

Original article

DOI: 10.17323/1999-5431-2024-0-5-146-162

DRIVERS OF ONLINE TRUST IN COMMUNICATION WITH REGIONAL GOVERNMENT: EVIDENCE FROM ST. PETERSBURG

**Lyudmila Vidiasova^{1*}, Felipe Cronemberger²,
Yury Kabanov³**

¹ Sociological Institute, Federal Center of Theoretical and Applied Sociology,
Russian Academy of Sciences, St. Petersburg, Russia;
eGovernance center, ITMO University, Saint Petersburg, Russia;
49 Kronverksky, 197101 St. Petersburg, Russia;
bershads kayalyudmila@gmail.com; ORCID: 0000-0002-8006-7066

² Center for Technology in Government, University at Albany;
135 Western Avenue, Albany, NY 12222, USA;
fcronemberger@alumni.albany.edu; ORCID: 0000-0003-4821-3200

³ Department of Political Science, Higher School of Economics;
123 Griboedova emb., 190068 St. Petersburg, Russia; kabanov_igud@mail.ru

Abstract. Regional governments commonly use e-government technologies when setting out to deliver value to the public. While the use of technology has become a standard of modern public management, risks and limitations associated with its use, such as lack of trust from constituents, need to be carefully examined in light of city experiences, an endeavor that is still scarcely undertaken in the context of smart city initiatives. This paper examines trust regarding online platform usage in St. Petersburg, Russia. The research questionnaire was based on a set of variables that characterize the experience of using information technologies in different areas and in terms of attitudes towards them. A survey of 800 St. Petersburg residents was conducted (the sampling error does not exceed 4%, the confidence level is 95%) and statistical methods (correlation analysis, multiple regression, principal component analysis) were applied. Findings suggest that online trust is multidimensional and influenced by factors related to positive perceptions of institutions, political efficacy of online initiatives, and satisfactory past experience. The implications of these findings and future directions are presented in the context of the e-government research agenda.

Keywords: Trust, technology enablement, e-government, local governments.

For citation: Vidiasova, L., Cronemberger, F. and Kabanov, Yu. (2024) 'Drivers of on-line trust in communication with regional government: Evidence from St. Petersburg', *Public Administration Issues*, 5, pp. 146–162. (In English). DOI: 10.17323/1999-5431-2024-0-5-146-162.

JEL Classification: D73, D83, C38, C83.

Highlights

- Factors influencing levels of trust in information use through e-government technology in St. Petersburg do not point to a single direction.
- Higher levels of institutional trust increase the perceived trustworthiness of citizens-government relations online.
- Higher levels of online political efficacy are associated with higher levels of online presence of citizens towards government.
- Positive user experience of using C2G tools makes citizens more likely to trust interaction with the government online.
- Multifactor models of trust offer directions on potential leveraging points for building trust in socio-technical systems, but the results suggest that they shall not be used prescriptively.

Introduction

Trust is usually considered to be an important factor of digital government construction, either a desired outcome of digitalization or an enabler of such initiatives (Vidiasova and Kabanov, 2020). Citizens' perceived trustworthiness of the innovations they encounter seems to be crucial for the success of policy efforts, thus, it is both theoretically and practically relevant not only to study citizens' trust towards new technologies but also to examine the factors underlying their perceptions.

Many studies emphasize the complexity, multidimensionality, and dynamics associated with the concept of trust, especially in ICTs (Li et al., 2012). While scholars actively conceptualize trust in various spheres such as e-commerce (McKnight et al., 2002) and e-government and e-participation (Kabanov and Chugunov, 2017), there is still a need for more comprehensive approaches to encompass multiple domains of online communication, particularly in the context of public administration and management, in which main discussions revolve around e-government and digital government technologies (Gil-Garcia et al., 2018).

Providing there is a link between trust in government and the quality of government (Mansoor, 2021), it can be assumed that trust has a positive impact on urban governance and the quality of the urban environment, which are principles of the commonly referred to smart city agenda.

In this paper, we aim to uncover the factors that may determine the levels of citizens' trust towards interacting with government online – the concept we refer to as C2G online trust (Kabanov and Vidiiasova, 2020), which is meant to be an important driver of e-government use. In particular, we test the significance of the predictors usually found in the literature (efficacy, institutional trust, user experience, and others) in the case of a local government in St. Petersburg, Russia.

The city of choice is the second largest city in Russia and demonstrates relatively high levels of IT development, ranking 4th in the Russian rating of smart cities and the 73rd place in the Smart City Index by the Institute for Management Development (IMD). The city authorities are known to be active in implementing smart city governance projects (Vidiiasova and Cronemberger, 2020), including participatory ones (Kabanov and Chugunov, 2017). Our data for analysis come from the public survey conducted in 2020.

The paper is structured as follows. First, a literature review gives context to the study of trust in information technology in the public sector, shedding light on digital government and electronic literature in particular. Second, data collection and research methods are outlined. Third, we present the findings and, in the sequence, discuss them in terms of research contributions. The conclusion highlights the relevance of ongoing research on the topic, outlines the limitations of this study, and proposes future directions.

Literature review

Trust in ICT is a long-standing topic in technology research. From established technology acceptance models (Venkatesh et al., 2016) to its numerous adaptations (Ayyash et al., 2012), research on adoption has examined trust as one of its most concerning constructs across a variety of realms and technological contexts, like e-commerce (Ha and Stoel, 2009), infrastructure (Akbari et al., 2020) or urban mobility, as well as e-government and smart city (Habib et al., 2020).

In public administration and management, trust is also a recurring topic (Gil-Garcia et al., 2018;), often discussed through stakeholder theory lenses (Bryson et al., 2016) or governance arrangements enabling collaboration and information sharing to support technologies' adoption and use (Sayogo et al., 2017). Stakeholders and technology also intersect in studies focusing on citizen involvement and participation in technology policy implementations (Kabanov and Chugunov, 2017).

Trust may impact the development of e-government technologies in many ways, which is intensified and complicated by the “multidimensionality” of the concept (Nulhusna et al., 2017). Research considering trust as an independent variable can address both the direct influence of trust on governments' endeavors or its role as a mediator (Sayogo et al., 2017). For the latter, other factors may enhance trust prior to catalyzing certain positive effects in technology adoption and use (Abu-Shanab, 2014), for instance, previous positive experience (Parent et al., 2005). While several studies have relativized the role of the artifact in en-

hancing levels of trust (Abu-Shanab, 2014), some find that the quality of those as boundary objects may account for effective information sharing and use (Cronemberger et al., 2017). Conversely, research has also found that engagement with e-government technologies and trust may go in opposite directions (Porumbescu, 2017).

In line with the constructs established in technology acceptance models (Wang and Lu, 2010) and e-government research, levels of trust in technology are also affected by external factors, which makes it necessary to consider trust as a dependent variable. The literature offers a variety of variables, including prior knowledge and experience with e-government technologies (Morgeson et al., 2011), perceptions of the risk (Bélanger and Carter, 2008), quality of information being delivered (Lee and Huang, 2014), citizens' value and posture towards the technology and responsiveness (Smith, 2010), willingness to use such technologies, demographic, cultural and geographic determinants (Alshawi and Alalwany, 2009), perceived ease of use (Bélanger and Carter, 2008), levels of personalization (Venkatesh et al., 2016), perceived levels of transparency (Grimmelikhuijsen et al., 2013) and openness (Park and Gil-Garcia, 2022), as well as material availability of resources, such as perceived levels of investment in technological initiatives. Other constructs such as "civic mindedness" and the levels of engagement in social media have also been scrutinized (Mergel, 2013), often in the context of multi-factor analyses (Nam, 2014).

In general, research has been prolific in mapping success factors, while also acknowledging that many context-specific elements may influence the relationship between trust and information technology. Several contributions have been made through citizen-centric approaches, with studies identifying trust divides that may be due to lack of participation and engagement opportunities with e-government technologies or due to different perceptions citizens hold on technology-oriented initiatives (Vidiasova and Cronemberger, 2020). The frameworks used in those research approaches are expected to enrich the body of knowledge by balancing findings that can be excessively contextual or sensitive to individual and social experiences with the information being delivered (Venkatesh et al., 2016).

This balance can also be found in studies that look at the adoption of government technology through the lens of policy and governance (Pérez-Morote et al., 2020), a perspective that does not assume a direct relationship between determinants such as financial investments and positive outcomes in terms of trust. Rather, a more holistic systemic approach has identified feedback loops such as the quality of service experience to circumstantially reinforce or decrease the willingness to use certain technologies (Lee et al., 2011).

The multitude of perspectives, dimensions, and theoretical lenses presented to study trust in technology in citizen-government interactions suggests that the topic is vast. Empirical research has pointed to several directions that are consensual, but at times findings were found to be diverse or contradictory. The inherent contextual nature of the topic should not consider findings to be exhaustive, further justifying empirical studies such as the present one and welcoming similar studies in the future.

Research framework and theoretical propositions

In summary, research on trust in e-government has to deal with two major challenges. First, given the multidimensionality of the concept, one should carefully operationalize the concept under study. Our conceptualization of trust is concentrated not on a particular technology perceived as trustworthy, but rather on the process of online communication with the government. The concept we refer to as C2G online trust can be understood as the perceived trustworthiness of interaction with public authorities on the Internet in general. In some way, such conceptualization simplifies reality, which, as previous models suggest, may involve extra dimensions.

Yet, we argue that it grasps the essentials: whether or not citizens use the technologies provided by the government, heavily depends on their willingness to communicate with the public authorities, in the first place (Kabanov and Vidiasova, 2020). The second challenge pertains to the quest for factors that may influence trust. As shown above, researchers have found many variables that shape the attitude of citizens towards technologies. Our study concentrates on three key factors that were found to be important across various dimensions of ICT usage.

In light of those challenges, we start by considering the level of institutional trust, i.e., trust towards authorities and public institutions, in general. There is a plethora of research on how institutional trust and e-government are connected. On the one hand, e-government use may positively impact trust in government (Song and Lee, 2015). On the other hand, this link may be hypothesized as reversed, when higher trust in government is associated with trust in e-government or e-participation technologies, as well as with the intention to use them (Abu-Shanab, 2014). It is henceforth not easy to establish the direction of causality at once, yet, we assume that *higher levels of institutional trust may increase the perceived trustworthiness of citizens-government relations online (H1)*. When people trust their government in general, they are more likely to trust online communication with the government.

Secondly, another important variable is political efficacy, which is one of the traditional correlates of trust in public policy research (Craig et al., 1990). Political efficacy may be internal, i.e., “beliefs about one’s own competence to understand and to participate effectively in politics” (Craig et al., 1990, p. 290) and external, i.e., “beliefs about the responsiveness of governmental authorities and institutions to citizen demands” (Craig et al., 1990, p. 290).

In some cases, the external efficacy is equated to the perceived government responsiveness, however, unlike the latter, responsiveness is usually related to more specific actions of decision-makers and the evaluation of the government performance under public demands. Many scholars have studied the relationship between institutional trust, perceived responsiveness, types of efficacies and e-government (e-participation), though, again, it is hard to define a one-sided direction of causality (Lee and Huang, 2014). Some scholars argue that political efficacy might have different manifestations online and offline, nonetheless. For instance, Sasaki (2016) has proposed the notion of online political

efficacy (OPE), that is, “one’s perception of how much one can affect politics by using the Internet” (Sasaki, 2016). We therefore hypothesize that *higher levels of online political efficacy are associated with higher levels of online citizens’ trust towards government (H2)*.

Thirdly, another important variable is the experience citizens have with e-government technologies. User experience is usually analyzed in the context of user satisfaction of skillfulness (Irani et al., 2012). In this paper, we treat experience as both the exposure to the relevant Internet resources (namely, e-services and e-complaints), and the subjective perception of this experience as positive. We then hypothesize that *if respondents used the online tools and evaluate this experience as positive, they are more likely to trust the interaction with the government online (H3)*.

C2G online trust in St. Petersburg: Empirical analysis

Case, Methods, and Data. The empirical analysis is based on the survey conducted in St. Petersburg, Russia. The questionnaire was based on a set of variables that characterized the experience of using information technologies in different areas and attitudes towards them.

St. Petersburg is the second largest city in Russia, and demonstrably shows a high level of IT development in the country. It stands at 4th place in the Russian rating of smart cities by the Ministry of Construction and Housing and Communal Services of the Russian Federation and at the 73rd place in the world rating of smart cities developed by IMD. St. Petersburg has a long history of implementing state policy in the area of administration and carrying out administrative reform. Being at the forefront of the introduction of technologies, the city is known to be active in implementing smart city governance projects (Vidiasova and Cronemberger, 2020), including participatory ones (Kabanov and Chugunov, 2017).

Our data for analysis come from the public survey conducted in 2020. The data were collected online via the Anketolog service. The system has an anonymous database of respondents. However, users may register only upon authentication with the passport data. The database consists of more than 230 thousand respondents, 25% of whom actively participate in the polls.

Respondents who met the sampling requirements were sent an invitation to participate in the survey via the platform.

Then they were redirected by the link to the website for filling out the electronic form of the questionnaire. This ensures the representativeness of the sample, which was calculated based on the size of the urban population, gender, and age composition.

The sampling error does not exceed 4%, the confidence level is 95%. A total of 800 respondents took part in the survey: 54% of women and 46% of men. The age structure of the respondents is divided into 5 age groups as follows: 18–30 years old (22%), 31–40 years old (29%), 41–50 years old (29%), 51–64 years old (17%) and 65 years old and older (3%). Most of the respondents are employees / specialists (51%), businessmen, top / middle managers (14%), as well as workers, security guards and drivers (11%).

The questionnaire includes statements about the perceived trustworthiness of various IT services, from e-government and e-health to online education, e-banking, and platform services, as well as other statements reflecting personal experiences of using such services. The Likert scale was used to grade the answer options (1 – strongly disagree, 5 – completely agree). The major method of analysis we used in the paper is correlation analysis and multiple regression (OLS). To construct certain variables out of several questions, we also used the principal component analysis (PCA).

Variables. The dependent variable of this study is C2G online trust, which is operationalized in the survey by the following statement: In general, I trust online communication with the government when I use e-services or file e-complaints. As suggested, the question mainly deals with e-government issues and, to a certain extent, with e-participation when it comes to submitting e-complaints.

Our first independent variable is the level of institutional trust, i.e., trust towards the regional and municipal authorities of St. Petersburg. To measure the level of institutional trust, we have asked respondents to express their levels of agreement with the following statement : In general, I trust the regional and municipal authorities of St. Petersburg.

The second independent variable is intended to measure the level of online political efficacy. Respondents expressed their levels of agreement using Sasaki's approach to OPE, as well as on other statements on political efficacy and responsiveness (Sasaki, 2016) (Table 1). As they appear to be highly correlated, we extracted a single variable (OPE) using the PCA. The single principal component extracted explains about 69 percent of the variance, with all questions having very high loadings on this component.

Table 1

Component Matrix (Unrotated) for Online Political Efficacy (OPE)

Question	Variable Name	Component 1 (OPE)
The Internet helps people like me to be better informed about the activities of public authorities	Awareness	.754
The Internet helps people like me to better understand management decisions of public authorities	Knowledge	.832
As the Internet spreads, people like me have more real opportunities to influence management decisions.	Influence	.853
Due to the Internet, politicians and civil servants are becoming more attentive to the problems of citizens, responsive to the opinions of citizens	Responsiveness	.844
Due to the Internet, public authorities really consider citizens' opinions when making administrative decisions	Real Feedback	.858

Sources: Compiled by the authors (hereinafter unless otherwise noted).

Third, another set of independent variables (Table 2) reflects the experience citizens' report on using government online platforms for e-services and e-complaints (or other address forms). To operationalize this variable, we asked several questions (Table 3), and as the answers correlate strongly with each other, the same PCA method was used to minimize the number of variables and calculate a single experience () that covers about 73% of the variance (Table 3).

Table 2

Component Matrix (Unrotated) for Use Experience (Experience)

Question	Variable Name	Component 1
I actively use the Internet to receive state and municipal services (for example, through the portal of public services)	Active_Gosuslugi	.836
I actively use the Internet to contact authorities (via e-mail, specialized portals, etc.)	Active_Complaints	.825
I rate my experience of receiving state and municipal services via the Internet as a positive / I positively evaluate my experience of receiving state and municipal services via the Internet	Gossuslugi_Exp_Positive	.868
I assess my experience of contacting state and municipal authorities via the Internet as a positive / I positively evaluate my experience of contacting state and municipal authorities via the Internet	Complaints_Positive	.887

As control variables, we first use those that indicate the extent to which citizens use online technologies and whether they consider themselves to be active users of the Internet in general and social media in particular. Secondly, we test for gender and age differences.

The preliminary analysis of the variables was conducted using Pearson's correlation analysis, the results are presented in Table 3. It was not possible to draw any conclusions about causality at this point, other than the fact that C2G online trust is indeed positively and significantly associated with all the independent variables: people with higher levels of online political efficacy, a more active and positive user experience, and higher levels of institutional trust tend to have higher levels of online trust in communications with government. C2G online trust is also positively and significantly (though not very strongly) related to internet use and social media use in particular. At the same time, no significant relationship is found between respondents' gender and age characteristics, although, as expected, senior citizens are less active users of the Internet and social media and women are less active on social media than men.

The independent variables used in this study are often correlated with each other. For instance, higher levels of online political efficacy are associated with higher levels of institutional trust and user experience. Although the correlation

analysis does not assume causality, it may assume the fact that the more people use the services with positive outcomes, the more likely they tend to believe that the authorities can be trusted and that citizen participation is meaningful to them. Although correlation analysis does not confirm the existence of a connection.

Table 3

Correlation Analysis

	C2G Trust	Institutional Trust	OPE	Experience	Active Internet User	Active Social Media User	Gender	Age
C2G Trust		.541**	.737**	.612**	.150**	.170**	-.022	-.043
Institutional Trust	.541**		.553**	.374**	.058	.143**	-.047	-.045
OPE	.737**	.553**		.568**	.186**	.231**	.009	-.025
Experience	.612**	.374**	.568**		.293**	.211**	-.085*	.014
Active Internet User	.150**	.058	.186**	.293**		.335**	.006	-.115**
Active Social Media User	.170**	.143**	.231**	.211**	.335**		-.149**	-.221**
Gender	-.022	-.047	.009	-.085*	.006	-.149**		.003
Age	-.043	-.045	-.025	.014	-.115**	-.221**	.003	

Note: ** – correlation is significant at .001 level.

The next step of our study is the regression analysis, the results of which are presented in Table 4. The model is significant and has a good explanatory power: the adjusted R-square is .617, which means that the model explains about 62 per cent of the variance. Despite the fact that the independent variables correlate, as we showed previously, it does not seem to affect the validity of the model: the variance inflation factor (VIF) shows no multicollinearity problem (VIF is less than 2 in all cases).

Institutional trust, OPE and user experience are all significant and positive predictors of C2G online trust when controlling for level of the Internet and social media use and gender and age characteristics (all control variables are not significant in the model).

The highest coefficient is for OPE, which means that this is the strongest predictor of online trust in government interaction: people who believe that the Internet has a positive impact on their knowledge, awareness and relevance to public policy, as well as on government responsiveness, tend to trust the government more when they communicate online. At the same time, user experience emerged as being important which adds supporting evidence to the hy-

pothesis that active exposure to online tools, as well as positive feelings about this exposure, may prime users to higher trust towards these technologies. Finally, institutional trust appears to matter: if people generally trust the authorities, they are more likely to trust them online as well. Thus, all our three hypotheses have been confirmed.

Table 4

**Regression Analysis
(Dependent Variable – C2G Online Trust)**

Variables	Std. Beta-Coefficients (Significance)	VIF
Institutional Trust	.166 (.000)	1.468
OPE	.495 (.000)	1.892
Experience	.283 (.000)	1.604
Active Internet User	-.030 (.208)	1.216
Active Social Media User	-.025 (.298)	1.248
Gender	.087 (.931)	1.043
Age	-.036 (.110)	1.063
R-Square	.620	–
Adj. R-Square	.617	–
Std. Error	.779	–

Discussion

The *first research hypothesis* was confirmed: higher levels of institutional trust increase the perceived trustworthiness of citizens-government relations online.

The *second hypothesis* was confirmed: people with higher levels of online political efficacy tend to have higher rates of online trust in government communications.

The *third hypothesis* was also confirmed: positive experience of using online tools may prime users to higher trust of interaction with the government online.

In the chapter “Research framework and theoretical propositions” the hypotheses are as follows:

Higher levels of institutional trust may increase the perceived trustworthiness of citizens-government relations online (H1).

Higher levels of online political efficacy are associated with higher levels of online citizens’ trust towards government (H2).

If respondents used the online tools and evaluate this experience as positive, they are more likely to trust the interaction with the government online (H3).

The findings of our research support the theoretical propositions outlined in the literature review and expand the knowledge about trust and ICT on a few

fronts. Results showed that in the context of citizens' experience with government online technologies in St. Petersburg, their perceived trustworthiness of such interactions significantly correlates with the use experience they have had, including both the intensity and positivity of encounters with government portals, which is in line with previous studies (Li et al., 2014). Exchange of positive experiences between residents on common resources (portals, chat rooms, forums, etc.) could create positive reinforcement and increase the likelihood of widespread adoption of e-government technologies. Our findings appear to relativize the role of exposure to social media platforms, a factor that has been outlined as a predictor of trust in e-government efficacy (Porumbescu, 2017). Social and demographic factors also proved to be irrelevant, a result that contrasts with the previous studies (Alshawi and Alalwany, 2009).

These findings likely reiterate the importance of institutional trust and direct trust towards power structures, the third largest significance according to our study. The level of citizen-to-government trust appears to coexist with the level of political efficacy online, reflecting results of previous research (Morgeson et al, 2011; Abu-Shanab, 2014;). This finding suggests that trust in citizen-government relationships could be optimized through strategies that take into account the interrelationships between these factors. Such multidimensionality could benefit from careful examination of what factors are taken into account in the context of ongoing local government policies. That could allow for more calibrated investments in one type of initiatives such as enhancing political efficacy, instead of artifact-centric one, such as solely focusing on C2G online trust. With global trends of a decrease in government confidence and the global pandemic throwing new challenges at governments across many countries, constituents who trust government actions and waves of protest against policy decisions shape a highly fragmented public landscape. These trends suggest that it is important to closely monitor trust ratings for federal, regional and local authorities as a basic measure to improve the quality of urban management and policy receptiveness.

A more nuanced finding points out to perceptions or estimated political effectiveness in the online environment, that could be found in previous research (Vidiasova and Cronemberger, 2020). According to the survey, positive assessments of the potential of the Internet use and the perception that the voice of citizens will be taken into account in policy increase the level of trust in online interaction with government officials. The "being heard" factor echoes a somewhat tacit demand from citizens and suggests that proactive behavior and expectations should also be considered in policy design. That also implies that "civic-mindedness" and engagement with social media should not be considered exclusively in terms of pushing e-governments strategies, in which local governments elicit goals such as smart city development and citizens react to them. Rather, pulling e-government strategies, based on openness (Park and Gil-Garcia, 2021) and transparency (Grimmelikhuijsen et al., 2013), may encourage participation and increase trust in e-government technologies.

Findings generally suggest that the way how we define the public may impact the analysis of citizens' trust in e-government. This should be taken into account

in citizen-centric approaches to research and deployment of solutions for government. More specifically, however, certain segments of the public were found to be more adherent to certain modes of technology use. This perspective suggests that trust should not only be associated with artifacts, but with the underlying process in which the artifacts are embedded and the end goal they serve. Apart from the factors mapped in the literature review, this logic appears to agree with the principles of the technology enactment framework, in which the technology use is shaped by the interplay of structures and actors. On this point, findings resonate to some extent with the research of Morgeson et al. (2011), who distinguish confidence in the adoption of technology from the level of satisfaction, the quality of outcomes associated with the technology, or overarching trust in the institutions embracing these technologies. Nuanced perspectives on multifactor research are important for the careful evaluation of the hypotheses and relativization of linkages between levels of trust in government and the technology being used in the contexts of analysis. Another possibility for the role of structure interactions could be tied to knowledge-building skills and increasing levels of familiarity and trust in future engagement with pertaining technologies, a perspective that has been mapped in previous empirical research on technology engagement (Lee et al., 2011), but has not been extensively discussed in terms of organizational and institutional structures. This “co-evolution” or “emergence” (Luna-Reyes et al., 2005) of states in which technology is used suggests that the multifactor research is confined to snapshots of a dynamic process in which actors and structures warp the space in which technology is used, a phenomenon that circles back to notions of the social materiality of technology use in organizations. In this regard, statistical approaches hint at leverage points in trust-building initiatives aimed at increasing technology adoption, but cannot be prescriptive about the contextual experiences of cities. In the case of St. Petersburg, a city where different perspectives on technology and smart city initiatives have been observed (Vidiasova and Cronemberger, 2020), these leverage points deserve consideration and further scrutiny.

Lastly, there are certain limitations to the analysis. First of all, though the sample is representative of St. Petersburg, the results may depend heavily on the context and cannot be easily extrapolated to other cases. Further research is therefore needed to compare our findings with those of other cities. Secondly, there are certain limitations of statistical analysis, which are to be considered when interpreting the results. The use of the Likert-scale variables may cause complications, as some scholars treat them as ordinal and not suitable for linear regression analysis, even though they are usually analyzed as being interval (Wu and Leung, 2017). Finally, there is a problem of establishing the direction of causality, the challenge that many papers in this field face. This research deals with it empirically, assuming that user experience and prior feedback from the government influence the level of trust at the moment of survey and that institutional trust is something more stable than C2G online trust. At the same time, we admit the link can also go in the other direction, which makes it necessary to further develop a suitable theoretical model and consider other approaches and paradigms.

Conclusion

The findings of the study seem to corroborate the multidimensionality of trust in a socio-technical context, which entails St. Petersburg's evolving experience with e-government technologies. It is generally accepted that trust is fragile and sensitive to several aspects of human relations, passive of being compromised by actions or even incentives to action. In this study, we found that this type of trust is held by various pillars, with factors influencing levels of trust in information technologies on multiple fronts.

This complex view underlines the importance of taking into consideration the institutional nature of the organizations that provide new services, etc., as well as the content they use and the transactional mechanisms in place. Furthermore, the level of use of social media and networks (representing social ties) also provides some indication of the level of trust. The interactions and processes underlying the use of technology, rather than the qualitative definitions or attributes of artifacts, appeared to be particularly important for trust in this research.

Trust in e-government technologies, as examined in this study, is defined as multifunctional, then broader related concepts, such as social capital, shed light on the importance of studying hidden factors in the development of human capital to ensure sustainable social development. In the case of urban governance, this phenomenon can be used to build more competence for the actions of government organizations in the online environment, for highlighting positive experiences and advanced achievements likely helps to strengthen residents' confidence in government. The results obtained will be useful for cities and countries implementing new public digital services, as they take into account the categories of trust to institutions and technologies.

The current study found that, C2G online trust can be fostered by better previous experience, political efficacy and institutional trust. Thus, trust can be fostered through better provision of e-participation and e-government facilities, careful work with feedback to increase efficacy, and building trust in citizen-government relations beyond online domains.

Active dissemination of successful experiences in the field of digital services can also increase the trust and degree of involvement of residents in city life and resolving issues online. In addition, another important indicator that must be monitored quarterly is trust in government institutions and organizations at all levels. Monitoring can be carried out with the help of questionnaires using representative samples at the level of the municipality, the region and also federal structures.

Hence, the article calls for a complex view on e-government (e-participation) policies, which would consider not only the technical aspects (though the issues of user experience are important) but also the impacts of e-governance on trust-building, empowerment, and responsiveness.

Future research should focus on more pillars of social capital, examining its subconstructs as a means of identifying even more underlying factors, some of those not necessarily connected with trust. This calls for a closer examination

of social network structures, both in the context of e-government technologies (for example, the presence of local government in social networks) and, more broadly, interest groups and community voices outside the city hall. These studies, either as extensions of the present one or as empirical investigations of other cities and contexts, may reposition the socio-technical role of trust in social relationships in the processes of economic, global and digital world transformations in cities with a smart city agenda or in cities that are in the process of defining and enabling one.

Acknowledgements: The research was supported by the Russian Science Foundation grant No. 22-18-00461 “Delayed aging or late adulthood or in Russia: how digital development change the position of elderly in the era of COVID-19 and uncertainty” (<https://rscf.ru/project/22-18-00461/>).

REFERENCES

1. Abu-Shanab, E. (2014) ‘Antecedents of trust in e-government services: an empirical test in Jordan’, *Transforming Government: People, Process and Policy*, 8(4), pp. 480–499.
2. Akbari, M., Rezvani, A., Shahriari, E., Zúñiga, M.Á., and Pouladian, H. (2020) ‘Acceptance of 5 G technology: Mediation role of Trust and Concentration’, *Journal of Engineering and Technology Management*, 57, 101585.
3. Alshawi, S., and Alalwany, H. (2009) ‘E-government evaluation: Citizen’s perspective in developing countries’, *Information Technology for Development*, 15(3), pp. 193–208.
4. Ayyash, M. M., Ahmad, K. and Singh, D. (2012) ‘A hybrid information system model for trust in e-government initiative adoption in public sector organisation’, *International Journal of Business Information Systems*, 11(2), pp. 162–179.
5. Bélanger, F. and Carter, L. (2008) ‘Trust and risk in e-government adoption’, *Journal of Strategic Information Systems*, 17(2), pp. 165–176.
6. Bryson, J., Sancino, A., Benington, J. and Sørensen, E. (2016) ‘Towards a multi-actor theory of public value co-creation’, *Public Management Review*, 19 (5), pp. 1–15.
7. Costante, E., Den Hartog, J. and Petkovic, M. (2011) ‘On-line trust perception: What really matters’, in: *2011 1st Workshop on Socio-Technical Aspects in Security and Trust (STAST)*. IEEE, Mila, Italy, pp. 52–59.

8. Craig, S.C., Niemi, R.G. and Silver, G.E. (1990) 'Political efficacy and trust: A report on the NES pilot study items', *Political behavior*, 12(3), pp. 289–314.
9. Cronemberger, F.A. and Sayogo, D.S. (2017) 'Examining boundary objects in inter-organizational information sharing (IIS) success', in: Hinnant, C. et al. (eds.) *Proceedings of the 18th Annual International Conference on Digital Government Research*, pp. 167–176.
10. Gil-Garcia, J.R., Dawes, S.S. and Pardo, T.A. (2018) 'Digital government and public management research: finding the crossroads', *Public Management Review*, 20(5), pp. 633–646.
11. Grimmelikhuijsen, S., Porumbescu, G., Hong, B. and Im, T. (2013) 'The effect of transparency on trust in government: A cross-national comparative experiment', *Public Administration Review*, 73(4), pp. 575–586.
12. Habib, A., Alsmadi, D. and Prybutok, V.R. (2020) 'Factors that determine residents' acceptance of smart city technologies', *Behaviour & Information Technology*, 39(6), pp. 610–623.
13. Ha, S. and Stoel, L. (2009) 'Consumer e-shopping acceptance: Antecedents in a technology acceptance model', *Journal of Business Research*, 62(5), pp. 565–571.
14. Irani, Z., Weerakkody, V., Kamal, M., Mohammed Hindi, N., Osman, I.H., Latef Anouze, A., El-Haddadeh, R., Lee, H., Osmani, M. and Al-Ayoubi, B. (2012) 'An analysis of methodologies utilised in e-government research: A user satisfaction perspective', *Journal of Enterprise Information Management*, 25 (3), pp. 298–313.
15. Kabanov, Y. and Chugunov, A. V. (2017) 'Electronic "pockets of effectiveness": E-governance and institutional change in St. Petersburg, Russia', *Lecture Notes in Computer Science*, 10428, pp. 386–398.
16. Kabanov, Y. and Vidasova, L. (2019) 'C2G online trust, perceived government responsiveness and user experience', *Lecture Notes in Computer Science*, 11685, pp. 57–68.
17. Kenski K. and Stroud N.J. (2006) 'Connections between Internet use and political efficacy, knowledge, and participation', *Journal of Broadcasting & Electronic Media*, 50(2), pp.173–192.
18. Lee, C. and Huang, T.Y. (2014) 'E-government use and citizen empowerment: Examining the effects of online information on political efficacy', *Electronic Journal of e-Government*, 12(1), p. 54.
19. Lee, J., Kim, H. J. and Ahn, M.J. (2011) 'The willingness of e-Government service adoption by business users: The role of offline service quality and trust in technology', *Government Information Quarterly*, 28(2), pp. 222–230.
20. Li, F., Pieńkowski, D., van Moorsel, A. and Smith, C. (2012) 'A holistic framework for trust in online transactions', *International Journal of Management Reviews*, 14(1), pp. 85–103.

21. Li, H. and Liu, Y. (2014) 'Understanding post-adoption behaviors of e-service users in the context of online travel services', *Inf. Manag.*, 51 (8), pp. 1043–1052.
22. Luna-Reyes, L.F., Zhang, J., Gil-García, J.R. and Cresswell, A.M. (2005) 'Information systems development as emergent socio-technical change: a practice approach', *European Journal of Information Systems*, 14(1), pp. 93–105.
23. Mansoor, M. (2021) 'Citizens' trust in government as a function of good governance and government agency's provision of quality information on social media during COVID-19', *Government Information Quarterly*, 38(4), 101597.
24. McKnight, D.H., Choudhury, V. and Kacmar, C. (2002) 'Developing and validating trust measures for e-commerce: An integrative typology', *Information systems research*, 13(3), pp. 334–359.
25. Mergel, I. (2013) 'A framework for interpreting social media interactions in the public sector', *Government Information Quarterly*, 30(4), pp. 327–334.
26. Morgeson, F.V., VanAmburg, D. and Mithas, S. (2011) 'Misplaced Trust? Exploring the Structure of the E-Government-Citizen Trust Relationship', *Journal of Public Administration Research and Theory*, 21(2), pp. 257–283.
27. Nam, T. (2014) 'Determining the type of e-government use', *Government Information Quarterly*, 31(2), pp. 211–220.
28. Nulhusna, R., Indahati, S.P., Nizar, H.A. and Phusavat, K. (2017) 'The relation of e-government quality on public trust and its impact on public participation', *Transforming Government: People, Process and Policy*, 11(3), pp. 393–418.
29. Park, S. and Gil-Garcia, J.R. (2022) 'Open data innovation: Visualizations and process redesign as a way to bridge the transparency-accountability gap', *Government Information Quarterly*, 39(10), 101456.
30. Pérez-Morote, R., Pontones-Rosa, C. and Núñez-Chicharro, M. (2020) 'The effects of e-government evaluation, trust and the digital divide in the levels of e-government use in European countries', *Technological Forecasting and Social Change*, 154, 119973.
31. Porumbescu, G. (2017) 'Linking transparency to trust in government and voice', *American Review of Public Administration*, 47(5), pp. 520–537.
32. Sasaki, F. (2016) 'Online political efficacy (OPE) as a reliable survey measure of political empowerment when using the internet', *Policy & Internet*, 8(2), 197–214. DOI: 10.1002/poi3.114
33. Sayogo, D.S., Gil-Garcia, J.R. and Cronemberger, F.A. (2017) 'The mediating role of trust for inter-organizational information sharing (IIS) success in the public sector' in Hinnant, C. et al. (eds.) *Proceedings of the 18th Annual International Conference on Digital Government Research*, pp. 426–435.
34. Smith, M.L. (2010) 'Building institutional trust through e-government trustworthiness cues', *Information Technology & People*, 23(3), pp. 222–246.

35. Song, C. and Lee, J. (2016) 'Citizens' use of social media in government, perceived transparency, and trust in government', *Public Performance & Management Review*, 39(2), pp. 430–453.
36. Venkatesh, V., Thong, J.Y.L., Chan, F.K.Y. and Hu, P.J.H. (2016) 'Managing citizens' uncertainty in e-government services: the mediating and moderating roles of transparency and trust', *Information Systems Research*, 27(1), pp. 87–111.
37. Vidiasova, L. and Cronemberger, F. (2020) 'Discrepancies in perceptions of smart city initiatives in Saint Petersburg, Russia', *Sustainable Cities and Society*, 59, 102158.
38. Vidiasova, L. and Kabanov, Y. (2020) 'Online trust and ICTs usage: findings from St. Petersburg, Russia', in: Charalabidis, Y. et al. (eds.) *Proceedings of the 13th International Conference on Theory and Practice of Electronic Governance*. Association for Computing Machinery, New York, NY, USA, pp. 847–850.
39. Wang, T. and Lu, Y. (2010) 'Determinants of trust in e-government', in: *International Conference on Computational Intelligence and Software Engineering*, Wuhan, China, pp. 1–4.
40. Wu, H. and Leung, S.O. (2017) 'Can Likert scales be treated as interval scales? – A simulation study', *Journal of Social Service Research*, 43(4), pp. 527–532.

The article was submitted: 04 August 2022;
approved after reviewing: 22 February 2023;
accepted for publication: 25 March 2024.