

Measuring digital transformation at the local level: Assessing the current state of Flemish municipalities

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Abstract

The aim of this article is to provide a way to measure digital transformation (DT) at the local government level and to provide insight into the empirical situation of Flemish local governments. At the national level, several indexes exist to measure digital government performances, but an equivalent at the local level is missing. This research adapts the Digital Government Index, with six dimensions that characterize a digital government, for use at the local level. We conducted a survey of Flemish local governments to assess the current state of their DT. This article contributes to the literature by gaining a better understanding of DT and by developing an instrument to measure DT at the local government level. The results show which dimensions are more established and emphasized than others in practice and give local governments the opportunity to measure and also benchmark themselves regarding their DT.

Keywords

Digital Transformation, Local Government, Flanders, Digital Government Index, Survey Research.

1. Introduction

The public sector faces an ever-increasing demand to provide more efficient and effective public service delivery and to generate more public value creation. The process of digital transformation (DT) helps to achieve those outcomes. DT goes beyond the mere alteration of existing offline processes into a more digital format. It is about managing cultural, organizational and relational changes. This term, adopted from the private sector, is also profoundly changing the way public administrations operate [1].

For national public administrations, several indexes exist to measure DT, such as the Digital Economy and Society Index (DESI), E-Government Development Index (EGDI) and the Digital Government Index (DGI) [2], [3], [4]. However, these indexes cannot readily be applied at the local government level, and an equivalent specifically designed for local governments is lacking. Local governments also need to undergo this process of DT, but there is no instrument available helping them to assess and measure what a digitally transformed local government looks like as opposed to other levels of government. Additionally, there is little empirical evidence about DT in local governments [2], [5], [6].

Therefore, the aim of this research is to develop an equivalent for local public administrations, based on one of the existing indexes for the national government level, and to use it for assessing the current state of DT in local governments in the Flemish region in Belgium. When examining the difference in focus among the above mentioned indexes, we specifically opted for the DGI as it fitted best with the holistic approach emphasized by DT. As a result, this research provides an instrument that Flemish local governments can use to assess and measure the current state of their DT, and also gives them the opportunity to benchmark themselves against other local governments in Flanders. Besides expanding the literature about DT on a local level, this paper also gains valuable insight into the empirical situation of local governments in Flanders.

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2. Digital transformation in local public administrations

2.1. Definition and characteristics of digital transformation

Digital transformation (DT) refers to “*a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies*”[5]. This term, which originated in the private sector, is also highly relevant in the public administration context [1]. Governments are urged to consider DT as a way to improve public service delivery [8] and create more public value [2].

Citizens and businesses expect more efficient and effective public services. Research shows that public administrations who engage in DT are more productive and more effective than public administrations who do not [9]. Driving a successful DT entails actively pursuing more transparency, striving for more interoperability, aiming to obtain higher levels of citizen satisfaction and managing new ways to interact and collaborate with stakeholders [1]. DT entails a change of functioning on an organizational, cultural and relational level [1], [5], [10], [11]. It goes beyond the mere digitalization of offline government processes and focuses on a more holistic approach [1].

Compared to other levels of government, local governments struggle with specific issues regarding their DT journey. Some of these challenges exist of lacking (financial) resources, the need to provide citizens with a high variability of public services, and missing a strategic approach to tackle their DT journey [2], [5]. On account of the specific conditions they face, measuring and assessing DT in local public administrations is rather difficult and signifies the need for increased attention.

2.2. Measuring DT

There is a lack of existing indexes to assess local governments regarding their DT journey. Therefore, the purpose of this research is to provide local public administrations with an instrument to measure and evaluate their DT. Indexes to benchmark governments in terms of DT predominantly focus on the national level, including the DESI, the EGDI and the DGI. The DESI, issued by the European Commission, measures and compares the digital competitiveness of European member states by means of digital performance indicators. The DESI focuses on four fundamental dimensions of the 2030 Digital Compass policy: human capital (focus on digital skills), connectivity (matters involving broadband), integration of digital technology (digital intensity, technology and e-commerce) and digital public services (e-government) [3]. These dimensions target “*a comprehensive and sustainable digital transformation across all sectors of the economy*” [3]. The EGDI, issued by the UN, on the other hand, measures the provision of public services by means of information and communication technologies (ICT) [2] and entails three crucial components: Online Service Index, Human Capital Index and Telecommunication Index [12]. Lastly, the DGI, issued by the OECD, discusses six dimensions of a digital government: digital by design, data-driven, government as a platform, open by default, user-driven and proactiveness. These six dimensions “*measure the level of maturity in digital government strategies*” [4]. Each of these six dimensions are divided into several indicators by which OECD member and partner countries can verify where they stand concerning the maturity of their digital government strategies.

When analyzing the different indexes, it is crucial to underscore that there exists a substantial difference between digitalization and DT. Digitalization primarily concerns alterations in processes that extend beyond the mere transition from analog to digital services, and thus surpass the mere digitization of pre-existing processes and forms. Whereas digital transformation prominently accentuates cultural, organizational, and relational changes within organizations, exceeding the scope of digitalization [1]. Certain indexes better fit this definition of digitalization, whereas others demonstrate a stronger fit with the definition of DT.

Comparing the three indexes to the definition and characteristics of DT, the DGI covers the aspects of DT more holistically. While the focus of the DESI and the EGDI is more limited to digitalization [3], [12], the DGI is better at capturing changes at the organizational, cultural and relational level [4]. The dimensions 'government as a platform', 'open by default' and 'user-driven' capture the need for governments to show a more open culture and collaborate with other government organizations, citizens and businesses. The dimensions 'user-driven' and 'proactiveness' point to the importance of an agile culture [15]. As a result, this article will build further on the DGI for measuring DT.

Maturity models have been criticized in previous research. Originally, the concept of e-maturity in public administrations merely focused on the perspective of using Information and Communication Technologies (ICT) when delivering public services, and providing citizens with a one-stop-shop [13]. The main point of criticism states that e-maturity models operate under the assumption of a linear progression leading to a conclusive stage. However, every (local) public administration evolves at a different pace regarding their e-maturity, so a refocus of this concept was needed [13]. Maturity should be approached as a concept that is relative and dynamic in nature, influenced by both contextual factors and time [14]. As opposed to being an absolute measurement, e-maturity has to be looked at as a continuous and ongoing process of adaptation to an always changing digital government environment [14]. In this article, we approach the DGI as a dynamic way to measure and assess the concept of DT. What is mature today will change, but being aware of how far you have progressed as a (local) public administration concerning your DT journey is important to take into account, and to make further improvements to digitally transform.

2.3. Local public administration context

Local governments play a very important role when it comes to providing effective and qualitative public services [5]. As the level closest to the citizens, they are often considered to be the most-trusted level of public administration [16]. Nevertheless, local governments are frequently confronted with many complex (digital) challenges, such as assuring service continuity during the COVID-crisis and working towards interoperability while quickly designing new services that take into account the changing needs of citizens.

There is little empirical evidence about DT in local governments [2], [5], [6]. Research has been conducted on the current state of digitalization in German local authorities with a particular focus on the implementation, impact and constraints arising from digitally transforming as a local government [5]. Other research identifies priorities and critical success factors in the DT of local governments in Greece [2]. Different driving and impeding factors that are influencing DT in different local authorities (Italy, China, Belgium and the Netherlands) have also been examined by different scholars [8], [13], [16]. In addition, other research explores the main drivers and challenges Australian local authorities come in contact with during their DT [6]. Furthermore, the little empirical evidence about DT in local governments mainly discusses the barriers, hurdles, challenges, priorities, success factors and drivers of DT at the local level [2], [5], [6], [13], [18].

In sum, existing research mainly focuses on drivers and challenges associated with DT at the local level, but it does not engage in a measurement of DT. Hence, this paper wants to help fill this gap in academic literature and provides local governments with an instrument to assess and measure their DT process.

3. Methodology

The goal of this research is to contribute to the literature by providing an instrument to measure DT at the local level and to gain valuable insight into the empirical situation of Flemish local governments. In order to empirically assess and measure the current state of their DT, and also give them the opportunity to benchmark themselves against other local governments in Flanders, we adapted the OECD's DGI to the local government level and identified indicators to assess Flemish municipalities.

Local governments in Belgium, as well as in other countries, are increasingly urged to embark on their DT journey, but they mostly face the same challenges. They often struggle to obtain sufficient (financial) resources.

Besides that, they are the government level that offers the highest variability of public services in direct contact with their citizens, and often lack strategic orientation when it comes to their DT [2], [5]. Therefore, local governments in Belgium, and the scope this research is focusing on in Flanders, form a representative and interesting context to conduct research on. There is a wide variety in size among Flemish local governments. There are 300 municipalities who are all digitally transforming at an uneven pace due to this difference in size, and additionally their difference in resources.

Based on the OECD's DGI, one of the researchers adapted the indicators for each of the six dimensions of a digital government into indicators suited for the local government context [19]. The researchers first verified if the dimensions of the OECD's DGI were also applicable at the local government level. After this verification, the three most important indicators per dimension were selected by one of the researchers. The researchers translated the original questions to Dutch and made sure they were comprehensible and applicable in a Flemish local government context. The applicability of the dimensions and indicators was also discussed with three experts with at least fifteen years of experience in the digitalization of local public administrations (a Smart Region Coordinator at the Provincial level, a former General Director at a Flemish municipality, and one person working at a professional service organization to local public administrations) on their accuracy and feasibility.

A survey was carried out to examine the presence of the six dimensions [19] and test the translation of the indicators in Flemish local governments. Survey methodology is an appropriate research method *"to gather information from (a sample) of entities for the purposes of constructing quantitative descriptors of the attributes of the larger population of which the entities are members"*[20]. To examine to what extent the six dimensions of the DGI are present in Flemish local governments, we used a Likert scale to question the respondents about the indicators. The scale varied from 'this does not apply to our local government' (1) to 'this is an essential part of our functioning' (5). Local governments also had the option to indicate they 'did not know'.

The survey was conducted between the 10th of December 2021 and the 5th of January 2022 and was addressed to 386 managing directors and assistant managing directors of local governments in Flanders. Managing (assistant) directors have extensive knowledge of how their local governments function, and have the organizational overview that is required for answering questions related to DT. If managing (assistant) directors would not be familiar with every aspect of their municipality's DT journey, that also shows how far their DT is institutionalized. This survey was sent out to a mailing list available at a private sector corporation who specializes in helping governments reach more efficient and innovative software solutions on the 15th of December 2021, and they received an email reminder on the 30th of December 2021. In addition to the emails, personalized letters were also sent out to the same target group. To ensure that the size of the survey would remain manageable for respondents, we decided to only select three indicators per dimension. Out of the target group of 386 managing directors and assistant managing directors of local governments in Flanders, 172 have responded providing our survey with a 44% response rate [21].

4. Results and analysis

Figure 1 gives an overview of the results we derived from our survey. In this section, we take a closer look at the current state of DT in Flemish municipalities, compare the results to those of the federal government in Belgium, and summarize the findings per dimension. In general, there were no significant differences between municipalities with a medium size and those with a smaller size (less than 70.000 inhabitants). Bigger cities with more than 100.000 inhabitants did score significantly higher on all dimensions. Municipalities with less than 3 people in the ICT department scored lower, but the differences with municipalities with IT departments of a larger size were limited.

Figure 1: The current state of local public administrations in Flanders on the six dimensions of a digital government

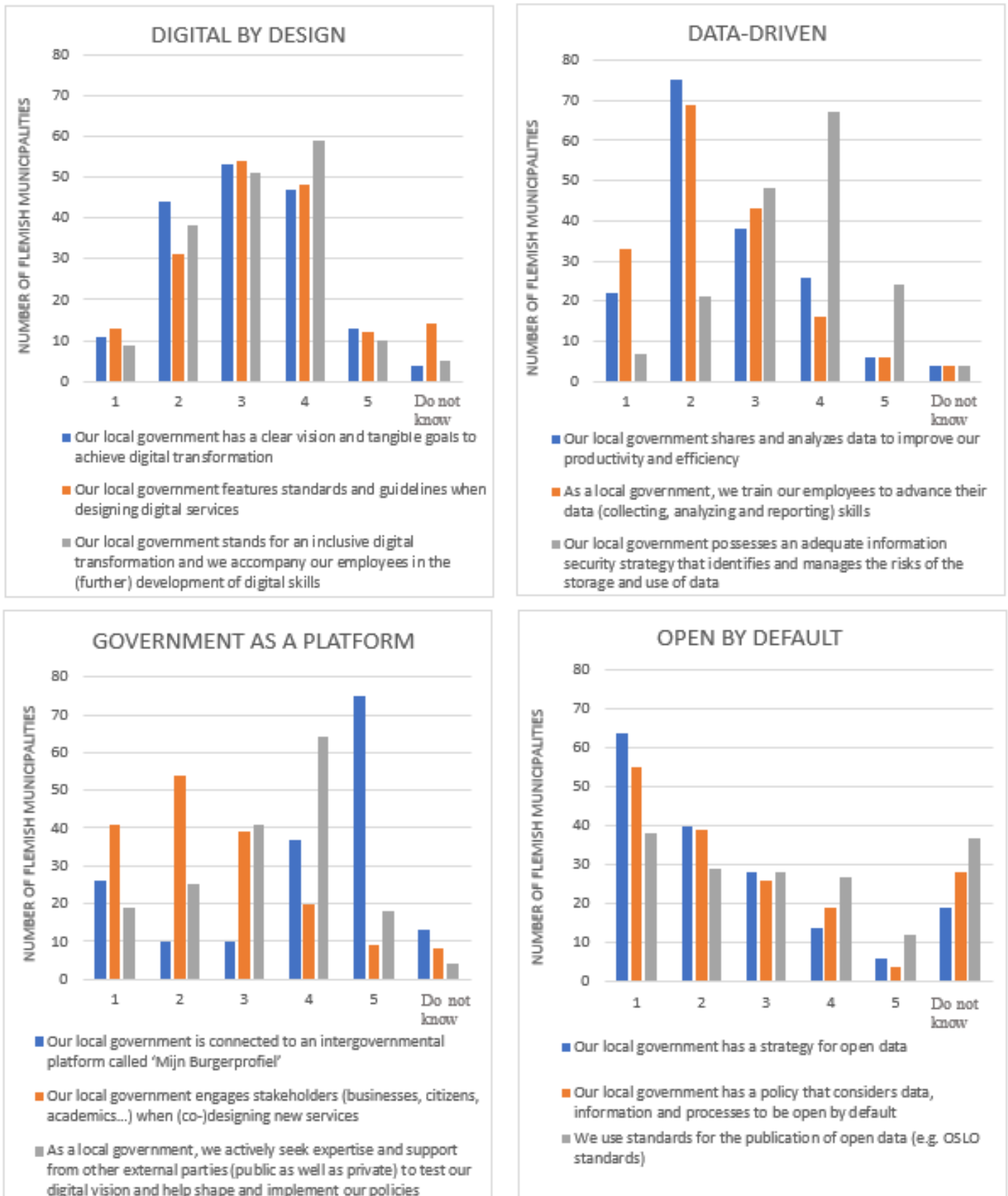
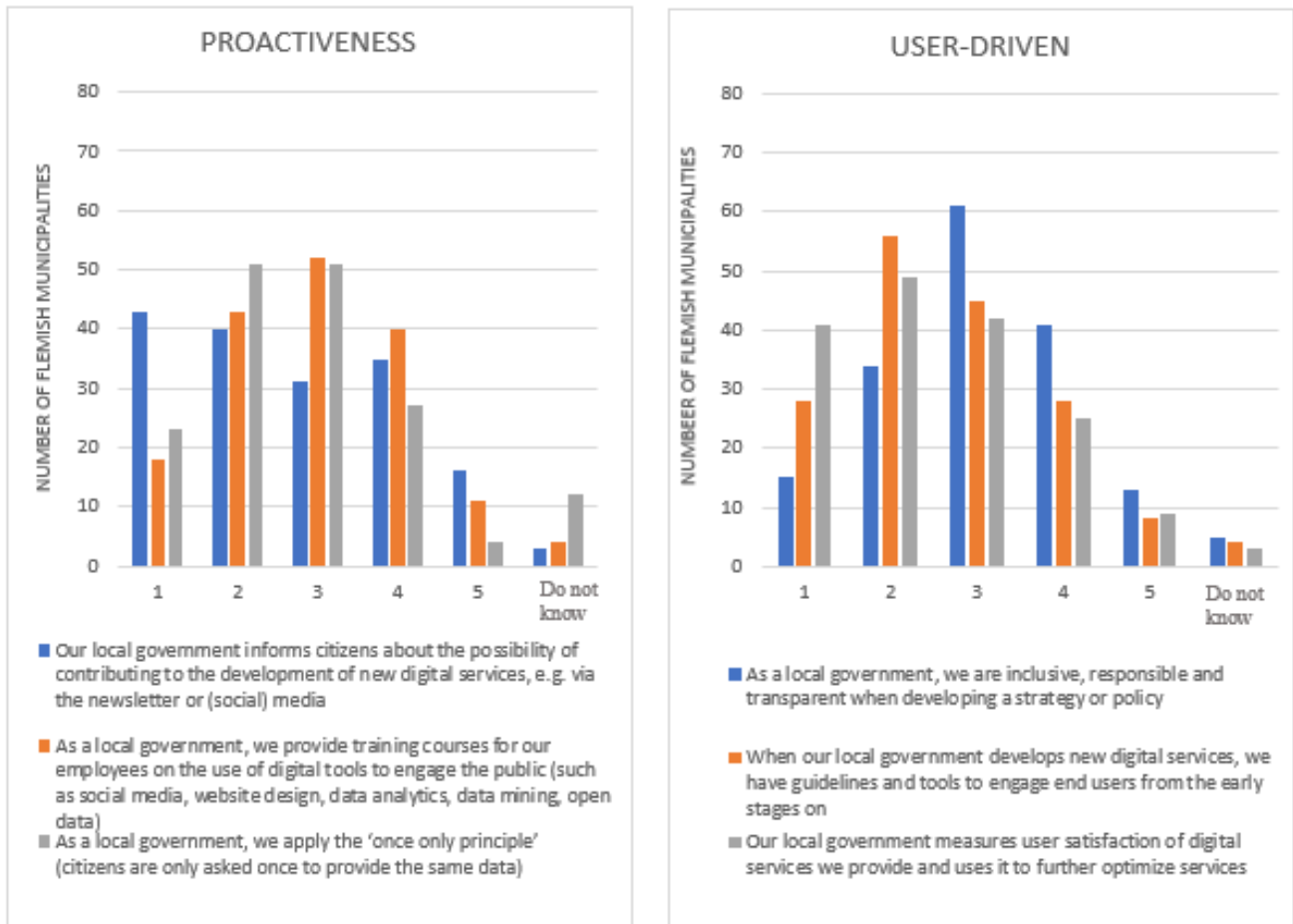


Figure 1: the current state of local public administrations in Flanders on the six dimensions of a digital government



Scores from 1 (does not apply to our local government) to 5 (essential part of our government functioning)

‘Digital by design’ is defined by the OECD (2020) as “the extent to which a government leverages digital technologies to rethink and reengineer public processes, simplify or encapsulate procedures and create new channels of communication and engagement with public stakeholders for a more efficient, sustainable and citizen-driven public sector. A digital by design approach refers to deploying digital technologies from the start into government’s efforts to modernize service delivery and adopt strategic mechanisms to ensure their coherent design, implementation and monitoring, no matter the channel services are offered.” For the context of local public administrations, we translated this into the following three indicators: (1) our local government has a clear vision and tangible goals to achieve digital transformation, (2) our local government features standards and guidelines when designing digital services and (3) our local government stands for an inclusive digital transformation, and we accompany our employees in the (further) development of digital skills. The results of our survey show that the scores of the local governments are distributed, with only a few municipalities receiving extremely low or extremely high scores. Remarkably, there are still a number of municipalities that do not follow standards and guidelines when designing digital services. Some of them do not invest in developing the digital skills of their employees. For this dimension, the scores of Flemish municipalities largely align with those of the federal government [19], [21].

‘Data-driven’ is defined by the OECD (2020) as *“the extent to which a government generates public value through the reuse of data in planning, delivering and monitoring public policies, and adopts ethical principles for trustworthy and safe reuse of data. In a data-driven public sector, data are understood as enablers for designing policies and services. Data-driven governments ensure that public sector data are shared inside and/or outside the public sector in a trustworthy fashion, and under clear protection, privacy, security rules and ethical principles for national and public interest.”* For the context of local public administrations, we translated this into the following three indicators: (1) our local government shares and analyses data to improve our productivity and efficiency, (2) as a local government, we train our employees to advance their data (collecting, analyzing and reporting) skills and (3) our local government possesses an adequate information security strategy that identifies and manages the risks of the storage and use of data. Our results show that municipalities score much lower on ‘data-driven’ than on ‘digital by design’. Especially when it comes to sharing and analyzing data and training their employees in these matters, the majority rates themselves as beginners. On the other hand, a lot of municipalities do indicate that they have an information security strategy in place. The use of data is a fundamental aspect on which many other dimensions build further, so local governments should invest in reaching a data-driven government. Both Flemish municipalities and the federal government score themselves rather low on ‘data-driven’ [19], [21].

‘Government as a platform’ is defined by the OECD (2020) as *“the extent to which a government provides clear and transparent sources or guidelines, tools, data and software that equip teams to deliver user-driven, consistent, integrated and cross-sectoral service delivery standards. Government as a platform approach calls for the deployment of a wide range of platforms, standards and service assisting teams to focus on user needs in public service design and delivery rather than on technological solutions.”* For the context of local public administrations, we translated this into the following three indicators: (1) Our local government is connected to an intergovernmental platform called ‘My Citizen Profile’, (2) our local government engages stakeholders (businesses, citizens, academics...) when (co-)designing new services and (3) as a local government, we actively seek expertise and support from other external parties (public as well as private) to test our digital vision and help shape and implement our policies. Our survey shows that the majority of local governments are connected to the intergovernmental platform ‘My Citizen Profile’. This does not automatically mean that they incorporate all the principles of this dimension in their functioning. For instance, establishing sustainable partnerships remains a challenge. In general, the scores of Flemish municipalities on this dimension largely align with those of the federal government [19], [21]. However, it is necessary to highlight that the definition of this dimension, along with the first indicator concerning the intergovernmental platform, should be critically reviewed. Local governments do not have the resources to build platforms themselves, so the authors chose to focus on the use of digital platforms developed by other government levels. The choice of the use of one such digital platform which is extremely well used by municipalities, ‘My Citizen Profile’, gives an overestimation regarding their platform capability.

‘Open by default’ is defined by the OECD (2020) as *“the extent to which a government unites technology and data within the limits of available legislation and in balance with public interest. An open by default approach describes the extent to which data, information, systems and processes are open unless there is a compelling reason for them not to be, helping build bridges between all actors in order to collect insights towards a more knowledge-based public sector.”* For the context of local public administrations, we translated this into the following three indicators: (1) our local government has a strategy for open data, (2) our local government has a policy that considers data, information and processes to be open by default and (3) we use standards for the publication of open data (e.g., OSLO standards). This dimension is underexplored by 30% of the Flemish local governments. Depending on which of the three indicators we consulted, 10-20% of our target group did not even know whether this is being targeted at all in their organization. Concerning ‘open by default’, we notice a difference between how Flemish local governments scored themselves as opposed to the federal government [19], [21].

‘User-driven’ is defined by the OECD (2020) as *“the extent to which a government becomes more user-driven by awarding to people a central role thus placing their needs at the core of the shaping of processes, services and policies; and the right inclusive mechanisms for this to happen are adopted. Through engagement and collaborative mechanisms, policy processes, their outputs and outcomes are not just informed but shaped by the decisions, preferences and needs of citizens.”* For the context of local public administrations, we translated this into the following three indicators: (1) as a local government, we are inclusive, responsible and transparent when developing a strategy or policy, (2) when our local government develops new digital services, we have guidelines and tools to engage end users from the early stages on, and (3) our local government measures user satisfaction of digital services we provide and uses it to further optimize services. The three indicators associated with this dimension measure an increasing degree of maturity. This explains why more municipalities invest in being inclusive, responsible and transparent when developing strategies and policies, and why they invest less in measuring user satisfaction to optimize services. Both Flemish municipalities and the federal government score themselves rather low on the dimension ‘user-driven’ [19], [21].

‘Proactiveness’ is defined by the OECD (2020) as *“the extent to which a government has the ability to anticipate people’s needs and to rapidly respond to them so they do not even notice that services are delivered.”* For the context of local public administrations, we translated this into the following three indicators: (1) our local government informs citizens about the possibility of contributing to the development of new digital services, e.g. via the newsletter or (social) media, (2) as a local government, we provide training courses for our employees on the use of digital tools to engage the public (such as social media, website design, data analytics, data mining, open data), and (3) as a local government, we apply the ‘once only principle’ (citizens are only asked once to provide the same data). The results regarding this dimension show that only a minority of Flemish local governments indicate ‘proactiveness’ as an essential part of their functioning. For this dimension, we also notice that the scores of Flemish municipalities largely align with those of the federal government [19], [21].

This article contributes to both the literature and practice. It contributes to the literature by gaining a better understanding of DT at the local government level. Whereas existing literature is mostly focused on the hurdles, challenges, priorities, success factors, drivers, impact, implementation and constraints of DT [2], [5], [6], [13], [18], this article developed an instrument to assess and measure DT at the local level, and helps to fill the associated research gap. In addition, it also contributes to practice in different ways. This article gives a first overview of the current state of DT in Flemish municipalities, and shows which dimensions of a digital government are more established than others, and which are most emphasized in practice. Our results display that there is still a lot of room for improvement with regards to the digital government dimensions ‘data-driven’, ‘openness’, ‘proactiveness’ and ‘user-driven’. In addition, we also compared our results to previously conducted research regarding digitalization at the Flemish local government level [22]. Our results show that, many years later, the same obstacles remain. Although public service provision has definitely improved since then, we recommend to give additional attention to the use of data in policy and service delivery. Also working together in ecosystems still requires a considerable effort. Flemish local governments should take these recommendations into account since they help shape the foundation of the most successful DT projects [16], [21].

Further research can build on this first attempt to develop an instrument to measure DT at the local level. Factor analysis showed a lot of consistency between all the indicators, and did not confirm the underlying structure of six dimensions as fundamentally different concepts. This indicates that more research is needed to develop a rigorous instrument for measuring DT at the local government level.

5. Conclusion

This research developed an instrument for Flemish local governments to assess and measure the current state of their DT. The results presented in this study were derived from a survey the authors conducted questioning managing directors and assistant managing directors of Flemish local governments. It shows which dimensions of a digital government are more established than others, and which are most emphasized in practice. Although most Flemish municipalities already engage in these different dimensions, we found that there is still a lot of potential for Flemish local governments to boost their digital maturity and advance in their DT journey.

This research is however not without limitations. Context is important, and there will be different bottlenecks between sizes of local public administrations. This research provides a general overview of what the current state of DT is in Flemish local governments and provides an initial impetus that helps to measure and evaluate local public administrations regarding their DT. The choice for a limited number of indicators was to maximize the response rate, and to give a more complete view of the Flemish local government landscape, but additional research is necessary. We encourage other researchers to expand these indicators and to develop a more comprehensive insight into the DT of local public administrations.

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