive: What's new?" at the workshop "Révision de la Directive PSI & Open Data: quel impact pour votre administration?" organised by FLEXPUB.
- On 2 October 2019, Maxim Chantillon, co-organised the "European Commission DG DIGIT Interoperability Unit Second Workshop on Organisational Interoperability" at the European Commission Premises.
- On 8 October 2019, Maxim Chantillon participated in the debate "Een zicht op het openbaar domein" organised by FLAGIS at the Flemish Administration Premises in Brussels.
- On 8 October 2019, Maxim Chantillon gave a lecture on the "Meaning of E-Government" at KU Leuven.
- On 11 October 2019, Rink Kruk and Maxim Chantillon organised "Workshop III – Workshop Federal Innovation Network" for the Members of the Federal Innovation Network at the National Geographic Institute.
- On 17 October 2019, Thomas Tombal gave a presentation on "Droits sur les données et accès aux données: de quoi parle-t-on ?" during the "Séminaire Droit d'auteur : Développements récents dans les législations belges et européenne", organised by the FPS Economy.
- On 23 October 2019, Thomas Tombal gave a presentation on "Enjeux juridiques de la gouvernance de la donnée" at the conference "Smart Governance : Gouverner ses données pour mieux gouverner son territoire", organised par FuturoCité.
- On 19 November 2019, Thomas Tombal presented the background paper on "The EU Regulation of Data Sharing" (with Pr. Inge Graef of Tilburg University & Pr. Alexandre de Streel of UNamur) at the Digital Clearing House Roundtable.
- On 22 November 2019, Thomas Tombal gave a presentation on "The Fifty Shades of Data Sharing and the Law" (with Pr. Alexandre de Streel of UNamur) at the "Governing Data as a Resource" Workshop, organised by TILT and TILEC (Tilburg University).
- On 26 November 2019, prof. dr. ir. Joep Crompvoets and Maxim Chantillon organised, in collaboration with colleagues of the KU Leuven Public Governance Institute, the "Block Chain Symposium" in Leuven.

- On 27 November 2019, Maxim Chantillon gave a lecture on the "European Interoperability Framework" at KU Leuven.
- On 4 December 2019, Rink W. Kruk was panellist and gave a presentation on "Geodata as Instrument, Archival matter and Connector" at a workshop of the European Commission DG DIGIT and DG Connect for the European community Connecting Europe eArchiving building block addressing How to preserve, migrate, reuse and trust your data in Brussels. It was also broadcasted online.
- On 10 December 2019, Rink Kruk and Thomas Tombal organised a meeting of the Working Group Open Data of the NGI explaining the impact of the new PSI Directive and the high value geo datasets on the NGI, and the way how the Annex on High Value datasets will be negotiated and put in place, at the NGI, Brussels.
- On 11-13 December 2019, prof. dr. ir. Joep Crompvoets and Maxim Chantillon organised, in collaboration with the European Commission, the "Interoperability Academy Winter School 2019" in Leuven.
- On 9 January 2020, Anthony Simonofski presented the paper "The influence of public values on user participation in e-government: an exploratory study" at the Hawaiian Conference on System Science in Maui, Hawaii.
- On 22 January 2020, Thomas Tombal presented the paper "GDPR as shield to a data sharing remedy" at the CPDP 2020 Conference in Brussels.
- On 11 February 2020, Rink W. Kruk and Thomas Tombal organised a workshop for the Working Group for Open data at the NGI about the new version of the PSI Directive, High value geo data sets, in conjunction with the Chancellery of the Prime Minister, Agency for Administrative Simplification.
- On 5 March 2020, Thomas Tombal presented the paper "The Fifty Shades of Data Sharing and the Law" (written with Pr. Alexandre de Streel of UNamur) at the "MaCCI 2020 Annual Conference", organised by Leibniz Centre for European Economic Research (University of Mannheim).
- From 12 until 15 May 2020, the INSPIRE Conference 2020 was planned to take place. The team was selected to give a presentation on the final Strategy and final Blueprint, but due to the COVID-19 pandemic, the conference was redesigned to a virtual conference. For the virtual conference only the keynotes and the main presentations were kept.
- On 26 May 2020, Thomas Tombal gave a presentation on the topic "From 'rights in data' to 'data-related rights': the evolution of the European Data Strategy" at the ONLINE AIPPI Half Study Day.
- On 26 June 2020, Thomas Tombal presented the paper "GDPR as shield to a data sharing remedy" at the ASCOLA 2020 (Virtual) Conference.
- On 20 October 2020, the FLEXPUB team presented the results of the FLEXPUB research at the Geo-spatial awards.
- On 29 October 2020, Anthony Simonofski and Thomas Tombal gave a three-hour module presentation on the topic "Smart Governance & Droit des TIC", as part of the continuous education program "Management des Smart Cities", organised by the Smart City Institute of the HEC Liège.
- On 12 November 2020, Rink W. Kruk was panelist and gave a presentation at the "Data Ecosystems for Geospatial Data" workshop, as part of the European Location

Interoperability Solutions for e-Government (ELISE) programme, "Enabling Digital Government through Geospatial and Location Intelligence".

- On 18 November 2020, Thomas Tombal gave a presentation on the "Update of the PSI Directive: What's new?" at the "Open Data" workshop organised by FLAGIS in cooperation with FLEXPUB.

Furthermore, Rink Kruk continuously presents the research project at the meetings he attends in light of his work as project coordinator at the NGI. Examples are strategic meetings with the Crisis Centre of the FPS Interior Affairs, the projects with the federal & local police, networks of firefighters and the emergency centres, the federal heritage institutions Royal Library, State Archives and Royal Museum for Central Africa, evangelising, to ensure that the foundation 'location' and the pillars 'openness, participation and cooperation' continue to be established.

5.2.4. Material for Lectures Notes

The team members related to KU Leuven and/or UNamur have applied the findings from the research project in their lectures for students and other interested parties. As providing education is an ongoing activity, no specific overview has been provided for those materials.

5.2.5. Other Relevant Dissemination Activities

Digital Transformation Symposium (KU Leuven) – 2018

On 11 December 2018, the KU Leuven Public Governance Institute, and in particular prof. dr. ir. Joep Crompvoets, Maxim Chantillon and Stijn Wouters, organised a Digital Transformation Symposium at the Province House of Vlaams-Brabant (Leuven) for more than 110 civil servants and interested participants. This Symposium was organised in light of the FLEXPUB Research Project and the SBV Project on the Digital Flemish Administration. A full-day program was offered to the participants, with speakers from the European, national and Flemish administration. Also the private and academic sector gave presentations.

The program (in Dutch) can be found hereunder:

9:00 – 9:30	**Onthaal**
9:30 – 9:45	**Verwelkoming en opening studiedag** Dagvoorzitter prof. dr. Joep Crompvoets, Professor informatiemanagement in de publieke sector, KU Leuven Instituut voor de Overheid
9:45 – 10:15	**Current state of the art / development of Digital Transformation in the EU** Adrian Dusa, European Commission – Directorate-General for Informatics – Interoperability Unit
10:15 – 10:45	**Digitale Transformatie bij de Vlaamse Overheid** Mevr. Barbara Van Den Haute, Administrateur-generaal Informatie Vlaanderen
10:45 – 11:15	**Koffiepauze**
11:15 – 11:45	**Digitale Transformatie bij de Federale Overheid** Dhr. Ben Smeets, Directeur-generaal a.i. FOD Beleid en Ondersteuning – DG Digitale Transformatie
11:45 – 12:10	**Digitale transformatie en Gebruikersgerichtheid**

	Dhr. Stijn Wouters, KU Leuven Instituut voor de Overheid
12:10 – 12:30	**Digitale transformatie en Flexibiliteit** Dhr. Maxim Chantillon, KU Leuven Instituut voor de Overheid
12:30 – 13:30	**Lunch**
13:30 – 14:30	**Panelgesprek met vertegenwoordigers van sleutelorganisaties uit het middenveld, de publieke en private sector en de academische wereld** • Yves Schellekens – Business Group Leader Agoria • Björn De Vidts – Afdelingshoofd Agentschap Informatie Vlaanderen • Prof. dr. Steven Van De Walle – KU Leuven Instituut voor de Overheid
14:30 – 14:45	**Koffiepauze**
14:45 – 15:15	**The Digital Transformation in Estonia** Prof. dr. Veiko Lember, KU Leuven Instituut voor de Overheid – Tallinn University of Technology (Estonia)
15:15 – 15:45	**Digitale transformatie en managementhervormingen** Dr. Eva Platteau, KU Leuven Instituut voor de Overheid
15:45 – 16:15	**Digitale transformatie: Een blik op de politieke besluitvormingsproces** Dhr. Joseph Fattoucj, Adviseur Beleidscel Digitale Agenda – Telecom – Post Kabinet Minister De Croo
16:15 – 16:30	**Afsluitende reflecties** Prof. dr. Joep Crompvoets, KU Leuven Instituut voor de Overheid

Interoperability Academy Winter School 2019 (KU Leuven / European Commission) – 2019

The KU Leuven Public Governance Institute, and in particular prof. dr. ir. Joep Crompvoets, Maxim Chantillon and Lotte Laenen, organised, together with the European Commission's ISA² Programme, the first-ever Interoperability Academy Winter School which took place in Leuven on 11-13 December 2019. The Winter School provided participants with practical and theoretical insights on how to develop and implement interoperability solutions for digital public services offered to citizens, business and other public administrations. Moreover, the Winter School focused on public sector innovations and the future of digital transformation.

In total more than 150 students, professionals, academic and others across the European Union participated to the Winter School. Among the participants were also several stakeholders of the FLEXPUB Research Projects as well as members of the Follow-up Committee.

The programme was built around three topics, each day covering one of them:

- Day 1 - ISA² and European Interoperability Framework
- Day 2 - Public Sector Innovation
- Day 3 - Future of Digital Transformation

Day 1 offered the opportunity to learn about the European Interoperability Framework, the ongoing work on interoperability by the European Commission and other European Commission initiatives supporting digital transformation of public administrations. Strong emphasis was put

on the use of interoperability tools developed under the ISA² Programme. On Day 2 participants got familiar with the current public sector innovation activities at the European level. The presentations covered the planned activities that will support the adoption of emerging technologies in the public sector, in particular within the upcoming Digital Europe programme. Day 3 was dedicated to possible paths for the future of digital transformation in relation to governments. In the afternoon of Day 1 and Day 2, participants participated in interactive and practice-oriented workshops to share and stimulate their ideas and thoughts.

Every day a number of highly respected speakers from academia and the public sector shared their ideas and knowledge with the participants. Speakers will include among others Mrs. Natalia Aristimuño Pérez (Head of Interoperability Unit, European Commission), Prof. dr. ir. Marijn Janssen (TU Delft) and Prof. dr. Geert Bouckaert (KU Leuven).

A detailed overview of the program and the speakers can be found via this link. On this page, also the presentations of the various speakers can be found as well as video recordings of the key speakers.

6. ACKNOWLEDGEMENTS

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Also, and as disclaimer, we would like to underlined Membership of the Follow-up-Committee does not necessarily imply full endorsement of all content of the publications.

Please find hereunder an overview of the organisations that are Member of the Follow-up Committee.

Organisation
Federal Administration
ASTRID
Belgium postal service (BPOST)
Federale Politie / Police Fédérale
Federale Regering – Kabinet van de Minister van Defensie, belast met Ambtenarenzaken / Gouvernement Fédéral – Cabinet du Ministre de la Défense, en charge de la Fonction publique
FOD Beleid en Ondersteuning / SPF Stratégie et appui
FOD Binnenlandse Zaken / SPF Affaires Intérieurs
FOD Economie, K.M.O., Middenstand en Energie / SPF SPF Economie, P.M.E., Classes moyennes et Energie
FOD FEDICT
FOD Financiën / SPF Finances

FOD Mobiliteit en Vervoer / SPF Mobilité et Transports
Infrabel
Koninklijk Meteorologisch Instituut / Institut Royal de Météorologie
Koninklijke Sterrenwacht van België / Observatoire Royal de Belgique
Minister van Defensie / Ministère de la Défense
Nationaal Geografisch Instituut / Institut géographique national
POD Maatschappelijke Integratie / SPP Intégration Sociale
POD Wetenschapsbeleid / SPF Politique scientifique (BELSPO)
Rijksarchief / Archives du Royaume
Inter-federal Actors
Coördinatiestructuur voor Patrimoniuminformatie / Structure de Coordination de l'Information Patrimoniale
Regional Administrations
Agentschap Informatie Vlaanderen
Centrum voor Informatica van het Brussels Gewest / Centre d'Informatique pour la Région Bruxelloise (CRIB/CIRB)
e-Wallonie-Bruxelles Simplification
SPW - Département de la Géomatique
Local Administrations
iMIO
UCVW – Union des Villes et Communes de Wallonie
Vereniging van Vlaamse Steden en Gemeenten (VVSG)
VZW Smals
Other Actors
AGORIA ICT
GIM
Proximus
Open Geospatial Consortium

7. REFERENCES

The FLEXPUB research not only led to the production of the Strategy, the Blueprint, the Toolbox and the various Work Package reports, but also to several important scientific contributions, which are presented below.

7.1. Peer reviewed articles

7.1.1. Year I

As this was the first year of the project, the members of the team did not have the opportunity to publish scientific articles. The researchers only obtained preliminary results, based on the first findings.

7.1.2. Year II

Chantillon Maxim, Crompvoets Joep, Peristeras Vassilios (2017). The Governance Landscape of Geospatial E-Services—The Belgian Case. *ISPRS International Journal of Geo-information*, vol.6 (9), 1-25.

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7.2. Other publications

7.2.1. Year I

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