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Article

The Impact of User Participation Methods on E-Government Projects: The Case of La Louvière, Belgium

Anthony Simonofski [1,2,*], Benoît Vanderose [2], Antoine Clarinval [2] and Monique Snoeck [1]

[1] Leuven Institute for Research on Information Systems (LIRIS), Faculty of Economy and Business, KU Leuven, 3000 Leuven, Belgium; E-Mails: anthony.simonofski@kuleuven.be (A.S.), monique.snoeck@kuleuven.be (M.S.)
[2] Computer Science Faculty, University of Namur, 5000 Namur, Belgium, E-Mails: benoit.vanderose@unamur.be (B.V), antoine.clarinval@unamur.be (A.C.)

* Corresponding author

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Abstract
In recent years, information and communication technologies (ICT) have allowed governments to improve their internal functioning and to improve the delivery of information and services to their users. This application of ICT in governments has been conceptualized as "e-government". However, more recently, smart cities emerged as a locally-embedded paradigm that proposes the design of innovative solutions across all domains of our everyday life (mobility, environment, economy, education, quality of life, and governance) with ICT as an enabler. In their recent evolutions, these two concepts have advocated for increased involvement of their stakeholders (citizens, businesses, public servants, etc.) through user-participation methods to support the design of their projects. This article intends to examine how these methods impact an e-government project and, more particularly, to find out which challenges and benefits practitioners experience. In order to reach that goal, we studied the case of the city of La Louvière (Belgium) through a one year plus study following action research's best practices. This article contributes at several levels. First, it describes the challenges and benefits experienced with participation methods in a concrete project. Second, it proposes an e-government implementation process enhanced with these methods. Third, this article discusses the similarities and differences between e-government and smart cities through the lens of participation methods.

Keywords
action research; citizen; e-government; information and communication technologies; smart city; user participation

Issue
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1. Introduction

E-Government refers to the use of information and communication technologies to improve the delivery of information and services by governments to their stakeholders. However, in recent years, both research and practice have tried to identify what the "next stage" of e-government will be by focusing on all affected stakeholders as well as on the shift in governance which it enables. In this context, smart cities emerge as a more locally-embedded paradigm referring to the design of innovative solutions to tackle issues of public interest by including all the city's major stakeholders (government, the private sector, NGOs, citizens). As with e-government, this paradigm has evolved from a technology-centred perspective to a more stakeholder-oriented one.

As a result, both e-government and smart cities evolve and converge towards stakeholder-oriented concepts which give increased consideration of the need for participation from their stakeholders (citizens, busi-

nesses, public servants, etc.) through user participation methods in order to design their projects. In this article, we focus on the two particular stakeholder groups impacted by this shift: citizens and public servants, and we look into the potential for their participation in the context of e-government and smart cities. However, even though they realize some of the potential benefits of such participation, local communities still have to integrate the governance changes and related challenges that this participation requires. Therefore, the main goal of this article is to examine how their participation is enabled at all stages of a local e-government project. Furthermore, we also want to examine what the relationship is with the participation stimulated by the smart city research field. However, we do not limit the perspectives of participation to these two research fields but we also map it to the user participation perspective as found in information systems engineering. In order to reach that goal, we examined one particular city's engagement in participation methods through the lenses of e-government, smart city and user participation: the Belgian city of La Louvière. We had the opportunity to help them from the start to the development of their strategy and to monitor the implementation of participation methods. Through a one year plus study, we were able to conduct in-depth interviews with major practitioners in this city. They were either linked to the e-government or to the smart city strategy of La Louvière. We, therefore, examined how the e-government strategy was impacted by the participation methods and which challenges and benefits emerged from this strategy. Furthermore, we also had the opportunity to make recommendations about the participation methods applied following action research's methodological best practices.

The results presented in this article provide practitioners with concrete recommendations and guidelines to stimulate citizens and public servants to participate in an e-government context through appropriate methods. Furthermore, it proposes an e-government implementation process enhanced with these methods. In addition, this article also contributes to the conceptual discussion on e-government and smart cities through the lens of participation methods as well as the governance shift it has been inducing.

The article is structured as follows: in the "Background" section, we present the concepts of e-government, smart city, participation, and their interrelations. In the "Methodology" section, we formulate the research gap this article address and describe how the study of La Louvière was conducted following action research's best practices. In the "Results" section, we present the e-government strategy of La Louvière and the participation methods implemented based on our recommendations. In the "Discussion" section, we reflect on the research implications of how to bridge the gap between smart city and e-government research. Then, we give recommendations for practitioners involved in an e-government implementation process to help them develop their projects with the aid of participation methods. The "Conclusion" section summarizes the contributions and limitations of the article as well as leads for further research.

2. Background

This section positions the research problem within the existing literature regarding participation in e-government and smart cities. First, the e-government research and its evolution towards a stakeholder-centred concept is described. Second, smart cities are introduced as well as the specific Smart Governance sub-area that focuses on participation. Finally, the participation research field is described and is linked with e-government and smart cities. This last sub-section introduces the role of user participation methods, fueled by smart city and smart governance research, in an e-government project and presents research gaps this article intends to answer.

Figure 1 represents the presented research fields as well as their interconnections. The goal of this article (within the yellow frame) is to examine how a sub-field of participation research (user participation), fueled and stimulated by smart city and smart governance research, concretely impacts an e-government project.

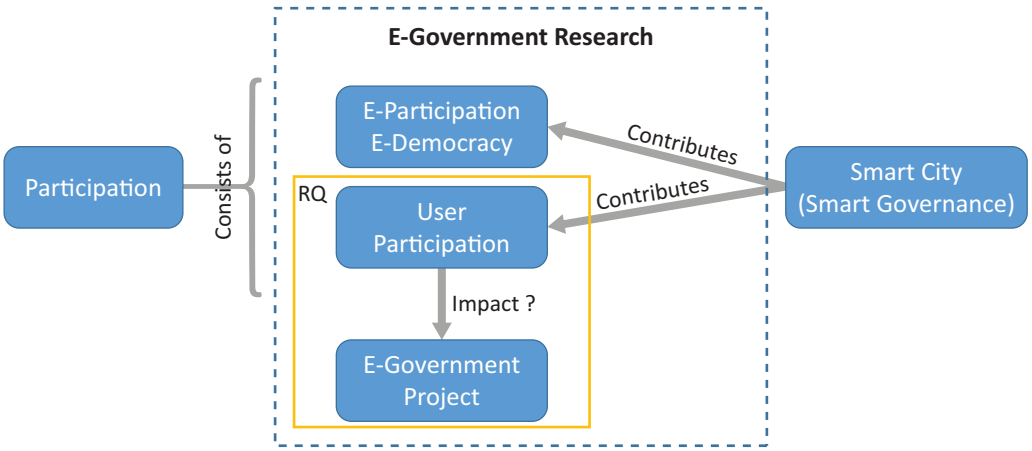

Figure 1. Background representation.

2.1. E-Government

E-government has become a general-purpose word for the use of information technology by a government. E-government is defined as the use of information and communication technologies (ICT) by governments to improve the delivery of information and services to citizens, business partners, employees and other government entities (Andersen & Henriksen, 2006; Layne & Lee, 2001). Sang, Xin and Silvana (2005) provide a classification of the e-government domain based on the target audience: G2C (citizens), G2B (businesses), G2G (government), IEE (internal efficiency and effectiveness) and overarching infrastructure (cross-cutting). In this article, we take a deeper look at the G2C sub-domain and the increasingly active role of citizens in it. There have been many attempts in the literature to design an evolutionary approach to e-government. The most influential was designed by Layne and Lee (2001), and distinguishes four stages:

1. cataloguing ("establishing government presence online and presenting information"),
2. transaction ("allowing citizens to transact with government electronically"),
3. vertical integration ("connecting government functions across different levels of government"),
4. horizontal integration ("connecting different government functions across the same level of government").

However, within the literature, discussion is ongoing regarding what the next stage of e-government will be. Verdegem and Verleye (2009) suggest developing an e-government strategy centred on user satisfaction and provide a list of indicators to evaluate it. Soon Ae, Shulman, Sandoval and Hovy (2010) propose integrating Web 2.0 principles into e-government and the provision of an evolutionary approach towards "e-government 2.0" to facilitate user participation by allowing them to interact and collaborate with each other in a social media dialogue as creators of user-generated content. Lee and Kwak (2012) suggest another maturity model for the e-government paradigm where there is an evolution towards open government with a focus on the citizen participation and the opening up of access to governmental data. In their attempt to propose a research agenda for smarter government, Scholl and Scholl (2014) introduce the smart government paradigm and underline the need for e-government to evolve and integrate the needs and requirements of a greater number of stakeholders, with a focus on citizens. All these visions of the "next step" of e-government converge towards user-centricity and argue for the participation of citizens.

2.2. Smart Cities

In the last few years, smart cities have become more popular than ever with the promise of new solutions in the domains of mobility, environment, economy, governance, quality of life, and education, thanks to the innovative use ICT (Caragliu, Del Bo, & Nijkamp, 2011). Generally, the interest in smart cities is strongly linked to the rise of new information technologies such as mobile devices, semantic web, cloud computing, and the Internet of Things (Schaffers et al., 2011). The term "smart city" was adopted in 2005 by a number of technology companies as they offered complex information systems to integrate the operations of an urban infrastructure (Harrison & Donnelly, 2011).

However, the literature shows that smart city projects pushed solely through technological solutions do not always meet the requirements and the actual needs of citizens (Hollands, 2008). The smart city concept aims to increase the quality of life of citizens, but cannot be limited to technology only, and must start from the human side of the equation (Nam & Pardo, 2011). Thus, a critique for this technological focus of smart cities led by authors such as Greenfield (2013) and Hollands (2008). Current literature underlines the importance of citizens in this transformation process for cities (Berntzen & Johannessen, 2016; Hollands, 2015). Hollands (2008) also claims that smart cities must be based on something more than the use of ICT if they want to enable social, environmental, economic, and cultural development. The real smart city, according to Hollands (2008), should start from the people and human capital of the city and use ICT to favour democratic debates about the kind of city people want to live in. As with e-government, the smart city also converges towards the stimulation of citizen participation. Among the different dimensions of the broad smart city concept, the smart governance dimension advocates for a shift in governance to allow stakeholders in governments to foster collaboration and participation (Rodríguez Bolívar & Meijer, 2016). In fact, it argues for an increased consideration of this by public servants and more industrial democracy. Furthermore, it also recommends a more important role for citizens in public life. Even though smart cities did not launch the discussion on citizen participation, they shed new light on this concept. Simonofski, Serral, De Smedt and Snoeck (2017) summarize the different enablers of citizen participation which can be implemented in a smart city context.

2.3. Participation Methods

The concept of participation has been theorized by Arnstein (1969), who suggests that participation is a spectrum consisting of three main tiers: non-participation, consultation (gathering of ideas but no impact on decision-making) and co-decision (sharing of the decision–making process between officials and citizens). From a previously performed systematic literature review on citizen participation in e-government, it is concluded that the proactive role of citizens can take two forms (Simonofski, Snoeck, Vanderose, Crompvoets, & Habra, 2017):

> First, citizens can be democratic participants who use the new technologies to impact the policy-making and decision-making processes of their governments. This participation has been conceptualized has e-participation or e-democracy by previous literature. (Macintosh, 2007)

Second, and form of participation which is the focus of this article, citizens can be considered as potential users of the e-government services whose requirements need to be assessed so that the services can be aligned with their actual needs. We label this participation as "user participation" in this article. Axelsson and Melin (2008) have analysed the importance of this role in previous research. At the centre of the convergence of the smart city and e-government concepts, several participation methods that concretely stimulate the gathering of users' input can be extracted. Simonofski, Snoeck et al. (2017) have identified eight main participation methods that can be used to include citizens in the development of smart city and e-government services:

- Interviews and group discussions
- Representation in project teams
- Workshops
- Surveys
- Dedicated software
- Social media
- Living labs
- Prototyping

Human–Computer Interaction (HCI) is heavily linked to this sub-area of participation as its core idea is to involve the end-user in the development of a system. Hence, HCI can help to gain insights into citizen participation in cases where the e-government project consists in developing a system in which citizens are end-users. In particular, user experience (UX) becomes critical in the development of e-government services as these often reflect complex procedures. Hartson and Pyla (2012) believe that developing systems guaranteeing a high-quality user experience is an iterative process composed of four steps. These steps are "Analysis", where data on end-users' needs and wishes are gathered and analyzed, "Design", where design alternatives for the to-be participatory system are built and reflected upon, "Prototype", where prototypes of the system are built with various fidelity levels, and "Evaluate", where the prototypes are evaluated by UX experts and/or end-users. These steps are iterative and can overlap (for instance, a quick prototype can be sketched to foster discussion in the "Design" step). Considering citizens as end-users, the participation methods listed by Simonofski, Snoeck et al. (2017) can be invoked in the four stages of the process in order to guarantee a high usability and in turn an efficient use of the system by citizens. For instance, interviews for the analysis, workshops for the design, living labs for the prototyping, and questionnaires with usability tests for the evaluation. In the next sections, we will refine and apply this methodology to a specific e-government project.

3. Methodology

3.1. Research Question

As seen in the literature analysis of the previous section, we have identified a research gap which this article intends to address. The relation between e-government and the smart city research fields remains blurred. However, as shown in the Background Section, both concepts seem to converge towards stakeholder-centricity by putting users at the centre of their strategy. Previous work such as Scholl and Scholl (2014) attempted to conceptualize this convergence with the idea of "smart government". However, there is no published research on the impact of participation methods, introduced or stimulated by the smart city and smart governance literature, on e-government. Furthermore, insight into the benefits and challenges of this implementation in concrete e-government project are still lacking. Thus, in order to fill that research gap, we propose the following research question: "What are the practical implications of user participation methods on an e-government project?"

3.2. Action Research Methodology

We have chosen to apply Action Research methodology, defined as "an approach in which the action researcher and a client collaborate in the diagnosis of the problem and in the development of a solution based on the diagnosis" (Bryman & Bell, 2007). We believe this approach is appropriate as it implies a close collaboration between the researchers and the members of the organization in which the research takes place. In this case, we applied this methodology to the case of La Louvière which wanted to engage in an e-government strategy and develop of an e-government portal to offer its services online.

For each of the four steps of the e-government strategy described in the next section, we applied the four stages of the action research spiral as described by Altrichter, Kemmis, McTaggart and Zuber-Skerritt (2002):

1. Plan: in this step, with the aid of best practices from the scientific literature, we were able to assist La Louvière officials in the design of a participatory e-government strategy;
2. Act: by means of on-field interaction, La Louvière officials implemented the actions and strategy discussed in the "Plan" step.
3. Observe: in this step, we were able to understand the impact of the actions that were taken upon the daily lives of the stakeholders as well as the impact on the portal that was to be developed;
4. Reflect: By means of in-depth interviews and focus groups, we were able to reflect on the process and to make improvements for the next iteration.

In order to plan and reflect on the e-government strategy, in addition to the close collaboration with the stakeholders during the one year plus study, semi-structured interviews were scheduled with relevant stakeholders throughout the process, as listed in Table 1. This qualitative method is effective when covering a complex topic in detail (Baarda, Goede, & Meer-Middelburg, 1996; Boyce & Neale, 2006). Moreover, this technique fits the research question well, as we intend to collect the experiences from the practitioners and not to validate their knowledge. Unfortunately, this method is prone to interviewee bias as individuals may give a distorted view of the subject. Triangulation is thus crucial for the validity of the research. Therefore, people from four different positions and perspective were interviewed to obtain the following perspectives: a strategic project management perspective, two operational perspectives (portal design and procedure rationalization) as well as a technical perspective. The interviews occurred in February, April, June, August, September, and November 2017, as well as February and March 2018. These semi-structured interviews were complemented by more informal discussions throughout the whole project as the different interviewees were continuously open for collaboration and feedback.

For each phase of the e-government process of La Louvière, we implemented the four main steps of action research (Plan, Act, Observe, Reflect) as summarized in Table 2. First, the global e-government strategy was formulated by the stakeholders. Second, the as-is processes of the administration were rationalized before engaging in any IT investments. Third, an online portal was developed to simplify the internal processes as well as the services offered to citizens. Finally, a feedback mechanism (in the form of an online survey on the portal) was added in order to gather input from the users. Improvements to the portal were made based on this feedback. This survey constitutes the only quantitative method to collect data from users in the overarching action research methodology due to the high number of citizens using the portal. A large-scale method was a more effective way to collect representative feedback.

4. Results: E-Government Strategy of La Louvière

The research was performed in the Belgian city of La Louvière (80,719 inhabitants) was particularly interesting as no e-government actions had been taken prior to our intervention. Thus, from the outset, we were able to analyze the different challenges and choices that the

Table 1. Interviewees.

ID	Function	Responsibility	Gender	Number of interviews
1	Head of Unit	Designing the e-government strategy	Man	8
2	e-Government Manager	Implementing the e-government strategy	Female	3
3	Document Management System Manager	Rationalizing the internal processes	Female	4
4	IT Responsible	IT Support of La Louvière	Man	2

Table 2. Action research: study summary.

	Plan	Act	Observe	Reflect
Strategy	Presentation of a theoretical framework and review strategy drafts by the researchers	Diffusion of the strategy internally	Interviews	Advice for the "Digital Strategic Plan" and continuous improvement of strategy
Processes	Recommendation of participation methods	Set up of a working group	Interviews	Benefits and inconveniences of the first participation activity
Portal	Agile practices and testing	Design of the portal	Interactive testing + interviews	Collaborative work analysis
Improvement	Introduction of feedback mechanism	Introduction of a satisfaction survey	Live testing + interviews	Analysis of insights from citizens and improvement

stakeholders had to make. Furthermore, La Louvière was also an interesting choice as there is an important digital divide amongst its citizens in terms of skills and access to IT tools. The term "digital divide" is used to refer to the differences in digital literacy and access to digital tools among citizens, but the digital inequality is not limited to its cognitive perspective. Indeed, La Louvière is a city of the Wallonia region where the access to IT resources and internet is low compared to EU average (Statbel, 2016). Furthermore, interviewees also stated that, according to their personal experience, the citizens of La Louvière suffer from a high digital divide as a consequence of the large proportion of unemployed people (21.85%) who rarely interact with e-government services.

This section is structured around the four main phases of the e-government project of La Louvière. For each of these phases, we detail how specific user participation methods were used to gather the input of citizens or public servants.

4.1. Formulating the Strategy

In this initial step of the e-government strategy of La Louvière, it was first necessary for the stakeholders to fully understand the ins and outs of e-government prior to starting any concrete action. Thus, we provided a course for the head of the unit about e-government in which the managerial and technological opportunities and challenges were discussed. More specifically, a specific e-government maturity model was presented. The head of unit reacted very positively to this structuring maturity model as it "allowed him to present his ideas and implement the e-government vision concretely". With the help of this structuring theory, it was also easier for the head of unit to present the draft strategy to the political representatives in order to secure the project's funding.

We were able to make recommendations about the strategy on three main axes. First, the necessity to work in an agile manner through the iterative execution the different phases of the project. Second, the need for increased consideration for citizens during the testing of the portal and its refinement. Finally, the need to make good use of a variety of communication channels (mail, social media, etc.) in order to inform the public of the new strategy.

It must also be stated that the strategy evolved throughout the project. At the latest stage of the study, the e-government strategy evolved towards a "Digital Strategic Plan". In this new plan, the head of unit organized the current and future actions of the city around several smart city dimensions. The e-government project could only be found in the "smart governance" dimension. however, the "smart people" dimension also introduced some elements applicable to e-government such as the nomination of "digital referents" within each department or the organization of workshops to train the staff.

4.2. Rationalizing the Processes

After the validation of the strategy by the political representatives, two new staff were hired to implement the strategy. First, an e-government manager was recruited to plan the development of the e-government portal in which citizens would be able to access the major part of the services provided by the municipal administration of La Louvière. Second, a Document Management System (DMS) manager was hired as the rationalization of the as-is processes constitutes an essential preliminary step to the e-government portal development. The DMS activity has a limited impact on the citizens but allows for self-evaluation of the internal processes and workflows by public servants. Thanks to this activity, the public servants benefited from common encoding metadata and facilitated the back-office adoption of the portal. The participation of public servants in the strategy was not limited to the DMS but shaped the whole e-government strategy. In order to increase the acceptance of the project and to gain input from public servants, the e-government manager organized a working group (method: interviews and group discussion) to explain the methodology applied in the strategy to one representative from each impacted department (Human Resources, IT, Records Management, Communication, Finance, Legal, etc.). The idea behind the working group was also to identify people who could prove to be valuable resources within each department. The e-government manager stated that "the overall reaction from public servants was positive since they had the opportunity to give ideas and feedback beforehand". However, the manager also noted that "the digital divide is present within the population but also internally between departments. Therefore, the explanations had to be adapted in function of the digital literacy of the department". The work performed by the DMS Manager also benefited from these participation methods. After she analyzed and modelled the existing process as is, she worked in pairs with the representatives from each department to validate the workflows.

4.3. Designing the Portal

While integrating the input internally and rationalizing the processes, the e-government manager also acquired an e-government software from an IT company specialized in that domain. Through a contact developer in that IT company, they were able to work in close collaboration with the manager giving direct feedback to customize the portal of the IT firm. It must also be noted that the IT company works with Open Source software that encourages continuous improvement and feedback from their users. However, the manager noted that the collaboration was sometimes hindered by the difficulty for the developer to fully understand the complex requirements of the manager.

After a first iteration, the manager submitted the portal to interactive testing internally to once again gain in-

put from the public servants. The organization of workshops with citizens was discussed but not conducted due to time and budget constraints.

The e-government manager also took into account feedback from various stakeholders as well as from the public servants. For instance, she collaborated closely with another city working on a similar portal project to exchange best practices and to understand the risks of failure. Furthermore, we intervened as researchers to test the portal through live testing (method: prototyping). We also conducted a heuristic evaluation following the method prescribed by Nielsen and Molich (1990). This evaluation was relevant at this stage of the project as it could be used to eliminate usability problems prior to live testing of the portal. Another advantage of heuristic evaluation is that it produces rich results with little effort and does not require extensive UX training. Later, a live testing session was organized at the municipal administration of La Louvière. We approached citizens who were coming to take care of administrative tasks and suggested that they try the portal instead of going through the traditional time-consuming process. As it is often the case with live testing activities, most citizens preferred not to use the portal. However, we gained valuable insights into the barriers citizens experience when facing such a portal. The most common barrier was that the portal did not support the specific administrative processes needed by the citizen. The other frequent hindrances were the lack of time (many citizens felt that they would not gain time by using the portal) and perceived complexity, reflecting the digital divide present among citizens. In addition, we think that a large majority of citizens consider administrative tasks as a chore. As a result, they come to the city administration willing to get it over with and are not inclined to try anything new. This would explain the unconvincing reasons for not using the portal that we received from some citizens, with one of them refusing to use the portal because she, in her own words, has "the brain of a goldfish". On a brighter note, the citizens who did use the portal were satisfied overall, despite the minor usability issues they encountered. One said that "it is quite nice of the city to make this available to the people of La Louvière".

Figure 2 presents a screenshot of the current version of the portal. This portal is an essential first step in their e-government strategy as it fits into the "Cataloguing" and "Transaction" stages described in Section 2.1. Some transactions available even offer "Vertical Integration" with the federal Belgian administration.

4.4. Improvement of the Portal and Strategy

Six months after its online launch, more than 6,400 demands were filed on the portal by the users. In order to evaluate the satisfaction and to collect the ideas of the citizens regarding the portal, we refined the evaluation survey suggested by Alawneh, Al-Refai and Batiha (2013). Their survey intended to evaluate the satisfaction of the users of e-government portals along several dimensions (method: survey). This questionnaire enables citizens to give their opinion in terms of:

- Accessibility: degree to which the interface of the portal is accessible for citizens with all levels of digital literacy;
- Communication on online procedures: degree to which citizens are aware of the existence of the portal and its benefits;

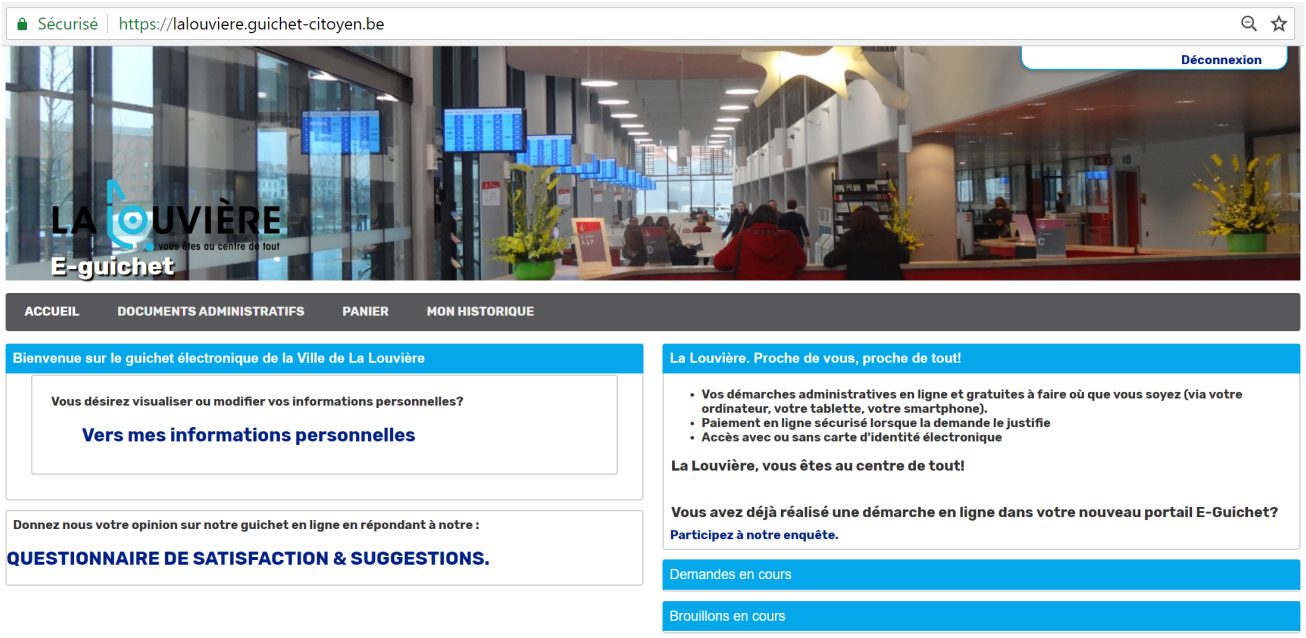

Figure 2. Portal screenshot.

- Quality of online administrative procedures: citizens' perception about the quality of services and products available on the portal;
- Future use: citizens' intention to re-use or recommend to the portal to others.

The questionnaire currently has more than 100 responses. The responses were collected thanks to convenience sampling based on people voluntarily wanting to answer the satisfaction survey on the portal. The link to the survey was set on the welcome screen (lower-left side of Figure 2) as well as after the citizens completed a procedure. On top of the evaluation dimensions, the survey also allows citizens to provide suggestions about the future documents and procedures to put online as well as ways to improve the e-government strategy. Therefore, it is a direct way for citizens to participate in the improvement of the e-government strategy of a Louvière. The e-government manager of La Louvière monitors the suggestions and feedback from citizens, answering them as promptly as possible.

The e-government manager has also decided to install a terminal on the ground floor of the administration. With the terminal, citizens are able to access the e-government portal with the assistance of employees to explain its functioning. This allows people to access the multi-channel strategy of La Louvière, thus tackling the significant digital divide within the city. However, discussions are currently underway regarding the future of the terminal, as it will require additional investment to maintain a welcoming public agent to work alongside it.

5. Discussion: Participatory E-Government Implementation Process

As previously discussed, smart cities refer to the use of ICT to improve the quality of life of the impacted stakeholders through a smart (or participatory) governance. Therefore, e-government can be considered as a subdomain of smart cities as, in this specific case, ICT is used to improve the functioning of government. In this article, we focused on the relevance of user participation in this improvement through the introduction of three participation methods. However, this article has also inherent limitations. First, we were only able to analyze the impact of three participation methods on the project but other methods should be examined in the future. The stakeholders we interviewed were limited to four (though we interviewed them multiple times). More information about the challenges and the perceptions of the project could have been elicited with a greater number of interviewees. Furthermore, the findings only reflect the situation of one city in Belgium and should be cross-validated with studies in other cities (of different scales, e-government maturity, population distributions, etc.) in Belgium or internationally to determine the extent to which our findings can be generalized. Another neglected aspect of this study is the physical accessibility of the portal. The digital divide is a recurrent term in discussions about smart cities. There are cases where citizens cannot interact with technology because it is physically impossible for them (for instance, they suffer from a heavy disability, or they do not have access to the required hardware). A solution labelled as smart such as the portal developed in La Louvière should tackle digital divide from both perspectives.

In order to demonstrate the relevance of participation methods in an e-government project, we propose an implementation process describing the different phases of an e-government project and where the three participation methods applied in La Louvière added value in the process. Figure 3 details this implementation process by abstracting the four main phases described in the Results Section.

Through the studied case, three different participation methods were used to introduce governance shifts in the e-government strategy of La Louvière: Interviews and Group Discussions, Prototyping, and Online Surveys. However, many more methods exist (including ones researched in the smart city literature) which could be

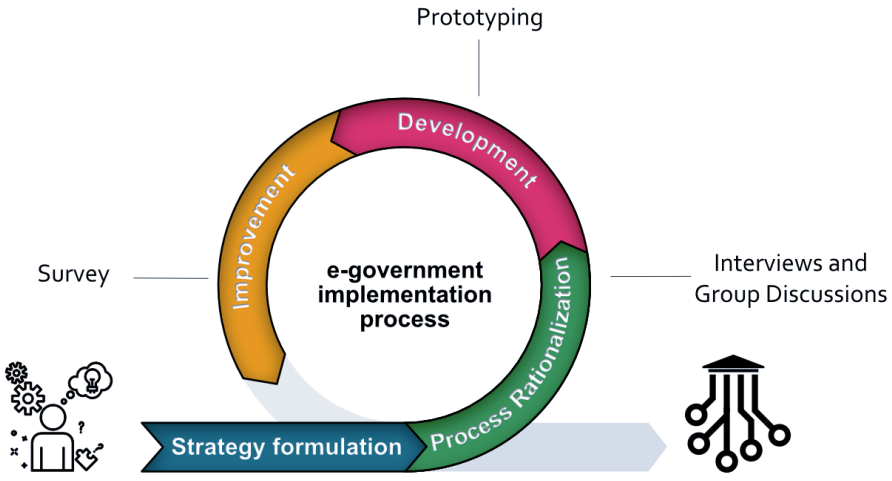

Figure 3. E-government implementation process.

applied in this context. Table 3 suggests a participation method matrix where we formulate a hypothesis about the potential relevance of participation methods in each of the four steps of the implementation process. The green cells refer to the methods tested in La Louvière. In blue, we make a positive recommendation since our experience with the studied case and related research suggest that the method could have benefits for the suggested step. In orange, we make a negative recommendation since the methods may not be appropriate to the respective phase.

All of the cells in Table 1 are leads for further research. The positive and negative recommendations should be tested in concrete settings. Due to space limitations, we only detail here four hypotheses that are particularly promising:

- H1: Workshops to "Formulate the Strategy"

In the context of the studied case, no participation methods were applied to formulate the strategy as this was performed by the head of unit of the city in collaboration with the researchers. However, insights to gain ideas from citizens and public servants could have been collected by organizing workshops. Indeed, the organization of workshops to interact with a selected group of representative stakeholders has already been applied in e-government service development (Oostveen & Van Den Besselaar, 2004). The insights gained from workshops can also be helpful in more strategy-related phases before developing the e-government service. Furthermore, as citizens or public servants may be reluctant to speak openly about their ideas and feedback, facilitation techniques should be used. For instance, creativity techniques such as visualization tools or improvisation principles have already been applied (Mahaux & Maiden, 2008).

- H2: Representation in Project team to "Rationalize the Processes"

In La Louvière, the e-government manager and the DMS manager conducted interviews and group discussions to understand the current processes and how they could improve them. However, the participation method was only applied to gain insight from public servants and not of the citizen's perspective. Furthermore, their impact was limited as they only gave information without contributing any ideas as how best to improve the current situation. In order to give greater influence to users (including citizens), the managers could have included interested public servants or citizens in the project team (or in a steering committee) to gather direct feedback on the rationalization. This has already been underlined in literature as Chan and Pan (2008) advocate the identification of salient intermediaries in all phases of an e-government project.

- H3: Living Lab to "Design the Portal"

During the development of the portal, the IT manager and the e-government manager used the prototyping technique to get insights from potential users to assess the usability of the portal during its development. We argue that input can and should be gathered in other phases of the software development process (requirements elicitation or implementation). One possible method that allows this end-to-end participation resides

Table 3. Participation methods matrix.

	Strategy Formulation	Process Rationalization	Development	Improvement
Interview and Group Discussions	Positive	Tested In La Louvière	Positive	Lack of representativeness
Workshops	Positive (H1)	Positive	Positive	Lack of representativeness
Representation in Project Team	Positive	Positive (H2)	Positive	Lack of representativeness
Dedicated Software	Important investment at this stage	Not applicable	Positive	Positive
Living Lab	Important investment at this stage	Not applicable	Positive (H3)	Positive
Prototyping	Not applicable	Not applicable	Tested In La Louvière	Not applicable
Social Media	Too many stakeholders involved	Not applicable	Positive	Positive (H4)
Survey	Too many stakeholders involved	Too many stakeholders involved	Positive	Tested In La Louvière

in the Living Labs, defined as "user-driven open innovation ecosystem based on a business-citizens-government partnership which enables users to take an active part in the research, development and innovation process" (European Commission, 2009). This method, often implemented in smart cities, can be applied to explore the needs and ideas of citizens regarding e-government projects (Cossetta & Palumbo, 2014). Furthermore, additional activities could be organized within this living lab such as Hackatons to provide citizens with the opportunity to actively participate in the implementation of the solution.

- H4: Social Media to "Improve the Portal and Strategy":

In order to get continuous feedback and ideas about their portal, La Louvière set up an online survey on the portal. However, this will only gain feedback from the people using the platform. Even though this survey gathers relevant feedback, more extensive inputs could be raised by using social media channels. Indeed, the use of Social Media in an e-government context often refers to the political participation of citizens but it can also be used in software development (Storey, Treude, & Van Deursen, 2010). Some authors including Bonsón, Torres, Royo and Flores (2012) have already studied the use of social media in an e-government setting.

6. Conclusions

User participation is an opportunity for governments to benefit from relevant information to design and improve their projects. The number of participation methods keeps increasing and is increasingly under discussion in various research fields (e-government, smart city, open government, information systems, human–computer interaction, etc.). However, there is little information about the impact of these methods on concrete projects.

This article contributes at several levels. First, we examined the case of La Louvière and were able to analyze empirically the impact of three participation methods in the processes of the city. Second, we were able to abstract in an implementation process four different steps that could be applied in other cities. Furthermore, we also suggested a participation method matrix for a participatory e-government project building on upon the aforementioned four phases and participation methods. Finally, this article also discussed the similarities and differences, as experienced by practitioners, between the converging concepts of e-government and smart cities.

This article provides leads for further research. The participation methods presented in the matrix that were not tested in this study should be implemented in concrete cases as recommended in the Discussion Section. Also, further research should be conducted to investigate whether the participation methods indeed led to an increased used of the portal in La Louvière. The impact of participation should also receive additional attention. Indeed, all activities performed in this study were limited to consultation purposes with no guarantee of impact on decision-making. An analysis of the extent to which the citizens have had an impact on the decisions of the e-government projects would be particularly valuable.

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Conflict of Interests

The authors declare no conflict of interests.

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About the Authors

Anthony Simonofski is PhD Student and Researcher at the Computer Science Faculty of the University of Namur (UNamur) and at the Faculty of Economics and Business of the KU Leuven. As a result of his background in Business Engineering, his research focuses on the implication of ICT in public organizations through several lenses, including: citizen participation, smart cities, e-government, and agile methodologies.

Benoît Vanderose is Assistant Professor of Software Engineering at the Computer Science Faculty of the University of Namur (UNamur). He received his PhD in Computer Science from UNamur in 2012. Benoît has a strong track record of research in software quality, agile methodologies tailoring, administrative simplification, and e-government. His research has resulted in a model-driven and iterative software quality assessment methodology.

Antoine Clarinval received the MS degree in computer science from the University of Namur in 2017. He is currently working toward the PhD degree in computer science at the University of Namur. His research interests include information visualization, human-computer interaction, and ambient interfaces for citizen participation.

Monique Snoeck is Full Professor of Management Information Systems at the Faculty of Economics and Business of the KU Leuven and visiting professor at the University of Namur (UNamur). She received her PhD in Computer Science from KU Leuven in 1995. Monique has a strong track record of research in requirements engineering, conceptual modelling, business process modelling, model quality, model-driven engineering, and e-learning. Her research has resulted in the Enterprise Information Systems Engineering approach MERODE and its companion e-learning and prototyping tool JMermaid.