



**University of
Zurich**^{UZH}

**Zurich Open Repository and
Archive**

University of Zurich
University Library
Strickhofstrasse 39
CH-8057 Zurich
www.zora.uzh.ch

Year: 2022

Citizens' expectations about achieving public value and the role of digital technologies: It takes three to tango!

Zavolokina, Liudmila ; Sprenkamp, Kilian ; Schenk, Birgit

Abstract: Governments across the globe are facing pressure to increase the speed of their digital transformation to meet the needs of the digital society while fulfilling their primary task of delivering public value. While researchers agree on the importance of the public sector for public value creation, recently, more and more studies have recognized the criticality of collaboration between the public and private sectors for successful public value creation. In our research, we conduct a qualitative survey. We examine the idea of collaboration between the public and the private sectors in more detail and add the citizens' perspective. We highlight the need for joint forces for optimal public value creation, identify ways to achieve this, and determine what digital technologies can support this process.

Posted at the Zurich Open Repository and Archive, University of Zurich

ZORA URL: <https://doi.org/10.5167/uzh-220890>

Conference or Workshop Item

Published Version

Originally published at:

Zavolokina, Liudmila; Sprenkamp, Kilian; Schenk, Birgit (2022). Citizens' expectations about achieving public value and the role of digital technologies: It takes three to tango! In: 56th Hawaii International Conference on System Sciences, Maui Hawaii Insel, 4 January 2023 - 8 January 2023. s.n., Epub ahead of print.

Citizens' expectations about achieving public value and the role of digital technologies: It takes three to tango!

Liudmila Zavolokina
University of Zurich
zavolokina@ifi.uzh.ch

Kilian Sprenkamp
University of Zurich
kilian.sprenkamp@uzh.ch

Birgit Schenk
University of Applied Sciences
Ludwigsburg
birgit.schenk@hs-ludwigsburg.de

Abstract

Governments across the globe are facing pressure to increase the speed of their digital transformation to meet the needs of the digital society while fulfilling their primary task of delivering public value. While researchers agree on the importance of the public sector for public value creation, recently, more and more studies have recognized the criticality of collaboration between the public and private sectors for successful public value creation. In our research, we conduct a qualitative survey. We examine the idea of collaboration between the public and the private sectors in more detail and add the citizens' perspective. We highlight the need for joint forces for optimal public value creation, identify ways to achieve this, and determine what digital technologies can support this process.

Keywords: eGovernment, public value, citizens, digital government, digital platforms

1. Introduction

Governments worldwide are under pressure to increase their digital transformation to meet the needs of the digital society. While the pandemic posed challenges for both private and public sectors to become more digital and virtually connected, necessitating them to establish more resilient digital infrastructures, the public sector still lags behind the private sector. A recent article from the World Economic Forum (WEF) (Neri, 2022) reports the reasons for the slow digital transformation in the public sector: lack of digital skills, digital capabilities, and outdated technologies and architectures in use. The public sector's slow pace (or even inability) in fostering digital transformation may result in losing sovereignty and citizens' trust. The WEF article highlights the urgent need for public-private

partnerships around technology, culture, and skills to foster digitalization in the public sector, which then benefits society and industry.

Traditionally, governments have the task of creating and delivering public value (PV) to their citizens. While PV and its usefulness as a concept are clear, what constitutes PV in digital government, or eGovernment¹, and how it can be measured and achieved are all critical and (fully or partly) unanswered questions in the ongoing research. Public value theory (Moore, 1995) suggests a useful integrative perspective on PV as the fulfillment of public expectations and goals as opposed to pure service production (Bannister & Connolly, 2014). Prior research has demonstrated that information and communication technologies (ICT) support creating and delivering PV (Maragno et al., 2021; Panagiotopoulos et al., 2019).

While there is an agreement among researchers regarding the importance of the public sector for PV creation, recently, studies have increasingly recognized the need and the criticality of collaboration between the public and private sectors for successful PV creation (Cabral et al., 2019; Panagiotopoulos et al., 2019). This collaboration could even change the role of the public sector to that of an orchestrator in such a collaboration. Our study analyzes the idea of collaboration between the public and the private (i.e., business) sectors and extends it with a citizens' perspective in two ways: 1) we introduce citizens themselves as another stakeholder that might contribute to successful PV creation; 2) we ask citizens their expectations of stakeholders' contributions (public sector, businesses, citizens) to different PVs.

The citizens' perspective is essential since citizens are the primary recipients of created PV. To our best knowledge, none of the prior studies examined the interplay of different stakeholders, citizens included, for PV creation. Thus, we

¹ We use 'digital government' and 'eGovernment' interchangeably.

formulated the following research question: *What are citizens' expectations regarding public value creation through digital technologies?*

To address the research questions, we conducted a quantitative and qualitative survey distributed among citizens in a Western European country. The paper at hand reports on the results from the survey and conceptualizes the idea of an interplay between three major stakeholders, i.e., businesses, citizens, and the public sector, for successful PV creation through digital technologies. This study extends the existing research on PV and ICT and calls for better collaboration between the three crucial societal actors.

The paper is structured as follows. In the next section, *Related Work*, we look at the key aspects of creating PV and how ICT can help. In the *Methodology* section, we describe the methodological approach of our study. We then present our study's *results* and their *validation* using the example of two use cases and *discuss* our contributions to theory and practice. Finally, we draw *conclusions*, describe the study's limitations, and formulate ideas for future work.

2. Background

2.1 Public value(s)

PV is traditionally known as a concept in the context of public sector management. PV differs from private (or business) value: private value is consumed individually by users, and PV is received collectively by citizens (Panagiotopoulos et al., 2019).

Over time, many definitions of PV have emerged. For example, Moore (1995) defines PV as shareholder value in public management. Thus, PV is the managerial process that creates value within the public sector. He measures the success of PV in four dimensions: outcome achievement, trust and legitimacy, service delivery quality, and efficiency. Moore contradicted the general opinion in the 1990s that PV is always generated by the public sector and stated that PV could be generated by all kinds of organizations, including non-governmental organizations and private sector firms. However, Talbot (2011) defines PV as "Public value is what the public values." In this sense, PV is not defined by governments and public or private sector organizations but rather by citizens (Cordella & Bonina, 2012). Citizens attach PV not only to their direct individual benefits but also to visions, aspirations, and ideas about the society they want to live in (like fairness and democracy) (Cordella & Bonina, 2012). However, PV is not restricted to a particular belief system, e.g., religion, constitution,

human rights, democracy, etc., and, therefore, can be defined as "anything people put value to with regard to the public" (Meynhardt, 2009). The impact of PV does not necessarily need to be positive but can be negative (Meynhardt, 2009). Furthermore, it can be argued whether PV is solely limited to citizens as its beneficiary. PV may benefit other stakeholders and thus may serve as a strong incentive for them to contribute to PV creation.

In our study, we adopt this citizen-centric understanding of PV as opposed to the functional view of PV as an outcome of the public sector's tasks. We do not aim to propose a new interpretation of PV or find new PVs; instead, we search for ways to achieve PV in the eyes of citizens. Now, we will turn to the related literature on how ICT contributes to PV.

2.2 ICT for public value

The success of many digital technologies for *private* value creation has been proven across different sectors (Bauer et al., 2019; Gregory et al., 2020; Nielsen & Persson, 2017; Thompson et al., 2005). Typically, the private sector is more proactive in adopting new digital technologies because of competition in the market and the pressure to survive, which is greater than in the public sector, targeting *public* value creation. While ICT has proven to reduce the principal-agent problem and transaction costs in eGovernment, it has been acknowledged that ICT contributes to PV creation as a further output (Cordella & Bonina, 2012). For eGovernment, ICT is a crucial component of PV creation as both an enabler and a carrier of value proposition (Cordella & Iannacci, 2010; Panagiotopoulos et al., 2019). ICT allows the creation and delivery of PV through *high-quality services, trust, and socially desired outcomes*, i.e., peace, public health, or reduced poverty (Kearns, 2004). However, the primary perception is that PV is created through ICT mainly by the public sector and, only to a certain extent, by the private sector or citizens (Cabral et al., 2019; Panagiotopoulos et al., 2019).

The public sector utilizes ICT for transformative purposes (Bannister & Connolly, 2014) or reforms (Cordella & Bonina, 2012), which update the existing technological infrastructure. This idea goes beyond using ICT merely as a tool or resource utilized by politicians and public administrations (Cordella & Bonina, 2012; Danziger & Andersen, 2006) to achieve greater efficiency and save costs. Public sector organizations are redesigned to create PV and serve citizens more efficiently. The academic literature on how ICT contributes to PV from the public sector's perspective is the most extensive. It focuses on a variety of aspects like specific technologies for PV

creation or contexts (e.g., smart city), frameworks for PV measurement, outcomes, and conditions when PV is created (Bannister & Connolly, 2014; Maragno et al., 2021; Neuron et al., 2019; Panagiotopoulos et al., 2019). The recent studies also report on a so-called ‘platformization’ of governments for more efficiency and citizen-centricity, known as ‘government-as-a-platform’ (Cordella & Paletti, 2019; Kuhn & Balta, 2020; Zaramenskikh & Lyubarskaya, 2018).

The private sector primarily contributes to PV with the development and use of ICT by leading innovation. Recently, there has been a shift from closed to open innovation in the private sector (Chesbrough, 2006), allowing ICT to spread faster. However, private sector firms optimize primarily for shareholder value and not for PV, even if this method is currently being questioned (Weigl et al., 2022). Yet, modern challenges (e.g., the emergence of digital identities and the need for a radical change in how society manages natural resources) require new joint approaches (Rieger et al., 2022; Weigl et al., 2022). Still, eGovernment can leverage private sector innovation, enabling outside-in transformations (Klievink et al., 2016).

Citizens can create PV by using eGovernment services (Bannister, 2007), i.e., eParticipation (Rose et al., 2018), or different services actively helping the government, e.g., in waste removal (*TakaCycle*, 2022). Yet, the usage and success of these services are highly dependent on factors like performance expectancy, social influence, or trust (Gupta et al., 2016). While the ability of citizens to generate PV through ICT is limited, they have an essential role in communicating their needs and the early validation of the created digital services for the creation of PV. For this, more user-centric approaches in designing digital services for citizens are helpful. Nevertheless, governments must be conscious of potential clashes between PV and certain user-centricity dimensions (for example, more personalization versus privacy) (Weigl et al., 2022).

While each of these stakeholders (public sector, private sector, citizens) has to a certain extent, the ability to contribute to PV, the prevailing perception is that ICT in eGovernment usually ends in disaster (Kearns, 2004). This negative result could be mitigated through a dedicated framework that gives each stakeholder a better understanding of *how* to create PV jointly, incorporating the use of ICT.

3. Methodology

We followed the qualitative survey method, commonly used in the social sciences (Braun et al., 2021) and recognized by information systems

researchers. The method is especially appropriate when researchers seek to understand participants’ experiences, views, and practices. The qualitative survey method combines the advantages of qualitative interviews (like in-depth and rich insights) and quantitative surveys (like access to a larger number of participants). We selected this method because of its key advantages of openness and flexibility, which are needed in our case to study citizens’ perceptions of PV and its creation. We did not want to rely on prior PV frameworks, which focus on understanding PV from the public sector’s perspective or limit citizens’ understanding of how PV can be achieved. First, we identify citizens’ expectations towards businesses, the public sector, and themselves in how they should contribute to different PVs. Then, we identify and map different digital technologies that may help contribute to the PVs according to the participants’ expectations.

3.1 Data collection

The data collection was done in a mixed-method approach. The data was collected in a qualitative survey in Germany, containing 281 qualitative responses from citizens, selected based on convenience sampling (Etikan et al., 2016). The respondents were reached through the students of a course at the university one of the co-authors works at: each student had to propose at least five respondents from their family or friend circle. We believe that selecting citizens as respondents is appropriate for our study and does not threaten its validity since we focus specifically on citizens’ expectations, even if they may be subjective. The questions were formulated in German; however, the concept of ‘public value’ was referred to in English. The questionnaire was pretested first with a group of 56 citizens. The pretest showed that the drop-out rate was high when respondents were directly asked what ‘public value’ means. Therefore, the researchers decided that the responses would be recorded in a short discussion with the respondents and asked whether the term ‘public value’ was known to the respondents. If not, the respondents could ask to translate, explain, or give an example of PV.

This approach allowed us to listen actively, question, probe, and collect richer data (Paradis et al., 2016). The questionnaire contained demographic questions and open-ended questions. The demographic questions covered the respondents’ age, civil status, region and municipality where they lived, IT use, and voluntary engagement. In the open-ended part of the survey, we asked how the public sector, businesses, and citizens can contribute to PV, and the role of digital technologies and solutions in PV

creation (see Table 1 for Q1-Q5 and the number of given responses).

Table 1 Open-ended questions

Questions	No answer	# Answers
Q1. How can citizens contribute to public value?	39	243
Q2. How can the public sector contribute to public value?	47	234
Q3. How can businesses contribute to public value?	73	208
Q4. How can digital technologies or solutions contribute to public value?	92	189
Q5. Which digital technologies or solutions contribute to public value?	77	204

3.2 Data analysis

Altogether, among 281 respondents, 148 women and 133 men answered the questions, 109 respondents were married, and 172 respondents were single/separated/widowed. 94 respondents were living in rural regions, and 87 in urban regions. The number of inhabitants of their municipalities ranged from less than 10.000 (n=133), 10.0001 to 25.000 (n=83), 25.001 to 50.000 (n=39) and up to 100.000 (n=26). When asked about their volunteer involvement, 112 indicated that they were actively involved, e.g., in clubs, and 169 were not active. When asked how they rate their use of digital technologies, 111 answered "all the time," 98 "often," 45 "rarely" and 27 "never." The question concerning the term "public value" was answered with "no answer" 82 times, and 60 respondents simply translated the term into their language but gave no definition. The analysis showed that none of these items significantly affected the answers to the further open-ended questions.

From the 281 obtained responses, we then manually analyzed the answers to the open-ended questions using MS Excel. We clustered each question's responses to the overlaying topic described by the respondents, using thematic analysis techniques (Braun et al., 2021; Braun & Clarke, 2021). For example, if the response indicated PV could be created through 'digital payment methods,' 'digital education,' or 'digital progress,' we clustered this under the keyword of 'digitalization.' If a topic cluster was created in two separate questions, we aggregated those in the next step. After this initial analysis, we found overlap in the clusters (often having identical or

similar clusters) for questions Q1-Q3. Interestingly, no clusters were left without overlap between the stakeholder groups. Consequently, we identified citizens' notions about how individual stakeholders could or should contribute to creating PV.

Finally, we validated our idea of a joint contribution to PV and its benefits by describing two projects, involving all three stakeholder groups, and showing how this interplay between them works in practice and may be mutually beneficial.

4. Results

In this section, we describe the results of our analysis. We report on how different stakeholders contribute to PV creation (subsections 4.1-4.4) and then describe the digital technologies and solutions that contribute to PV (subsection 4.5), as mentioned by the study participants. One main finding is that according to the citizens' expectations for PV, collaboration between the three stakeholders – the public sector (P), businesses (B), and citizens (C)² – is necessary. In some cases, this collaboration is expected for all three stakeholders; in others, it is expected for two stakeholders (e.g., the public sector and businesses). This finding was derived by analyzing the clusters from the survey data bottom-up and not another way around. In other words, we did not predefine the possible ways to contribute to PV but aggregated the qualitative survey responses into clusters and found the overlap in the expectations regarding the stakeholders' contributions to PV. Figure 1 visualizes the intersection between the different stakeholder groups, further described in this section (in 4.1-4.4). Table 2 summarizes our findings regarding the contributions of all three stakeholders and the digital technologies that support these.

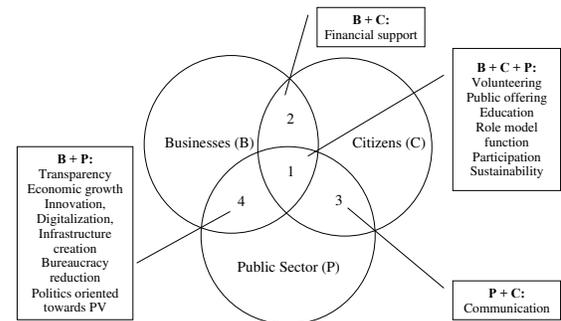


Figure 1 Expected contributions to public value from the public sector, businesses, and citizens

² We shorten the stakeholders to P, B, and C only in the Results section to avoid unnecessary repetition.

4.1 Public sector – Businesses – Citizens

We could see that citizens expect all three stakeholders, P, B, and C, to contribute to PV in six ways. Further, we describe them (marked **bold**) and provide exemplary answers from the survey (translations from German into English are marked *italics*).

PV is expected to be created through **volunteering**. Citizens expect C (in other words, themselves) to engage in *social work, participate in youth work, and commit to working in aid organizations or churches*. P is expected to support volunteering by giving *subsidies* to volunteering organizations, *awarding prizes to people/associations worthy of support*, creating *financial incentives for social projects*, and *investing in social projects*. Similarly, B are expected to promote volunteering through *awards, support of social projects*, and the *release of employees for volunteering commitments*.

Moreover, P, B, and C are expected to contribute to PV through **public offerings**. C is expected to contribute to PV by *using and taking advantage of various public offerings* (like public transportation or public spaces), *attending information events*, or *engaging in citizen participation measures, and workshops*. P may broaden their *public offerings for more public engagement* (like *organizing events*) and provision of inclusive public offerings (e.g., for *different ages*). In turn, B are expected to provide *financial support to their commune* and *cooperate with municipalities and the public sector* (e.g., benefitting from a better reach to their potential clients).

PV is expected to be created through **education**. C are expected to *obtain education* and offer *educational assistance* to those who may need it. P is expected to *provide educational activities of high quality, promote education*, and *offer help for parents and guardians*. B are expected to *train their employees*.

All three stakeholders are expected to contribute to PV by **being role models**. C expect themselves to be an example to others. P is expected to *integrate a focus on PV into their goals and visions, set values, openly discuss them, and be an example*. B are expected to *lead by example, stand up for public values, keep an eye on ethical goals in addition to profit maximization*, and *'infect' the population with public values*.

Participation is another way to contribute to PV. C are expected to actively participate in community life and projects. P is expected to offer opportunities for citizens' participation and empower and involve citizens in the decision-making. B are expected to increase awareness about the possibilities of

participation and run surveys to sense the citizens' opinions better.

Finally, all three stakeholders are expected to contribute to PV through **sustainability**. C are expected to *reduce waste, collect waste, and commit to nature protection*. P is expected to *support garbage disposal actively*. B are expected to *use renewable energy, establish climate-friendly production, optimize waste disposal, and protect the environment*.

4.2 Businesses – Citizens

At the intersection of B and C, only one way to contribute to PV was identified: **financial support**. C expect themselves to contribute to PV by *paying taxes and donating*. Similarly, B's contributions mention *donations, investing, and sponsoring of non-profit organizations, associations, and events*.

4.3 Public sector – Citizens

The expected contributions of P and C were mentioned under the cluster **communication**. C expect themselves to *communicate their ideas, and needs, make suggestions to their communes and municipalities*, attend the consultation hours at their communes, and contribute their opinions to surveys. P is expected to *foster bilateral communication with their citizens, communicate ways of citizen participation, offer consultation hours, and organize information events*.

4.4 Public sector – Businesses

Finally, five ways to contribute were identified regarding the expected contributions of P and B. P and B are expected to contribute to PV through fostering **transparency**. P is expected to make local politics transparent, foster transparency of processes and decisions of public administrations, enhance the quality of public relations work on various channels, and provide reporting. B are expected to be more open and transparent themselves.

Economic growth is another expected way of contributing to PV by P and B. P is expected to contribute by *securing and managing the resources, investing in value-adding projects and facilities, and reducing trade taxes*. B is expected to contribute to the economic growth indirectly through *increasing their profitability, creating workplaces, and achieving high economic output*.

Through **innovation, digitalization, and infrastructure creation**, PV is expected to be achieved in the following way. P is expected to

contribute by *enhancing the level of digitalization of public services* and providing digital infrastructures, while B is expected to *foster innovation, create new products and technologies, and implement new ideas*.

P and B are expected to contribute to PV through **bureaucracy reduction**. P is expected to create *incentives for bureaucracy reduction and address bureaucratic barriers*. B is expected to *adapt customer services and improve their customer orientation accordingly* to minimize bureaucratic procedures.

Finally, to foster PV, P and B are expected to **orient politics towards PV**. P is expected to *sense and focus on the values that are important to the citizens* and integrate them into the *local politics*. B are expected to *take responsibility and include societal adverse effects in the price calculation, set long-term PV-oriented objectives, and carry public values into the company*.

4.5 Digital technologies for PV

In this subsection, we describe the digital technologies mentioned mainly by the participants. After aggregating and clustering the survey responses, eleven digital technologies and solutions were identified. While we acknowledge certain differences in the level of abstraction (e.g., eGovernment may be understood more broadly as opposed to home office ICT), we believe that this level of abstraction is useful and appropriate for our study. Furthermore, it is noteworthy that these technologies do not exclude one another – they are rather complementary to each other. For example, a digital service offered on a digital platform may be available via a website and a mobile app. We briefly describe how digital technologies may support one or another way of contributing to PV. Table 2 provides a complete overview.

Digital platforms were mentioned with examples of *media platforms, discussion platforms, educational platforms, and platforms for public offerings*, provided by private or public organizations. Altogether, digital platforms may be used for bringing different groups of people together: for volunteering (those who need help and those who offer help), education (teachers and learners), participation and public offering (public administrations, businesses, and citizens), financial support (those who seek it and those who provide), enabling innovation (by offering APIs for accessing open data), and bureaucracy reduction (by creating a once-only principle for digital public services).

Social media was another important digital solution, frequently mentioned in the survey responses. Different social media like *Twitter, Instagram, and Facebook* may enhance transparency,

participation, and communication between different stakeholder groups. Furthermore, it helps strengthen the image and reputation of individual stakeholders positioning them as role models. Next, **websites** with a broad use (e.g., being a frontend to digital platforms, as previously mentioned) were noted, like *websites of communes and municipalities and informational websites of government services*. **Networks** are a part of a critical and necessary infrastructure mentioned primarily in the context of the provision of the *Internet, higher connection bandwidth, and connectivity in local and remote areas*.

Along with websites, (mobile) **apps** and smartphones like *apps used to access government services, emergency services apps, and WhatsApp* were mentioned to foster participation and communication. Apps can be, similarly to websites, a representation of digital platforms or used when a mobile setting is the most convenient or the only possible.

Given the last few years have been greatly impacted by Covid-19, it is no surprise that **home office ICT** (e.g., with *communication and collaboration technologies* like Zoom or Miro) became popular and are even seen as a contributor to PV creation. Home office ICT mainly supports the workforce in organizations and may help increase volunteering and education (given better accessibility to the offer but also saved workforce time), contributing to sustainability by reducing the need to commute. Under **eGovernment**, various digital public services were mentioned: for example, *online application forms, renewal of identification documents, and online presence of digital administration*. **Online surveys** primarily included citizen surveys to foster participation and communication. Finally, respondents mentioned **GreenTech** (e.g., with digital applications to *incentivize the use of renewable energy or emission-free transportation*) contributing to sustainability and overall economic growth, **MedTech** (e.g., with *digital patient records*) for general digitalization of health-related services, and **Artificial Intelligence (AI)** (e.g., for *speech and image recognition applications and robot intelligence*) with contributions to digital innovation and bureaucracy reduction.

5. Validation

In this section, we validate and describe the idea of the contributions and benefits of all three stakeholders (i.e., the public sector, businesses, and citizens) for successful PV creation on two exemplary projects in Germany that one of this paper's co-authors was involved in and thus, knows well.

Table 2 Overview of contributions to PV by different stakeholders and the use of digital technologies / ICT

	Stakeholders			Public value achieved by	N/A	Digital technologies / ICT											
	B	C	P			Digital platforms	Social Media	Web sites	Networks	Apps	Home office ICT	eGovernment	Green Tech	Online surveys	AI	MedTech	
1	x	x	x	Volunteering Public offering Education Role model function Participation Sustainability		x	x	x	x	x	x		x				
2	x	x		Financial support		x		x		x							
3		x	x	Communication			x	x	x	x	x				x		
4	x		x	Transparency Economic growth Innovation, Digitalization, Infrastructure creation Bureaucracy reduction Politics oriented towards PV	x		x	x	x		x		x			x	x

B - Business, C - Citizens, P - Public Sector

5.1 Example 1 – Use of social-blended learning in a voluntary fire department

The Fire Brigades Act in Germany assigns the municipalities the mandatory task of establishing, equipping, and maintaining an efficient fire department appropriate to local conditions. The special feature of this community-owned, non-profit organization, which serves the common good, is that it is, as a rule, voluntary. For this reason, the municipalities are dependent on recruiting people for the fire departments in the future who not only can make a considerable part of their free time available for training, leadership tasks in the fire department, exercises, and operations but also do their duty during working hours in the event of an emergency. However, it is becoming apparent that the high level of training required at present is a hurdle for those interested in joining voluntary fire departments, possibly leading to a decline in membership. In addition, experience during the Covid-19 pandemic has shown that previous classroom training was not practical. Training sessions had to be postponed, and significant delays in follow-up courses were the result.

A social blended learning concept based on a digital learning platform with AI that combines the advantages of online distance learning and practical on-site exercises and supports the volunteer trainers can meet the requirements for a relieving resilient education and training. Theoretical content can be stored on the learning platform for self-study and reinforcement in virtual learning groups. In addition, digital learning assistants can support learners as sparring partners during exercises, answer questions as experts and provide feedback. The digitized simulation of operational and fire scenarios can also be used to prepare for on-site training, which can then be used as the basis for more in-depth exercises.

Learners (*citizens*) benefit from 24/7 availability, feedback, and anonymous learning support. They also save travel time during the theory phases and can integrate learning more easily into their everyday lives without neglecting their jobs, families, and friends. Firefighting training will also become more attractive as new technologies are incorporated more promptly. *Businesses* that have released their employees for firefighting duties will also benefit, as less working time will be lost to training and further education. The *public sector* and the society benefit because they can continue to maintain volunteer structures for firefighting and therefore, save resources while maintaining safety.

5.2 Example 2 – Integration of citizens into the municipal waste disposal system

The cleanliness of public spaces and waste management are municipal tasks in Baden-Württemberg, Germany. Thus, all municipalities have an administrative or outsourced organizational unit that takes care of this.

Keeping public places, forests, and parks clean is very resource-intensive. Therefore, municipalities are looking for ways to reduce the burden. One is to involve citizens voluntarily and integrate the business community. In the city of Herrenberg, this has led to a collaboration with citizens who, during their walks and hikes in and around the city, look out for and report larger accumulations of waste but also pick up individual discarded plastic cups, beverage cans, bottles, etc. and put them in garbage bags. At the end of the walk, the garbage bags are deposited in a random location and reported where they are. To make it as easy as possible for volunteers, reporting all garbage spots is done through an on-demand service app. Using their phones, they take photos and send their geocoordinates to report the locations and the type of garbage directly to city officials. With the incoming garbage report, the pickup request is directly integrated into the route planning of the city's garbage collectors. This way, no report is lost, and the pickup is as timely as possible.

Citizens benefit from a clean environment, which is vital for them to feel comfortable. The municipality (i.e., the *public sector*) benefits from the reduced workload, process efficiency, and financial relief due to the possible targeted waste collection. *Businesses* (i.e., the company that developed the app) benefit from the innovative idea of the app, reaching new clients, and expanding their product portfolio.

6. Discussion and conclusions

In our study, we address the following research question: *What are citizens' expectations regarding public value creation through digital technologies?* The results of our study have several theoretical and practical implications.

First, the main answer and the statement backed by the results of our empirical analysis is that citizens can envision contributions towards PV made by the public sector (as the stakeholder traditionally responsible for this task), the private sector, and themselves. This supports the need for collaboration between these stakeholder groups, highlighted in the academic literature (Cabral et al., 2019; Panagiotopoulos et al., 2019) and the professional press (Neri, 2022), and Moore's (1995) original idea

of PV generated not only by the public sector but by all kind of organizations. However, in our study, we identified that it is not only necessary to involve all stakeholder groups, but it can be beneficial to orient them to join forces for activities (like the ones shown in figure 1; it can be also argued whether these actually represent various PVs) to target PV in a specific, potentially beneficial, way for each of them. We described the examples of how it can be done in two use cases. When these benefits are clear, there may be a stronger incentive for them to contribute. For such an orientation, our study suggests several specific ways to achieve PV through stakeholder collaboration. Altogether, such collaboration may result in even 'more' PV where digital technologies help reach scale effect.

Second, our study shows not only the necessity of greater engagement with citizens but also their readiness to contribute to PV in various ways. This finding indicates that user-centric approaches in the design of eGovernment services should not only focus on sensing and responding to the needs of citizens (Weigl et al., 2022) but also on empowering them to contribute to PV and offering them the necessary opportunities. Given that employees in the private sector are also citizens, open innovation programs (Chesbrough, 2006) in private companies may be especially effective and serve the companies' interests and the common good such as PV.

Third, coming to digital technologies, we point to specific technologies that citizens expect the digital government to implement and use for successful PV creation. Notably, citizens refer to well-known concepts like platforms, websites, and apps. This may reflect that many citizens do not necessarily follow the latest technological trends among the population. Still, on the positive side, it may signal the readiness to adopt well-established digital solutions. So, their expectation towards the government hardly lies in the radical digital innovation (which might be the case in the expectation towards businesses, though), but rather the availability and user-friendliness of the services that correspond to their needs and desires and bring various groups together. However, to do that, more openness and co-creation are required. Thus, it calls for further investigation of digital platforms and ecosystems created around them in eGovernment literature (Neuroni et al., 2019). Consequently, this poses the question of what roles different stakeholders may play in these ecosystems and how their interaction can be orchestrated so PV is successfully created. This also highlights the need for more 'platformization' and the 'government-as-a-platform' approach (Cordella & Paletti, 2019; Kuhn & Balta, 2020; Zaramenskikh & Lyubarskaya, 2018). As

opposed to digital platforms run by a private business (which is a sole strong decision-maker), such public-private-citizen ecosystems hardly exist today. However, they can benefit all parties and the overall PV as the intended outcome.

Altogether, our study demonstrates that IT today cannot be used as a tool or merely a resource "in the arsenal of politics-as-usual" (Cordella & Bonina, 2012; Danziger & Andersen, 2006) but enables the three stakeholders jointly create PV through the use of digital technologies may help fight 'politics-as-usual'.

Finally, for practitioners, we also offer a novel perspective. Public administrations and policymakers may need to reconsider their activities and tasks and resource distribution around PV creation. It can mean they might 'outsource' certain functions to other stakeholder groups and assume more of an orchestrating function. As for businesses, they should be aware of the citizens' expectations regarding their role in PV creation. If they do not fulfill it, it can damage their reputation, resulting in losing customers or even failing in the market.

This study is not free of limitations, but these limitations can potentially inspire some future research. First, we acknowledge that to have a comprehensive view of PVs in a specific larger region (e.g., Europe as a whole), such a study would require a comparative analysis of different countries considering their cultural specificities and political structures. Second, our study focused solely on the citizens' perspective. However, we believe future research would benefit from having various perspectives on the PV jointly created. Often, citizens cannot fully know the legal basis on which the public administration operates, or the market situation businesses need to react to. In this way, it would be possible to better understand in what areas it would be realistic for the stakeholder groups to join their forces and in what not. Third, given its focus, our study did not differentiate between PV creation and delivery, even though we are aware of it. In future research, it will be important to address this limitation since it will contribute to more comprehensive understanding of the management of ICT for PV and highlight some differences between these two roles. Yet, we hope our study helps better understand what is necessary for successful PV creation and how it may be realized.

Acknowledgement

We thank the University of Zurich and the Digital Society Initiative for partially financing this study under the DIZH postdoc fellowship of Liudmila Zavolokina, and Michael Arzt for his support in data analysis.

References

- Bannister, F. (2007). The curse of the benchmark: An assessment of the validity and value of e-government comparisons. *International Review of Administrative Sciences*, 73(2), 171–188.
- Bannister, F., & Connolly, R. (2014). ICT, public values and transformative government: A framework and programme for research. *Government Information Quarterly*, 31(1), 119–128.
- Bauer, I., Zavolokina, L., Leisibach, F., & Schwabe, G. (2019). Exploring blockchain value creation: The case of the car ecosystem. *Proceedings of the 52nd Hawaii International Conference on System Sciences*.
- Braun, V., & Clarke, V. (2021). *Thematic Analysis: A Practical Guide*. SAGE Publications Ltd.
- Braun, V., Clarke, V., Boulton, E., Davey, L., & McEvoy, C. (2021). The online survey as a qualitative research tool. *International Journal of Social Research Methodology*, 24(6), 641–654.
- Cabral, S., Mahoney, J. T., McGahan, A. M., & Potoski, M. (2019). Value creation and value appropriation in public and nonprofit organizations. *Strategic Management Journal*, 40(4), 465–475.
- Chesbrough, H. W. (2006). The era of open innovation. *MIT Sloan Management Review*, 127(3), 34–41.
- Cordella, A., & Bonina, C. M. (2012). A public value perspective for ICT enabled public sector reforms: A theoretical reflection. *Government Information Quarterly*, 29(4), 512–520.
- Cordella, A., & Iannacci, F. (2010). Information systems in the public sector: The e-Government enactment framework. *Journal of Strategic Information Systems*.
- Cordella, A., & Paletti, A. (2019). Government as a platform, orchestration, and public value creation: The Italian case. *Government Information Quarterly*.
- Danziger, J. N., & Andersen, K. V. (2006). The impacts of information technology on public administration: An analysis of empirical research from the “golden age” of transformation. *International Journal of Public Administration*.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4.
- Gregory, P., Strode, D., Barroca, L., Sharp, H., & Taylor, K. (2020). Stakeholder perceptions of it business value in a public sector it digitalisation project. *Proceedings of the 28th European Conference on Information Systems*.
- Gupta, K. P., Singh, S., & Bhaskar, P. (2016). Citizen adoption of e-government: A literature review and conceptual framework. *Electronic Government, an International Journal*, 12(2), 160–185.
- Kearns, I. (2004). *Public value and e-government*.
- Klievink, B., Bharosa, N., & Tan, Y.-H. (2016). The collaborative realization of public values and business goals: Governance and infrastructure of public–private information platforms. *Government Information Quarterly*, 33(1), 67–79.
- Kuhn, P., & Balta, D. (2020). Service quality through government proactivity: The concept of non-interaction. In *Electronic Government. 19th IFIP WG 8.5 International Conference, EGOV 2020, Linköping, Sweden*, Springer International Publishing.
- Maragno, G., Gastaldi, L., & Corso, M. (2021). e-Government for public values creation: A systematic literature review. *Proceedings of the 22nd Annual International Conference on Digital Government Research*. Association for Computing Machinery.
- Meynhardt, T. (2009). Public Value Inside: What is Public Value Creation? *International Journal of Public Administration*, 32(3–4), 192–219.
- Moore, M. H. (1995). *Creating Public Value: Strategic Management in Government*. Harvard University Press.
- Neri, A. (2022). *Public sector risks losing trust as digital transformation lags*. World Economic Forum. <https://www.weforum.org/agenda/2022/05/the-public-sector-must-accelerate-digital-transformation-or-risk-losing-sovereignty-and-trust/>
- Neuroni, A. C., Haller, S., Winden, W. van, Carabias-Hütter, V., & Yildirim, O. (2019). Public value creation in a smart city context: An analysis framework. In *Setting foundations for the creation of public value in smart cities* (pp. 49–76). Springer.
- Nielsen, P. A., & Persson, J. S. (2017). Useful business cases: Value creation in IS projects. *European Journal of Information Systems*, 26(1), 66–83. Scopus.
- Panagiotopoulos, P., Klievink, B., & Cordella, A. (2019). Public value creation in digital government. *Government Information Quarterly*, 36(4), 101421.
- Paradis, E., O’Brien, B., Nimmon, L., Bandiera, G., & Martimianakis, M. A. (2016). Design: Selection of data collection methods. *Journal of Graduate Medical Education*, 8(2), 263–264.
- Rieger, A., Roth, T., Sedlmeir, J., Weigl, L., & Fridgen, G. (2022). Not yet another digital identity. *Nature Human Behaviour*, 6(1), 3–3.
- Rose, J., Flak, L. S., & Sæbø, Ø. (2018). Stakeholder theory for the E-government context: Framing a value-oriented normative core. *Government Information Quarterly*, 35(3), 362–374.
- TakaCycle: Easy Waste Collection For Recycling. - Apps on Google Play.* (2022). <https://play.google.com/store/apps/details?id=inc.taipann.takacycle&hl=en&gl=US>
- Talbot, C. (2011). Paradoxes and prospects of ‘public value.’ *Public Money & Management*, 31(1), 27–34.
- Thompson, D. V., Rust, R. T., & Rhoda, J. (2005). The business value of e-government for small firms. *International Journal of Service Industry Management*, 16(3/4), 385–407.
- Weigl, L., Amard, A., Marxen, H., Roth, T., & Zavolokina, L. (2022). *User-Centricity and Public Values in E-Government: Friend or Foe?* European Conference on Information Systems (ECIS).
- Zaramenskikh, E., & Lyubarskaya, M. (2018). Integration of digital services within the framework of the implementation of “government as a platform” (GaaP) model on the example of a social fund. *Digital Transformation and New Challenges* (pp. 1–10). Springer International Publishing.