An Empirical Analysis of the Perceived Usefulness of Digital Governance Tools among Heterogeneous Swiss Municipalities

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Abstract

Digital governance tools have the potential to enable more efficient and less error-prone governance processes. However, the heterogeneity among municipalities might affect their willingness and purposes to use such tools, for which we have limited evidence. This study analyzes results from a survey among Swiss municipalities with different population sizes, focusing on their evaluation and prioritization of digital governance tools. The results show that for some governance areas, such as strategy formation & monitoring and project portfolio management, the perceived usefulness of these tools increases with municipality size, while the perceived use of them for data collection is generally lower. Smaller municipalities are more likely to reject new digital governance tools, with a general skepticism of the usefulness and the financial situation indicated as the most common reasons. Medium to large municipalities show additional reasons for the rejection, rooted in their more prevalent previous or current use of digital tools.

Keywords: digital governance tools, smart cities, smart governance, public value, municipal heterogeneity, digitalization

1. Introduction

Not only the global issues such as climate change and pandemics but also current trends like the growing urbanization and an aging society pose challenges to municipalities and push them to transform themselves towards innovation and sustainability. At the same time, municipalities have to manage limited resources such as water, energy, or financial facilities to cope with these challenges and their effects on the well-being of their citizens. As a response to these challenges, the smart-city concept, which refers to using information and communication technologies (ICT) to improve the effectiveness of municipal operations (Nam & Pardo, 2011), has come into prominence with a growing number of practical applications and contributions in the scientific literature. More and more municipalities strive to develop, implement, and monitor smart-city projects to be more efficient, innovative, sustainable, and agile in delivering citizens' demands.

One dimension of the smart-city concept relates to smart governance where the idea is to use technology and innovation to facilitate and support enhanced decision-making and planning within the administration (Albino et al., 2015; Lopes, 2017), but which also includes action fields such as transparency, smart-planning, ICT & e-government (Vishnivetskaya & Alexandrova, 2019). The goal is to improve the existing practices in the respective action fields such as exploiting the power of digitalization to have a more efficient project planning and management. The dimension of smart governance is interrelated with other smart-city dimensions (e.g., smart mobility, smart environment, etc.) since it provides the infrastructure for the governance and management of the projects/actions taking place within their scope.

Digital governance tools have been developed and promoted with the idea of utilizing digitalization to improve planning and decision-making processes among government units (e.g., municipalities) (Panori et al., 2021). They have the potential to boost overall smart-city goals because they enable municipalities to develop, implement, and monitor smart strategies. These tools can serve as a digital infrastructure capable of supporting different parts of the strategy

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process from strategy formation to implementation and monitoring, including tasks such as project management, project portfolio management, and data collection (Wäspi et al., 2022). Previous research among Swiss municipalities revealed that many of these tasks are often still paper-based or rely on scattered excel sheets, which makes them error-prone and inefficient (Wüst et al., 2022). Digital governance tools can thus be a way of improvement by easing the burden of data collection and data management for monitoring and providing user-friendly interactive interfaces for strategy development and project (portfolio) management.

Nonetheless, it should be considered that municipalities are diverse. They can differ in a multitude of aspects, such as population size, degree of urbanization, or available resources, which can affect their priorities and actions. However, we have little information about how municipal heterogeneity affects the willingness and purposes of using digital governance tools. Some municipalities may find them irrelevant, complex, or not the most straightforward way to develop and monitor their strategies. Others might be keen to adopt such tools for generic purposes rather than smart-city goals such as project management. The present research aims to expand the body of knowledge in this regard. The focus of the research lies on the municipality level in Switzerland. Swiss municipalities have a wide range of sizes ranging from less than 10 to several 100'000 inhabitants (BFS, 2022). In the Swiss federal system, municipalities have a wide and diverse array of competencies and responsibilities regarding their self-organization. They range from infrastructure construction and maintenance, over social welfare, to culture and environmental protection (Ladner & Haus, 2021). This wide range of responsibilities, coupled with often limited financial and human resources, opens the question of if and where digital tools could help to enable a smarter government by increasing efficiency and coherence in the administration and what potential hurdles exist for their adoption. The present paper analyzes Swiss municipalities with different population sizes and compares their opinions on digital governance tools quantitatively. The paper aims to answer the following questions:

1. In what areas do municipalities think new digital tools would be useful? Do the stated areas vary with municipality population size?

2. What kind of municipalities do not want or need new digital tools? What are the primary reasons not to use such tools?

Answering these questions enables us to identify the relevant audiences (i.e., the types of municipalities) for digital governance tools and provides insights into their use cases in municipalities of different sizes. Furthermore, the answers help to reveal potential reservations against such tools and their differences among municipalities with different population sizes. Together, the analysis sheds light on the usefulness of digital governance tools and their dependence on municipal heterogeneity regarding population size.

The rest of the paper is organized as follows: The next section discusses the related literature regarding the concept of smart city more broadly and smart governance tools specifically. Section 3 introduces the methodology and the collected data from the Swiss municipalities. Section 4 demonstrates the obtained results and interprets them. The final section summarizes the current and future research and concludes the paper.

2. Theoretical Background

This section discusses first the smart-city concept and its importance and role in transforming municipalities towards sustainability and innovation. Then, it touches upon digital governance tools and their relevance in developing and monitoring strategies.

2.1. The Smart-City Concept

The smart-city concept has been introduced with the assumption that the integration of information and communication technologies (ICT) can help to iron out the acute problems that cities are currently facing and mitigate the adverse effects of challenges, such as urbanization and climate change, on citizens' quality of life (Dameri, 2013). Many municipalities around the world strive to implement the concept to be more sustainable, efficient, livable, and equitable (Angelidou, 2015; Wäspi et al., 2022). Although smart cities are often associated only with the use of technology and described from a technical point of view, the concept is broader and compromises environmental, economic, legal, and social aspects.

The smart-city concept consists of many dimensions. Although there is not yet a complete consensus in the literature on the set of such dimensions, many studies agree on the ones illustrated in Figure 1 (Giffinger & Gudrun, 2010). Each dimension consists of multiple action fields[1], which we discussed in detail in previous work (Wäspi et al., 2022). Municipalities can assess the current state in the different action fields and define

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[1]Action fields are named as indicators in some studies, such as (Letaifa, 2015; Mutiara et al., 2018)

targets for improvement. Connected with measures to reach the targets a strategy is formed. A strategy becomes smart when it is monitored continuously, i.e. the current state is continuously or periodically measured by key performance indicators (KPIs) for each action field and compared to the target state (Wüst et al., 2022). Many established KPI catalogs already exist, including one based on the smart-city wheel and its action fields (Cohen, 2013).

Figure 1. Smart-City Dimensions (Giffinger & Gudrun, 2010)

A smart strategy process has different requirements on different levels. The strategy formation requires the involvement of different stakeholders from politics, administration, and society. As mentioned in previous studies, strategy development should be transparent and consider public value as its goal (Neuroni et al., 2019). That is, the needs or desires of different stakeholders should be considered to obtain the maximum cumulative benefit for the public. The implementation of the strategy requires effective project management accompanied by a clear division of tasks and competencies and a project portfolio management that is tightly linked to the strategic goals. Strategy monitoring requires effective data collection, management, and analysis to observe the current state with respect to the strategic targets and detect trends. This enables to enact necessary course corrections and allows for emergent strategies (Wüst et al., 2022). Digital governance tools can provide the infrastructure to fulfill these requirements, as discussed in the next section in more detail.

2.2. Digital Governance Tools

Digital governance tools have been introduced and promoted with the idea of using digital innovations to enhance planning, management, administrative, and decision-making activities in public government bodies such as municipalities. They are sometimes referred to differently in the literature, such as smart governance tools or platforms or smart-city platforms. The terms are used interchangeably throughout this section.

Leclercq and Rijshouwer (2022) assert that digital platforms enable citizens' engagement in smart strategy development. They can provide an infrastructure for collaborative and transparent decision-making so that citizens can articulate and effectuate in these tools their concerns, views, and aspirations. As prominent smart-city applications show, such as in Barcelona, Vienna, or Amsterdam (Bakıcı et al., 2013; Fernandez-Anez et al., 2018), involving all relevant stakeholders in strategy development (i.e., decision-making) is the key to creating sustainable public value. Additionally, such platforms provide a shared database and support the development and enhancement of citizens' data literacy.

In a review of the literature, Tomor et al. (2019) also draw attention to the role of digital governance tools regarding participatory decision-making and transparency. They find that digital tools are deployed also for diverse tasks such as the collection of geo-data by sensors or monitoring greenhouse gases, or localized diversity of energy use, such as in (Laspidou, 2014; Wehn et al., 2015). In a wider perspective, these tools can enable to collect, store, and visualise data for corresponding action fields and indicators to monitor strategies in a smart way.

Lee et al. (2013) discuss the functionalities that digital tools used in the smart-city context should provide. The paper describes such functionalities as data collection, data processing, network, user interface, and security. Santana et al. (2017) touches on similar requirements and states the importance of handling big data. Today's data is fast (e.g., sensor data) and has a significant volume, giving it big data characteristics. The digital tools aiming to use data to monitor smart strategies should go beyond relational databases and be capable of handling and processing big data.

Panori et al. (2021) investigated the question of what type of digital platforms would facilitate the processes of innovation in municipalities across the EU. The paper describes that digital tools provide municipalities with functionalities such as data storage, online collaboration, data analytics, and forecasting. The paper presents, *OnlineS3*, a new digital governance

tool and asks about its usefulness to a target audience in a survey (n=686). They thus ask similar questions to ours, however, in an EU context and focused on one specific tool. The respondents stated that the tool's data processing, information sharing, and monitoring features were perceived as the most useful.

Barns (2018) discusses the role of digital platforms in supporting the delivery of smart-city initiatives by municipalities. The paper discusses especially data storage and visualization (i.e., dashboards) features and explains how these features facilitate smart-city governance tasks. It presents the applications of digital tools as case studies such as the CityScore tool from the city of Boston and the City Intelligence tool from the city of Dublin. Nonetheless, the paper puts little emphasis on the governance aspect of digital tools.

Taamallah et al. (2019) seek to answer two questions: What are the steps of developing smart strategies, and how to provide a common infrastructure to stakeholders for strategy development. The paper conducts a literature review to answer the former question and analyzes the steps followed by prominent smart-city applications such as those from the city of Amsterdam, London, and Vienna. The conducted literature review revealed that the definition of the problem, vision and mission, goals and objectives, and strategy together with strategy implementation and strategy monitoring are the most frequently used steps, which are similar to the ones mentioned in Wäspi et al. (2022) and Wüst et al. (2022). For the second question, a new web-based digital smart-city tool is presented that enables public and private stakeholders to cooperate and co-design strategies. The digital tool that the paper presents provides online forms for data uploading, databases for data storage, strategy design services, and an online forum for discussions among stakeholders.

Wüst et al. (2022) show, based on expert interviews, that digital tools for strategy formation & monitoring have a large potential to improve strategy practices in municipalities, however, hesitance towards digital tools is still large and tools for tasks like project management or budgeting are needed more. Bektas and Haller (2021) and Wüst et al. (2022) thus present a new digital governance tool where development is done in close collaboration with municipal lead users. The platform provides municipalities with functionalities to manage project portfolios, develop and monitor strategies, and collect, store, and visualize data for KPIs in different action fields.

To sum up, digital governance tools, with all their variants, are praised in the literature for their potential to help local governments to transform themselves into smarter municipalities thanks to functionalities such as collaborative strategy development, data-driven strategy monitoring, and data acquisition and management. However, less literature exists that discusses the potential of digital tools to transform the management and administration aspects of the municipalities' tasks, such as project- and project portfolio management. Furthermore, beyond theoretical models, very limited research exists regarding the actual wants and needs of municipalities, or their potential reservations against digital innovation. In the following section, we ask Swiss municipalities questions regarding the willingness and purpose of using such tools, analyze their answers quantitatively, and discuss the results.

3. Methods

The data for this paper stems from a survey among Swiss municipality officials which is described in section 3.1. The statistical analysis of the presented results is discussed in section 3.2.

3.1. Survey

Results from the same survey, discussing the guiding goals and values of Swiss municipalities as well as their role in the strategy formation & monitoring, have been previously published in Wäspi et al. (2022). Here, the main focus is the perceived usefulness of new digital tools and the reasons for their potential rejection. For the first part, participants were asked to select from a list of areas of governance where they think additional digital tools could be useful, or if they do not see a need for any additional tools (Q1). For the second part, participants, who indicated in Q1 that additional tools are not wanted, were asked to select from a list of reasons for the rejection of new tools (Q2). In both cases, multiple answers were permitted and free text answers could be given in case other than the predefined answers applied.

The online survey lasted from February 22 to March 10, 2022, and was sent to a sample of 1795 Swiss municipalities in the German and French-speaking parts of Switzerland with different population sizes. It was targeted at municipality officials that already deal with topics of digitization and innovation and/or are actively engaged in strategy formation and monitoring. The survey was created and sent using the tool *Qualtrics* (Qualtrics, Mai 2022), without offering any material incentives to the respondents. In total, 280 participants responded, with a subset of 204 participants providing answers for the relevant question Q1. Potential sampling biases exist on the Swiss federal level as the French-speaking part of Switzerland is underrepresented and no municipalities from the Italian-speaking part

were included in the sample.

3.2. Statistical analysis

We performed a statistical analysis of potential differences in the responses between municipalities with different population sizes. To guarantee large enough sample sizes in all cases, we grouped the 204 respondents to Q1 into three population size categories:

- small (<3000),

- medium (3000-10000),

- and large (>10000 inhabitants)

with a total of 108, 63, and 34 responses respectively (Figure 2). Question Q2 was only answered by the subset of respondents who indicated no wish for additional digital tools (66 in total), which is why we further reduce the population size categories to: small (<3000) and medium to large (>3000), with a total of 43 and 23 responses respectively.
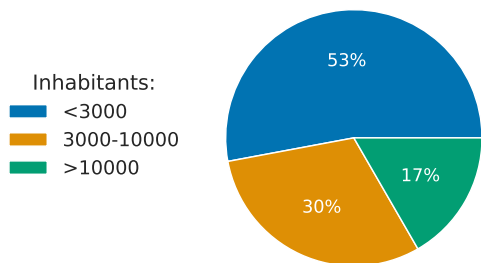

Figure 2. **Population sizes of the responding municipalities.**

To test differences among municipal population sizes in the responses to Q1 a χ^2-test was carried out, which is a common tool to test the relationship between two categorical variables (Franke et al., 2012). In the case of Q2, given the smaller sample size and the reduction to two population categories, the Barnard's exact test is more applicable. It tests the relationship of two categorical variables and is a more powerful alternative to the Fisher's exact test for 2×2 contingency tables (Barnard, 1947).

Within each population category we additionally pairwise compared the response proportions for the possible answers in Q1 and Q2 respectively. To test if the response proportions to two given options differ significantly the two sample Z-test for proportions was used (Zou et al., 2003).

The statistical analysis was performed in python using the functions *chi2_contingency*, *barnard_exact*, and *proportions_ztest* from the *scipy* package (Virtanen et al., 2020). Results are presented in Tables 1-4 located in the appendix.

4. Results & Discussion

4.1. Perceived usefulness of digital tools

To answer the first research question, participants were asked to indicate in which governance area they see a use for new digital tools in their municipality. The resulting response proportions are visualized in Figure 3.

While for some governance areas the assessment for the need for digital tools is similar across population size categories, for others the assessment differs significantly. The most significant difference between municipalities can be seen for the area of strategy formation & monitoring (see Table 1) with larger municipalities indicating significantly more often that a digital tool would be useful there (small: 32.4%, medium: 48.4%, and large: 67.7%). This result is in line with recently published results from the same survey, which showed that larger municipalities are more likely to have one or more strategies in place or planned, while small municipalities often still operate without dedicated strategies (Wäspi et al., 2022). The greater experience and engagement with strategy formation & monitoring in larger communities thus explains their stronger opinion that a digital tool could benefit them during this process. Despite the described strong dependence on municipality size, strategy formation & monitoring is still the most chosen governance area across size categories, although only statistically significant for large municipalities (Table 2).

Project portfolio management is the second governance area showing a significant correlation with population size (Table 1), with larger municipalities indicating more often that a digital tool would be useful for them there (small: 25.9%, medium: 41.9%, and large: 50%). This relationship can potentially be explained by the generally larger number of simultaneous projects that larger municipalities need to manage, increasing the relevance of efficient project portfolio management. This might be further supported by the perceived usefulness of additional digital tools for individual project management which is in a similar range as for project portfolio management, however without any dependence on municipality size (small: 30.6%, medium: 41.9%, and large: 35.3%; Figure 3).

Data collection surprisingly is the area where

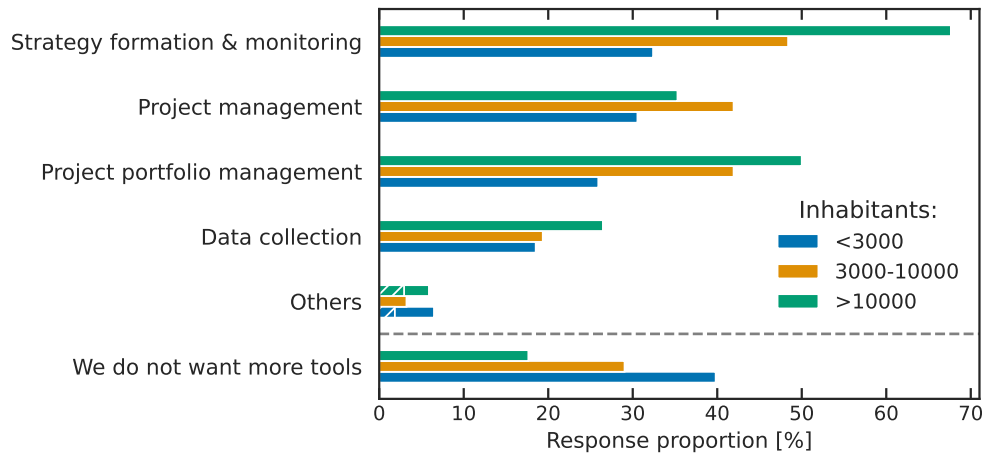**Q1: A digital tool would be useful in your municipality for:**

Figure 3. Distribution of answers to Q1 across the three population size categories (multiple answers were possible). The hatched bars for the answer "Others" indicate text answers which suggest the tools already in use are sufficient.

municipalities across size categories see the least use for additional digital tools, with response proportions (small: 18.5%, medium: 19.3%, and large: 26.4%) significantly lower than most other areas (Table 2). As discussed in section 2.2, data collection and management is one of the main use cases of digital tools discussed in the literature. This discrepancy between theoretical and perceived usefulness could either indicate, that the collection and flow of data in Swiss municipal administrations is already sufficiently optimized, or that data collection does still play a minor role in their everyday practice, limiting the need for optimization. The still generally limited degree of digitalization in Swiss municipal administrations, however, suggests the latter.

The small proportion of participants adding text answers under the option "Others" (small: 6.5%, medium: 3.2%, and large: 5.9%) suggests, that there are no areas where large portions of Swiss municipalities perceive an urgent use case for digital tools other than the ones already presented as options.

Taken together, the usefulness of digital tools for strategy formation & monitoring as well as project portfolio management for municipalities seems to scale with their population size. On the other hand, digital tools for project management are moderately useful for municipalities of all sizes, whereas the usefulness of digital tools for data collection is generally more limited.

4.2. Rejection of additional digital tools

The second research question concerns those municipalities which see no use in any additional digital tools, as indicated by the last option in Q1 (Figure 3). In total, one-third (33%) of the participants rejected the idea of additional digital tools, including 39.8% of the small, 29.3% of the medium, and 17.6% of the large municipalities. Municipalities with fewer inhabitants are thus significantly more likely to reject new digital tools (Table 1).

Participants who responded to Q1 with "We do not want more tools" were asked in Q2 for the reasons for their rejection (Figure 4). As only a third of the total number of participants thus saw and answered Q2, the medium and large population size classes were merged into one medium to large category ($\geq$ 3000) to still enable statistical analysis (see section 3.2).

The most stated reason for rejection in both size classes is skepticism about benefits (small: 53.5%, medium to large: 43.5%). In principle, other reasons could contribute to the indicated skepticism. In this case, 35% of the respondents from the small and 60% from the medium to large municipalities who expressed skepticism about benefits also co-selected other reasons: 21% (40%) financial situation, 9% (10%) lack of digital skills, 0% (20%) bad experience with previous tools, and 4% (10%) others for small (medium to large) municipalities respectively. This suggests that at least part of the skepticism against new digital tools is rooted in other factors such as a limited financial budget or a lack of digital skills.

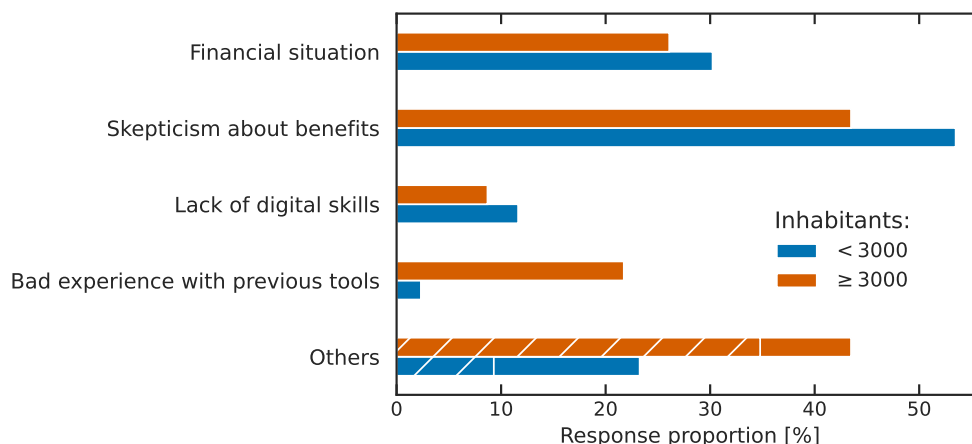## Q2: For what reason (or reasons) do you not want more tools?

Figure 4. Distribution of answers to Q2 across the < 3000 and ≥ 3000 population size categories (multiple answers were possible). The hatched bars for the answer "Others" indicate text answers which suggest the tools already in use are sufficient.

The financial situation is the second most indicated reason for the rejection of new digital tools across municipality sizes (small: 30.2%, medium to large: 26.1%). Participants across municipality sizes also respond similarly for lack of digital skills, which is only a small factor in their rejection of new digital tools (small: 11.6%, medium to large: 8.7%).

The only significant difference between size classes was found in the response for bad experience with previous tools (Table 3), with only 2.3% of the small but 21.7% of the medium to large municipalities indicating this as a reason for their rejection of new tools. This significant difference might be explained by the generally still low use of digital tools in small municipalities compared to the already more widespread adoption in medium to large municipalities.

The so far discussed hierarchy of indicated reasons is significant for small municipalities but only partially for medium to large municipalities, in part due to the smaller number of respondents (Table 4).

Noticeable in Q2, is the large number of responses in "Others" (small: 23.2%, medium to large: 43.5%), which indicates that important reasons for the rejection of new digital tools were missing from the predefined list of reasons. This reveals a clear weakness of the survey design, which should be addressed in future studies. A closer inspection of the given text answers revealed that 60% (small: 40%, medium to large: 80%) of the answers in "Others" indicated that the municipalities feel that the digital tools that are already in place are sufficient for their needs (Figure 4). Even a few text answers to Q1 have a similar content (Figure

4). If taken as a separate reason for rejection this would be en par with skepticism about benefits for medium to large municipalities and with lack of digital skills for small municipalities. If this option would have been in the list of predefined reasons potentially even more participants might have chosen it, which is why it can only be partially compared to the other options. However, the larger proportion of medium to large municipalities which indicate to be sufficiently covered with digital tools is a further expression of the generally larger experience with digital governance tools in larger municipalities.

Taken together, smaller municipalities are more likely to reject new digital tools, however, the reasons for rejection are partly similar. Among the largest reasons are the financial situation and a general skepticism against the usefulness of new digital tools, which is partly rooted in other factors. Although those reasons are similarly important for rejection in both size classes, the underlying causes, e.g. a tight financial budget, is more prevalent in smaller municipalities, explaining the higher total rejection rate. Differences in the rejection reasons exist mainly where they are related to the existing experience with digital tools. Larger municipalities have gathered more negative and positive experiences in the past, where the former causes rejection directly and the latter indirectly, as some municipalities perceive their current tools as already sufficient for their needs.

5. Conclusion & Outlook

In this study, we investigated the perceived usefulness of new digital governance tools in different governance areas and for Swiss municipalities of different sizes. For this purpose, we quantitatively analyzed results from a survey among 204 Swiss municipalities. The results showed that the perceived usefulness of new governance tools in the areas of project portfolio management and strategy formation & monitoring increases significantly with municipal population size, highlighting that the heterogeneity of municipalities and their practical realities result in different practical needs. This constitutes an important result, as in theoretical studies of digital governance innovation, the heterogeneity of practical needs is often neglected.

The results further show that the municipalities perceive new digital tools for project and project portfolio management generally as more useful than for data collection, which reveals a certain disconnect between the practical needs and the scientific literature. There, data collection is more often named as a necessary feature of digital innovation in governance than for example digital tools for project management optimization. This disconnect partly has its roots in the nature of scientific research, which is leading and exploring new paths of digital innovation in governance, while their real-world adoption in the municipalities is often lacking behind. However, to be able to bring municipalities towards digital innovation more effectively, it is important to learn about their actual needs, wants, and experiences.

To this effect, this study also investigated the existing reservations against the adoption of new digital tools and their underlying reasons. The results showed that small municipalities are significantly more likely to reject new digital governance tools than larger ones. Municipalities that indicated reservations against new digital tools of all sizes, mostly mention similar reasons such as the financial situation and skepticism about the benefits. However, these factors seem to be more prevalent in smaller municipalities, leading to the higher rejection rate. Medium to large municipalities further indicated additional reasons for rejection, such as bad experiences and an already sufficient coverage with digital tools. The results reflect the already more advanced state of digitalization in larger municipalities, entailing the accumulation of both good and bad experiences. The results also revealed drawbacks in the survey design as it did not cover all important reasons for rejection, such as the sufficient coverage with digital tools, which was instead indicated in additional text answers.

Although the present study remains limited with respect to the survey design and the equal representation of all parts of Switzerland, it constitutes an important first step to answering urgent questions about the perceived usefulness of digital tools as well as existing reservations against them. To gain an even deeper insight into the everyday practices, needs, and mindsets of Swiss municipal administrations, a more thorough and detailed survey design is needed. Future studies will strive for a more complete picture of the heterogeneity of Swiss municipalities and will collect detailed information not only on the current state of digitalization in municipal administrations and the previous and current experiences with digital governance tools but also on their plans and hopes for the future. With this, we hope to further contribute to the closing of the gap between the scientific research and the lived reality of municipal administrations.

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Appendix: Statistical tables

Table 1. χ^2-**Test of independence between population size and the need for new digital tools in specific areas** $(p < 0.05$*****, $p < 0.01$****).**

$\chi^2\,(2, N = 204)$	p-value	Digital tool wanted for:
14.09	.00087**	Strategy formation & monitoring
2.25	.32428	Project management
8.6	.01356*	Project portfolio management
1.05	.59188	Data collection
6.35	.04184*	We do not want more tools
0.84	.65783	Others

Table 2. **Significance levels** $(p < 0.05$*****, $p < 0.01$******) **from the two sample Z-test for proportions which pairwise compares the indicated areas for which digital tools are wanted. Colors indicate results from the different population categories** < 3000 **(blue),** $3000 - 10000$ **(orange), and** > 10000 **(green).**

Digital tool wanted for:	A1	A2	A3	A4	A5
Strategy formation & monitoring (A1)					
Project management (A2)	*				
Project portfolio management (A3)					
Data collection (A4)	* * **	* **	** *		
Others (A5)	** ** **	** ** **	** ** **	** ** **	

Table 3. **Barnard's exact test on response frequencies according to population size categories for the reasons for rejecting new digital tools** $(p < 0.05$*****, $p < 0.01$****).**

Wald statistic	p-value	Reason for the rejection of new tools:
0.35	.79423	Financial situation
0.77	.46823	Skepticism about benefits
0.37	.79423	Lack of digital skills
-2.61	.00928**	Bad experience with previous tools
-1.70	.10011	Others

Table 4. **Significance levels** $(p < 0.05$*****, $p < 0.01$******) **from the two sample Z-test for proportions which pairwise compares the indicated reasons for rejecting new digital tools. Colors indicate results from the different population categories** < 3000 **(blue) and** ≥ 3000 **(red).**

Digital tool wanted for:	A1	A2	A3	A4	A5
Financial situation (A1)					
Skepticism about benefits (A2)	*				
Lack of digital skills (A3)	*	** **			
Bad experience with previous tools (A4)	**	**			
Others (A5)		**	**	**	