

## SMART GOVERNMENT: AN EUROPEAN APPROACH TOWARD BUILDING SUSTAINABLE AND SECURE CITIES OF TOMORROW

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### ABSTRACT

The term Smart Government often appears in correlation with the Smart City subject and is seen as one of its elements. In fact, while those two terms share common interests and focus on similar technological solutions, they are still separate subjects that can, but do not have to, result from each other. A Smart Government might be a part of a Smart City's agenda, but for municipalities with an already well-modernized governing system, it is not a necessary premise. In such cases, a Smart Governance, which is one of a Smart City's dimensions, might be considered in regard to upgrading some of the existing governing tools without tackling the matter of redefining administrative structures. Those subtle differences fuse together because the debate on digital transformation concerns numerous varying urbanization aspects that often show only the big picture of possibilities and, subsequently, are not specific enough to provide the cities with useful directions and priorities in the real agenda setting. In this context, the effort linked to restructuring even a small administrative faction in terms of Smart Government can be seen by the public and municipalities as simply overwhelming. Therefore, focusing on this subject exclusively and defining the current, city-specific demand on the Information and Communication Technologies (ICT) -driven administrative system seems to be crucial in developing real working solutions in this field. The first part of this paper clarifies the definition of Smart Government by showing its specifics and fundamental rules from the European perspective. It also focuses on different structural implementation tools and presents a new approach toward Policy Cycle. The second part concentrates on crucial ICT components of a Smart Government. The last part lists some possible challenges that might occur throughout the implementation process. The paper ends with a summary presented in the form of a charter that exhibits the key points and priorities needed to establish an effective and sustainable Smart Government agenda.

*Keywords:* Big Data; Cloud Platforms; ICT; Policy Cycle; Smart City; Smart Government

### 1. INTRODUCTION

Digitalization has lately become an omnipresent topic in most international discussions regarding future city planning. For many, Smart Cities are the equivalent of a new, sustainable approach toward urbanization because, through technological improvement, they offer more transparent and egalitarian management tools. Not only municipalities but other city stakeholders have started to be increasingly interested in co-working on nearly every urban redevelopment aspect. According to Al-Khouri (2015), "the internet and subsequent

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technological developments have pushed citizens' expectations to new levels. (...) Governments worldwide are struggling to comprehend the rapid developments that have impacted all practice fields around them."

This raises a question of how such a complex transformation like redefining governmental structures and adjusting them to ever-changing IT solutions should be approached. "The likelihood of substantial changes is high since digitalization is not only a technology in the narrowest sense but a new form of communication that permeates all social and economic processes and inevitably gives rise to new knowledge holders and stakeholders" (Bundesinstitut für Bau-, Stadt- und Raumforschung (German Federal Institute for Research on Building, Urban Affairs and Spatial Development; BBSR, 2017).

For many municipalities, the topic seems to be overwhelming and simply not realistic in a short time, as adjustment procedures for legal reinforcements and structural governmental changes are highly complex, long-term processes. However, with a certain pragmatic approach and set of key priorities on which cities could focus in a new agenda setting, a consequent and progressive change can be achieved.

## 2. SMART GOVERNMENT

### 2.1. What Defines a Smart Government?

Although the general understanding of governmental processes and structures varies between most countries, there are some common premises describing the general direction in which Smart Government goes.

One of them is **connectivity**. Based on Häfler's definition, "an intelligently connected governmental and administrative sphere of actions uses the opportunity to join objects and cyber-secure systems to execute public tasks in a more efficient and effective way" (von Lucke, 2015). Through benefiting from technological development, a new form of **communication and cooperation between government and civic society** can be established. Through an external expertise provided by a well-connected and knowledge-driven society, a Smart Government is given a chance to respond quickly to the changes and new demands it is exposed to.

What differentiates innovative governing methods from present approaches is a real-time, evidence-based, iterated information flow built on multi-source data exchange. Here, the prioritization of the creation of a communication platform and setting the necessary policies and procedures **within governmental structures first** are essential, as most municipalities lack efficient information flow between their units, making further external communication problematic. As basic, required legal forms are established, such a platform needs to be expanded to external stakeholders to be an actual ICT tool in Smart Government.

In terms of connectivity, to ascertain external communication in a broader matter, the sensor-based connections of IoT can be merged with intelligently analyzed and applied information from mass data and transferred on (preferably) open, web-based platforms or their open governmental extensions. This enables a simple, visualized form of interaction between stakeholders who provide their data, that is, those who actively participate in the cooperation process. As access to the Internet and the usage of the mobile devices connected to it grows, accessibility stops being a constraint. Therefore, concepts like E-Governance and Open-Government become broadly used, as they present many complex operations in a more transparent and citizen-friendly way (Willke, 2007). The topic of open platforms is briefly described in chapter 2.3.

## 2.2. Political Aspect of Setting a Smart Government Agenda

The complexity of Smart Government especially concerns democratic countries where political cycles change in relatively short time periods. Therefore, without a certain, autonomous policy setting or without independent administrative structures free from political influence, the transformation process is seen by many as a barely achievable goal. Although Smart Government aims for rather decentralized and more democratic processes, the demand for redefining cooperation methods between politics and civic society remains a crucial point, as many important decisions will still remain in governmental hands. In countries with a federal political system, where different administrative units (national, state, local) can be governed by parties with opposing political programs, this becomes a great challenge. Mostly, formulated policies are based on “(...) political commitments made at election time, the priorities of individual elected officials (ministers, mayors, etc.), obligations from (...) directives and international treaties, public pressure (...)” (European Commission, 2017) and are, therefore, hard to reframe and reimplement. Here, clear definitions of pan-political cooperation rules, redefinable political subjects, and spheres of influence are required to achieve and sustain long-term co-working schemes. The following subchapters (2.2.1–2.2.3) first introduce an anchor to policy setting and data-driven economy and, second, the concept of Policy Cycle to show how such an ICT and data-driven approach can be beneficial in formulating policies and in their iterative evaluation. Lastly, some chosen structural implementation tools and resources required in building a Smart Government based on European Committee best practices will be presented.

### 2.2.1. Policy setting and data-driven economy

As the general awareness of data value and its wide usage spectrum increases, many governmental units and their political representatives look for compromises between shifting the economic development toward digitalization and ensuring the protection of valuable personal information from unfavorable misuse. For them, such an approach is important for future policy setting, as “the value of the EU data economy was more than EUR 285 billion in 2015, representing over 1.94% of the EU GDP. Due to a year-on-year growth rate of 5.03%, this value increased to EUR 300 billion representing 1.99% of the GDP in 2016. If favourable policy and legislative conditions are put in place in time and investments in ICT are encouraged, the value of the European data economy may increase to EUR 739 billion by 2020, representing 4% of the overall EU GDP” (European Commission, 2018).

A free flow of non-personal data derived, for example, from sensors, is a first step toward building such an economy, which is not only beneficial from the financial perspective but is also crucial for the analysis required in diverse strategical urban development plans as well as policy design. Therefore, on June 19th, 2018, the European Commission, together with European Parliament and Council, released “(...) a provisional political agreement on the Regulation on [such] data” (European Commission, 2018). Together with the already reached General Data Protection Regulation (GDPR), it will enable an obstacle-free flow of all data within the European Union, ensuring personal data protection and eliminating potential misappropriations. The newest regulation also guarantees the availability of data for regulatory control: public authorities will retain access to data, even when it is located in another Member State or when it is stored or processed in the cloud (European Commission, 2018).

A sustained and knowledgeable use of public or public-funded data has a high potential for assisting policy formulation and especially for its further iterative evaluation.

### 2.2.2. Policy cycle and ICT-driven collaborative democracy

As mentioned in chapter 2.2, the importance of politics and its challenging complexity of policy formulation are visible in many governmental processes and at different administrative levels. Nevertheless, the digital transformation offers an opportunity to positively influence and redefine it. In last few years, the debate has been emphasizing the importance of so-called

deliberative democracy, where opinions, expertise, and engagement of third parties like citizens, universities, or companies would have a more real impact on political decisions. This would not be limited to higher participation in selected processes but would also build the first milestone of collaborative democracy, where the responsibilities of the decision-making and execution of political strategies lie with every stakeholder. New Public Management debates, especially widely spread in Switzerland, show that through broader cooperation between diverse city actors and, therefore, greater transparency in transformational processes, both public and governmental factions will impose a demand for higher efficiency, rationality, and effectiveness more often (Hölterhoff et al., 2016). As the responsibility will become shared to the extent of the stakeholder-specific sphere of influence, the possibility of a bigger amount of emerging sustainable transformation concepts will consequently increase as well. This will also give citizens a better understanding of the complexity of the decisions made at the governmental level and might, in some cases, enhance the acceptance of chosen solutions.

A report on Smart Government created in 2016 by a Swiss economic research company Prognos AG ("Trendreport Effizienter Staat", www.prognos.com), shows how, until 2030 in Germany, the widely known 5 Stages of Policy Cycle will change through technological development. Intelligently evaluated and used information, gathered from Big Data and transferred onto, for example, open cloud-based platforms, will found the basis of new agendas toward policy formulation and its implementation and iterative evaluation. As this process becomes open to third parties, political factions will see more value and necessity in referring to external expertise. Not only will transparency and higher participation be achieved through this measurement, but the policy formulation itself will become quicker, giving more room to a greater amount of solutions. This would reflect the needs of society, remaining pragmatic through its governmental context. The same can apply to its management instruments, which can potentially become more agile and flexible toward ongoing changes without their current high costs and time consumption. As the new incremental working methods like SCRUM gain popularity, especially in bigger, top-down-hierarchy companies from the private sector, it appears possible that, through a similar restructuring of working schemes in administrative units, the cooperation between government and third parties using common schemes will gain velocity and intuitiveness, benefiting all the involved parties (Hölterhoff et al., 2016).

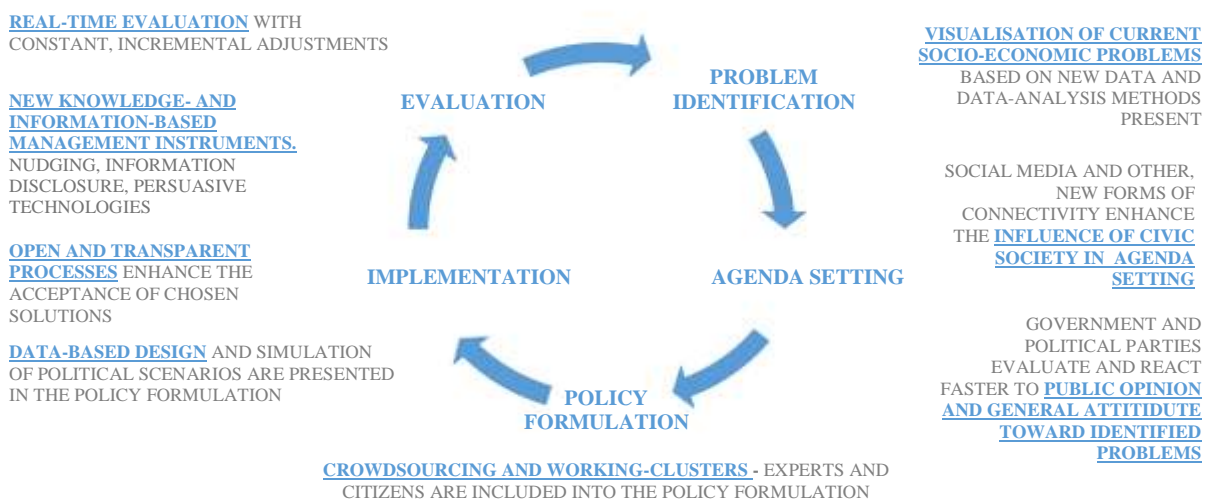


Figure 1 Redefinition of 5 stages of policy cycle graphic. Based on smart government - regieren und verwalten in Deutschland im Jahr 2030 (Smart Government - Governing and administrating in Germany in 2030), Jan Tiessen, Prognos AG, 2016

### 2.2.3. Structural implementation tools and resources required in building a Smart Government

It is important to mention that, for some governmental units, promoting public or public-funded data in policy design is often perceived as an obstruction rather than as an opportunity:

*“There is a growing risk that the increasing ability of people to formulate their collective demands via ICT and the inadequacy of political institutions to address them can lead to systemic crises in states. To a certain extent, current developments imply a reversal of the traditional roles of state and society. What used to be a strictly top-down implementation of policy decisions, from the state down to society, is increasingly developing into a relationship in which governments have to use their capabilities and administrative power to react to organized elements of civil society”* (Höchtel et al., 2015).

Also problematic is the definition of usable implementation tools and resources, as well as their distribution among different administration levels (national, state, local), as any new policy formulation requires a vast amount of changes to be implemented by experienced staff on each of the levels. Although there is no universal approach toward building a Smart Government, there are some mutual priorities within digitalization-oriented European countries that might be useful for setting Smart Government agendas.

- Political factions and governing units may find their work more effective when they refer to the already existing strategic frames (for example, strategic plan, master plan, integrated urban development concept (Integriertes Stadtentwicklungskonzept; ISEK, political program, etc.) in agenda setting and developing them into a concrete proposal suitable for presenting in public debates and consultations. Such frames should already consider relations and the distribution of resources between existing administration levels to some extent, as many governmental tasks can be fulfilled only in a specific field of influence. It is important here to create an outline idea that would gradually become more detailed on a regional and local level.
- Municipalities might find helpful to concentrate on evaluating schemes for debates and consultations, as well as schemes for policy/plan, etc., formulations and implementations – previously described as Policy Cycle – that would show their policy design approaches in a simplified but transparent form understandable to third parties.
- Governments should focus on creating an internal communication platform within their structures – preferably web-based, in cloud computing technology.
- For many municipalities establishing the external open platform providing digital service infrastructure is crucial to enable non-governmental stakeholders to participate in undertaken processes. Here, a clear definition of relations between all the contributing actors, as well as a clear sphere of legally framed influences among the administration level, is crucial to distributing and supervising the commenced actions.
- Governing units should provide an access to re-usable public-sector information like, for example, European Public Open Data (European Commission, 2017).
- Government needs to focus on setting regulations on non-personal and personal data enabling data flow within a specified sphere or during a concrete process, both within and outside of administrative structures.

Municipalities should involve in the agenda setting diverse experts' bodies from sectors of the greatest interest. In Europe, for example, the “Public Sector Information (LAPSI) - thematic network of lawyers specialising on PSI re-use, including academics and practitioners” exists (European Commission, 2017). Citizen initiatives, NGO, local and regional start-up scenes, etc., are important city stakeholders, which, under governmental supervision, can create well-functioning and vision-driven expert clusters that could support various governmental tasks.

Empowering such clusters is also fundamental for a collaborative approach toward building a Smart Government.

### 2.3. Cloud Technology for Smart Government

One notable benefit of digitalization is the possibility of communicating and interacting without any distance or time limits. As today's economy is driven by a demand to achieve better quality in a faster and more efficient way, a need for effective and simplistic IT solutions has become a priority. Through the vastly expanding use of the Internet, which supports the economical digitalization switch, the subject of cloud computing and cloud-based platforms became present in public debate. Over time, many technology companies started to work on such agile systems that provided an "(...) environment with everything required to support the complete lifecycle of building and delivering web-based (cloud) applications—without the cost and complexity of buying and managing the underlying hardware, software, provisioning, and hosting" (IBM cloud, 2018). In 2014, a renowned software corporation Systems Applications and Products in Data Processing (SAP) introduced their first version of a Networked Logistics Hub 1.0 (NLH 1.0), an application that monitors logistic traffic and communicates it between trucks and other business partners involved in the delivery process. This particular solution won international attention thanks to its very intuitively built cloud platform, which allows real-time truck tracking and provides the needed communication, making logistic planning and its execution more efficient and less resource-consuming. It also showed the wide range of opportunities that such a simple solution provides when tasks become more transparent, well divided and communicated between each party (SAP NLH 1.0, 2018).

For many, it started a discussion on amplifying similar concepts into more complex, urban environments. Thanks to the intuitive, re-scalable, and demand-adaptable structures of such cloud systems, many cities have started to consider investing in solutions that could serve their demand for more intelligent, information-driven city management. Since many municipal units have already been collecting diverse data but could not or did not want to share them with third parties or even within their own internal structures, a big wave of public criticism forced cities to rethink their approaches. In Germany, many towns started putting so-called Open Urban Service and Information Platforms on their agendas, which use sorted-out Big Data to provide urban services like real-time traffic analysis or convenient mobility offers and share them with citizens (Morgenstadt Solutions, 2015).

#### 2.3.1. Cooperation platforms as a future management tool for smart governments

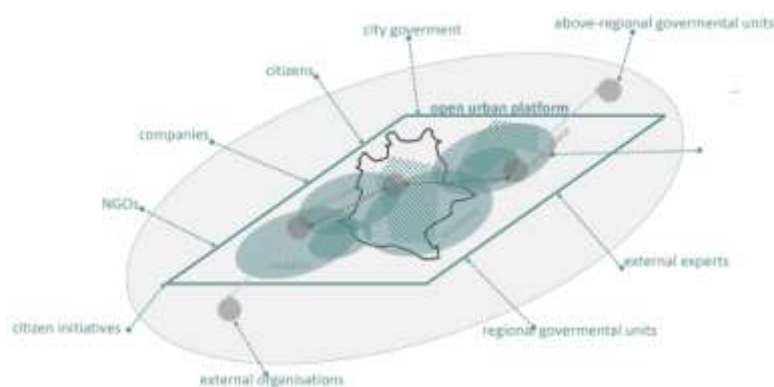


Figure 2 Cooperation platform of ModelCity+ (Own graphic. All rights reserved)

Despite all the positive aspects of Open Urban Service and Information Platforms, such tools are still only the first step toward building sustainable Smart Government tools, as providing digital services is simply not enough in the context of the city governing. Therefore, knowing

the benefits of cloud computing, the trend goes toward so-called cooperation platforms, which are more process-oriented and put less emphasis on services in their first stages. Their main goal is to reinforce the cooperation between the administrative system and civil society, where decision-making, execution, and evaluation stand as the central points. Cloud technology allows digitalizing the Policy Cycle through concentrating selected governmental processes in the background and exposing the most essential operational stages needed in public policy formulation. So-called coproduction requires allowing necessary data to be opened and shared in order to include third parties in the expertise exchange, disrupting today’s administrative structures.

Further, Smart Government may allow the joining of governmental procedures with services provided by the private sector, ultimately leading to relieving some of the administrative processes without manipulative competition on the market (Hölterhoff et al., 2016). In this case, collaborative platforms can be either extended or joined with Open Urban Service and Information Platforms, creating multi-tasking and highly data-driven open urban platforms.

The graphic below schematically shows how a single process can work on such an open urban platform. It includes operations, budget, process participants, and lifetime. It also provides an option to add any other feature essential for achieving a certain goal. As the platform is shared, everyone who gains a specific stakeholder status can join the operation or vote for proposed solutions. Participation is also open to troubleshooting or suggesting additional goals/tasks which appear necessary for the progression of the process over time (ModelCity+, 2018).

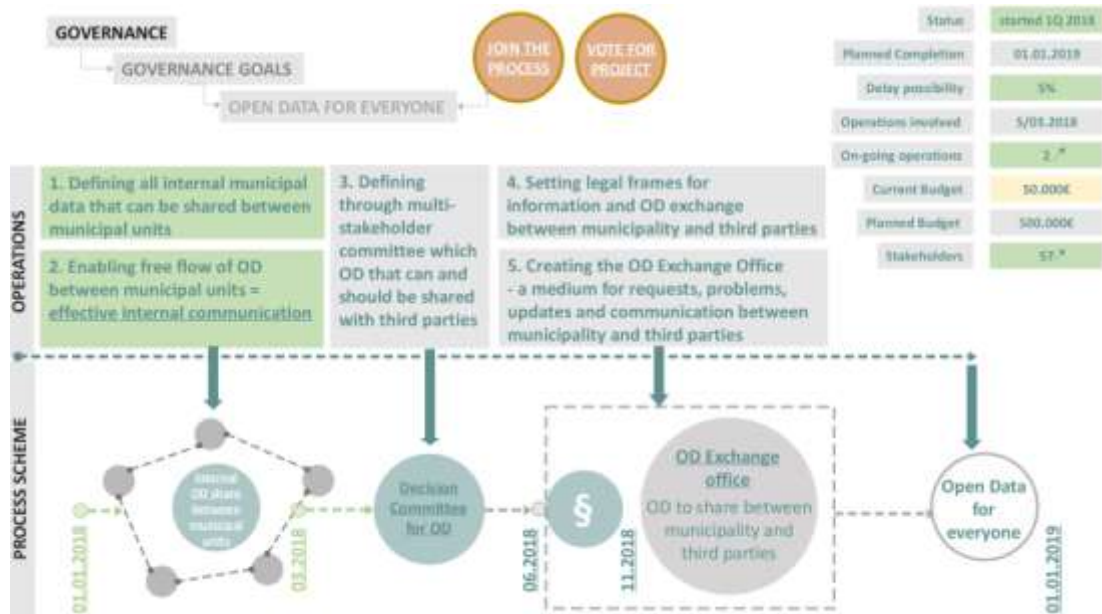


Figure 3 Operation overview. Cooperation platform of ModelCity+ (Own graphic. All rights reserved)

## 2.4. Challenges

While ICT-driven Smart Government has many positives and gives a wide palette of opportunities for sustainable and egalitarian urban transformation, there are some notable constraints that need to be considered while setting a new agenda.

### 2.4.1. Digital competencies

One of those challenges, regardless of the chosen transformation method, is lack of digital competencies among the municipalities’ staffs: “as it can be observed today, municipalities are starting to compete with companies from the private sector in recruiting qualified employees. From today’s perspective, cities are not competitive enough. Alone, the salary and budgetary

structures limit the systematic setting of IT competencies (BBSR, 2017)” within the governmental body. In highly developed Germany, numerous IT and technological companies have responded to this issue by offering diverse software tools and expert assistance. However, as the general awareness about digitalization rises, the threat of losing independence by relying on solutions that are not fully manageable and understandable becomes a real issue. In addition, as many such outsourced services would need to be covered from public funds, the risk of losing the trust of civil society because of the poor digital literacy of governmental staff becomes high. Therefore, an initial investment in building expert groups and disrupting the governmental structures is needed in order to achieve a serious communication foundation in collaborative democratic processes (Altenburger, 2014). According to BBSR (2017), “municipalities need to win qualified IT-staff through offering innovative incentive measures (for example through offering attractive working models) and more importantly, maintain them for the long term. If cities do not manage to build such structures (...) the dependency on IT and technology companies will clearly increase”.

#### 2.4.2. *Participation turnout*

The participation of third parties is another aspect that is often questioned in the context of collaborative democracy and Smart Government, as low participation turnout significantly devaluates their principal pillar. According to Open Government Partnership (2018), the “recent political events sweeping democratic strongholds around the world reflect a deep loss of faith in government. Citizens perceive their institutions to be captured by elites who are disconnected from the needs of their constituents or complicit in schemes that benefit the powerful at the expense of ordinary citizens”. The actual problems lie in a general distrust and lack of inclusive participation tools, as well as in failed participatory ventures.

In 2014, a Polish city, Gdynia, started their annual program called Civic Budget Gdynia, where citizens can choose and vote for the projects they find essential for their districts. The goal was to execute the final chosen concepts from tax-based funds that were already available explicitly for this purpose. In the first two years, turnout reached 17.1% (2014) and, a year later, over 20%, gaining attention on a citizen level. However, in 2016, the attendance rate decreased to 18.49% and two years later reached its lowest level of 13.04% (Budżet Obywatelski Gdynia (Civic Budget Gdynia) (BO), 2018). The reasons are diverse. From urban activists’ view, the project portfolio contains repeatable, unsatisfactory projects, which are constrained by small district budgets in their size and complexity. The portfolio also lacks bigger-scale, pan-city projects that would serve all citizens, not only the chosen minority, and would strengthen an idea of collaborative democracy. In addition, in 2016, more than half of the chosen investments were executed in unsatisfying ways or were not finally realized, and the argumentation provided by the local government was not transparent enough for public opinion, which significantly lowered willingness for further participation (Szczerba & Moritz, 2017).

#### 2.4.3. *Data privacy*

Chapter 2.2.1 introduced two regulations at the pan-European level regarding data flow. Although the above national legal frameworks are given for further policy-making, country-specific data privacy laws are still one of the key points in discussions regarding Smart Cities. Without certain legal regulations and sustainable intersectoral cooperation, many aspects of Smart Government might not be realized. However, without a clear, security-oriented data-protection policy, third parties might be less interested in active involvement (BBSR, 2017). The question of openness in terms of privacy also applies to administrative structures and their general working cultures. Many units cannot or are not used/willing to share their data; therefore, additional policies regarding data exchange within the government itself are essential to start bringing some of that data to the external parties (Kischporski, 2017).



### 3. CONCLUSION

Smart Government, which benefits from technological development, pragmatic approaches, and new working methods, can create the missing link between government and other city stakeholders. Regardless of the chosen digitalization approach, if cooperation, communication, and efficiency become a central point of this transformation, a new type of decision-making and policy formulation can be created that will distribute the workload and responsibility in process conduction to every level.

The author found it useful to summarize this paper in the form of a charter. Based on the information given in previous chapters, 8 key points for building a sustainable Smart Government were selected to give a general direction toward agenda setting: (1) Expand municipal digitalization and improve its digital competencies; (2) Redefine cooperation methods between government, politics and civil society; (3) Clearly define the cooperation rules and sphere of influence; (4) Every stakeholder shares the responsibility decision-making and the execution of the chosen strategies; (5) Make room for innovation and a higher acceptance for risk-taking; (6) Regulate data privacy matters without slowing innovation and development; (7) Guarantee security, fairness, and egalitarianism; and (8) The utmost goals are connectivity, cooperation, and communication.

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