Digital Government Services Development Vector Assessment: Case of St Petersburg, Russia

Vladislav Belyi[a]

[a] *ITMO University, Kronverkskiy Ave, 49-A, St. Petersburg, 197101, Russia*

Abstract

The article presents the results of two surveys in 2021 on government electronic services. For a detailed analysis of the digital government services structure and features use, polls were conducted among representatives of the St. Petersburg authorities as well as citizens. During the research, the levels of services use were determined, the advantages, disadvantages of the current state of services for users were identified. The interaction social environment between citizens and authorities using the services was analyzed separately. The initial perception and attitudes of citizens in electronic interaction have been determined. Based on the article results, ways of developing services to increase public confidence are proposed. A further research vector aimed at a detailed study of the trust parameters has also been identified.

Keywords

e-government, smart city, political institutions, political governance, citizens' trust.

1. Introduction

The acceleration in digitalization has come from the COVID-19 pandemic, which has limited face-to-face interactions around the world. Currently, the availability of high-tech communications allows the introduction of remote technologies in almost all spheres of life, the pandemic together with isolation contribute to an increase in the demand for digital government services.

At the present stage, digital transformation concepts developers are paying close attention to the question how digitalization projects, which aimed at solving the pandemic problems through the electronic services and e-government, will help states, society, business [1]. They note that e-government solutions are becoming vital as they provide social distancing as well. Key benefits of e-government services include quick adaptation, efficient service and low cost scaling [2].

Despite the most important positive trends in the e-government development, the global pandemic has created many challenges for government, business, public non-governmental organizations as well as the media in the trust sphere. According to the study by the global company Edelman (Trust Barometer), the coronavirus has caused misinformation, influenced the growth of mistrust in politicians, leaders, public institutions around the world [3]. The countries have exacerbated the problems associated with the development on health, education systems, the fight against poverty and climate change, as well as effective measures to counter fake news.

2. Trust in Digital Services: Previous Assessment Attempts

The trust issue is one of the key problems for online services, especially in Russia, where there is an extremely low level of public trust in institutions. Among the 27 countries analyzed by Edelman in the Trust Barometer project, Russia ranks last in the spheres of public confidence in business (34% with an average value of 61%), in trust in NPOs (25% with an average value of 57%), also in last place in terms of trust in the media (29% with an average value of 51%). Moreover, Russia is in the position outsider

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EMAIL: vladislav@itmo.ru
ORCID: 0000-0001-6755-2051

in the trust in the government (34% with an average value of 53%) [4]. The low level of institutional trust largely affects the low level of public trust in electronic government services [5]. A high level of citizens' confidence in the Internet and in the Government as a whole influences positively affect citizens' e-government adoption [6].

Trust is one of the basic conditions for the acceptance and technology use [7]. The authors of recent studies note that today the electronic tools implementation problem for interaction between government and society is associated not only with digital infrastructure level development, population skills, but also with the users motivation, which is connected with trust in technological interaction [8]. So, the social interaction environment between citizens and authorities is formed from general institutional trust as well as trust in specific interaction mechanisms. Most researchers agree that there is a positive relationship between the increase in public confidence in local authorities that support the digital services functioning, also an increase in the levels of efficiency and e-government transparency [9]. Research shows that there is a clear connection between the e-government tools effectiveness and citizens' trust, where the services quality plays an important role [10].

Frequency of positive user experience, service quality and general perceptions of counterparties providing the services themselves can be the key factors for successful use. The empirical multifactor model of cybersocial trust proposed by the researchers includes the parameters trust in services, institutional, platform, information, transaction, communication trust [11].

The environment for using services should not only correspond to a certain public confidence level in the process itself, but also to the parameters that affect the trust itself. Other researchers cite the confidentiality and data security as the primary aspects affecting trust. Note that these aspects receive close attention in the electronic environment, although such attention is not paid to the archival or paper data security [12].

Thus, the interaction between citizens and authorities must be considered based on a systematic approach to the entire communication process because electronic services implementation can positively affect the social interaction environment. The functional digital tools availability for civil servants increases efficiency, transparency in decision-making and management, which in turn increases confidence in the officials' behavior [13]. At the same time, it is possible to consider the trust in Internet communication with authorities as a special trust type only until the algorithms for using Internet services become familiar, understandable, while face-to-face interaction is considered as something unusual, to which a special trust type may arise or distrust.

Since 2018, the eGovernment Center of ITMO University has been conducting surveys related to identifying assessments, determining the perception of the development vector, relevance, advantages, and disadvantages of electronic government services for interaction between government and citizens. In 2020, before the restrictions related to the coronavirus pandemic, a survey was conducted among St. Petersburg residents in order to identify the parameters of digital government services perception of interaction between the government and society, to determine the most relevant services for citizens, to assess the residents experience of use, as well as to identify friendliness environment parameters of interaction between authorities and citizens in electronic format. Then, primary data were obtained in a situation of the social deterioration and the new social threat emergence. In the course of this study, conducted in person on the multifunctional centers for the provision of state and municipal services, it was found that only 14% of the city's population do not use the Internet to interact with the authorities. In this regard, in 2021, an electronic residents survey related to the services perception was conducted and the parameters of the services use by citizens were analyzed in more detail. Also, a survey was conducted of St. Petersburg state power executive bodies employees in order to obtain expert assessments of electronic participation systems implementation. During the survey, were determined the government officials social capital developments indicators.

3. Research methodology

The residents survey was conducted in an online format using the Anketolog.ru system from May to June 2021. The respondents were asked to answer a questionnaire that contained parameters for assessing citizens' awareness of the available electronic mechanisms and channels of interaction with the authorities, determining the relevance, priority of electronic services for interacting with the authorities and receiving state, public, commercial services. A separate block of questions was devoted to which situations of interaction when using the Internet are affected. Also, several questionnaire blocks were drawn up to determine the citizens attitude to the existing mechanisms, their functionality and trust in interaction. Thus, the questionnaire included key parameters that allow assessing the impact of the pandemic on the trust level in the Internet, the frequency of its use depending on the goals, the citizens' assessment of the vector of service development. Note that, in comparison with the 2020 survey, it was found that in 2021 the share of those who do not use the Internet to interact with authorities decreased by half and amounted to only 7% [14].

To determine a representative sample population that makes it possible to assess the characteristics of the general population, that is, the entire population of St. Petersburg (5.38 million residents according to official data as of January 1, 2021), data on the age, sex composition of the population posted on the website of the Office of the Federal Statistics Service for St. Petersburg and the Leningrad Region were used [15]. Representativeness by gender and age was provided by the online panel of the Anketolog.ru system, which includes respondents verified in the system with fixing gender, age, location and other parameters.

As the survey results, questionnaires of 544 respondents were received, which provides a sampling error of 4.2% with a confidence level of 95%. The sample is representative by sex and age for the population of St. Petersburg. After the survey, a database in MS Excel format was obtained, with the help of which simple calculations together with visualization of the received answers were performed. SPSS Statistics was used to perform complex calculations, including correlations.

In April 2021, using the online survey method on a representative sample, a survey of the executive bodies of state power employees was conducted with the support of the Vice-Governor of St. Petersburg S.V. Kazarina. The questionnaires distributions was carried out through the official letters. The respondents filled out the electronic questionnaire on their own. The link to the questionnaires was posted on the resource Anketolog.ru, the questionnaires collection was also carried out on this resource. 354 employees took part in the survey. The sample size is proportional to the representation of the committees in the total headcount. Representatives of 43 departments, committees, inspections and services of St. Petersburg were interviewed. The sample reproduces the structure of the general population in terms of senior managers ratio including their deputies, heads of departments, departments and sectors of the executive body of state power to employees who do not occupy managerial positions. The first respondents were 25%, the second -75%. A random distribution was obtained by gender and age. Among the respondents - 64% of women, 36% of men. The age structure of the respondents was as follows: 18-25 years old - 7%, 26-35 years old - 34%, 36-45 years old - 30%, 46-55 years old - 19%, 56-64 years old - 9%, 65 and older years - 1%. As a result of such sampling, the reliability of the data obtained is 95.4%, the sampling error does not exceed 5%.

At the same time, the statements included in the survey questionnaire make it possible to analyze not only the parameters of assessing citizens' trust in interacting with the authorities through e-government tools, but also to determine the advantages and disadvantages of online interaction tools current state. Special attention in the survey is paid to the parameters for assessing social capital - to what extent, in the government officials opinion, citizens are aimed at positive cooperation, whether they have sufficient knowledge and whether they strive to solve collective problems.

After the survey completion, compliance with the sample positions was checked, then a text report and a database in MS Excel format were received. Using Excel, simple distributions and data visualization were carried out, more complex calculations (analysis of contingency tables) were carried out using the SPSS program.

4. Research results

According to the survey results in 2021, it was found that the most relevant and useful services for citizens are: health and medical services (85%), services of a safe city for assistance in emergency situations and for interaction with district police (79%), as well as services for public transport passengers (73%). The least demanded services (48%) are civic initiatives portals. This distribution of services relevance has not changed compared to the results in 2020 [17], it should only be noted that all services relevance, in particular, healthcare services has grown. Thus, the pandemic has only enhanced the health and safety services relevance for citizens.

During the citizens surveys and government representatives, data was obtained on their experience of using e-government services. The respondents expressed their agreement degree with the statements on a scale from 1 to 5. For the convenience of the analysis, we will take scores 1 and 2 for the meaning "in general, do not agree", scores 4 and 5 for the meaning "in general, I agree",
the value 3 will be considered neutral. The data obtained are presented in tables 1 and 2.

In general, citizens and government officials highlight the positive effects of the current state of online services for interaction between citizens and government bodies. First of all, citizens single out the information function of online tools, which allow them to quickly and better inform citizens about the authorities activities (57%), also allow more objectively identifying the opinions of St. Petersburg residents on issues of interest to the authorities (51%). Then citizens highlight the services ability improve efficiency by improving interaction between departments (37%), responsibilities distribution between departments (33%), as well as by taking into account the citizens opinion (31%). 28% and 27% of respondents agree that e-government tools increase citizens' satisfaction with the decisions they make and increase citizens' confidence in the authorities. A high share of negative answers was obtained when assessing the level of agreement with the negative effects of service implementation: 48% are confident that services do not increase the burden on employees and authorities, 49% are confident that time and administrative costs do not increase due to services, 54% are confident that the services do not complicate the processes of interagency interaction.

Table 1

Level of agreement with statements about the impact of e-government tools in the citizens opinion (data from 2021, E-Governance Center ITMO University, in percent)

In its current state, online tools for interaction between citizens and authorities	Level of agreement*				
	1	2	3	4	5
Allow faster and better informing citizens about the authorities activities	7	11	26	35	22
Allows to more quickly identify the citizens opinion on issues of interest to the authorities	8	9	32	30	21
Increase the efficiency of government bodies by improving the interaction of various departments	12	16	34	24	13
Increase the efficiency of government bodies due to a more competent and clear distribution of responsibilities between different departments	15	16	35	21	12
Increase the efficiency of decisions made by taking into account the citizens opinions	17	15	37	20	11
Increase citizens' satisfaction with decisions taken by the authorities	17	19	37	17	11
Increase citizens' confidence in government	19	18	36	16	11
Increase the burden on civil servants and authorities	24	24	28	15	9
Increase time and administrative costs during making decisions	21	28	31	13	7
Complicate processes of interagency interaction	26	28	31	9	6

Note: * The level of agreement is recorded from 1 to 5, where 1 - strongly disagree, 5 - strongly agree

During the government officials survey results analysis, it should be noted that this group group assess the positive factors of e-government tools much more strongly than the citizens. The obtained average values share is also noticeably lower.

E-government tools ability in the current state to better inform citizens is noted by 82% of respondents, 78% noted a more prompt identification of citizens' opinions. 74% of respondents believe that by improving the interaction of departments, the efficiency of government bodies increases, 64% noted that efficiency is increased due to a clear responsibilities distribution between departments, the same number of respondents agree that the decisions efficiency is increased by taking into account the population opinion. Among the government bodies representatives, there is also a high proportion of those who believe that services do not increase costs (47%) and do not complicate the interagency interaction processes (59%). It is important to note that among the interviewed employees of executive bodies of state power, a significant proportion of those who believe that services increase the burden on civil servants and government bodies (55%). It is extremely important to assess the services to increase citizens' confidence in the authorities - this was noted by 55%.

Table 2

Level of agreement with statements about the impact of e-government tools in the opinion of representatives of the executive bodies of state authorities (data from E-Governance Center ITMO University, in percent)

In their current state, e-participation tools	Level of agreement*				
	1	2	3	4	5
Allow faster and better informing citizens about the activities of government bodies	1	3	14	28	54
Allows to more quickly identify the citizens opinion on issues of interest to the authorities	1	4	17	31	47
Increase the efficiency of government bodies by improving the interaction of various departments	2	6	18	30	44
Increase the efficiency of government bodies due to a more competent and clear distribution of responsibilities between different departments	3	8	25	32	32
Increase the efficiency of decisions made by taking into account the citizens opinions	4	9	23	32	32
Increase the burden on civil servants and authorities	9	15	21	20	35
Increase citizens' confidence in government	4	10	31	28	27
Increase citizens' satisfaction with decisions taken by the authorities	4	11	35	27	23
Increase time and administrative costs during making decisions	23	24	26	14	13
Complicate processes of interagency interaction	32	27	25	8	8

Note: * The level of agreement is recorded from 1 to 5, where 1 - strongly disagree, 5 - strongly agree

The key obstacles to the digital government services implementation now are the low trust level in the main institutions of society and the low level of Internet literacy, positive experience in using services.

In the broadest sense, trust in society can be viewed as the expectation or confidence of individuals that other social actors (both individuals and institutions) behave predictably and according to certain rules, act honestly, with a careful attitude to the interests of the individual.

The people’s ability to work together for the collective purpose in the context of the social capital development has been studied in detail by the sociologist James Coleman. It is the values that are supported by members that determine the ability of each member to work for the group. benefit. As a result, mutual trust arises, which is an important parameter for the well-being of the entire society. The current situation in Russia can be describe as the lack of "social capital", that is, using the term of

sociologist James Coleman, to talk about the citizens inability to work in a single team for a common goal with mutual respect [18]. In this regard, it is especially relevant to study the attitudes of power and society in relation to each other in interaction. This analysis is necessary to assess the possible effective use of services for the e-governance and territories development purpose with the citizens participation.

For a detailed context analysis of social interaction between the authorities and citizens, both polls included parameters for assessing attitudes, the level of knowledge and population attitudes towards the authorities, the problems being solved.

Table 3

Level of agreement with statements on the use of e-government tools in the opinion of citizens (data from E-Governance Center ITMO University, in percent)

People like me for the most part	Level of agreement*				
	1	2	3	4	5
Aimed at constructive dialogue with government authorities	8	10	36	29	17
Try to solve their personal problems, rather than solve the general problems of the municipality (region)	7	14	36	26	18
Have the necessary knowledge about the current situation and key problems of the municipality (region)	10	22	33	23	12
Have the necessary knowledge about the structure of government bodies in the municipality (region) and their activities	8	21	37	24	11
Initially configured negatively towards the authorities	14	20	38	17	12
Offer useful ideas to improve the situation in the municipality (region)	13	17	42	14	14

Note: * The level of agreement is recorded from 1 to 5, where 1 - strongly disagree, 5 - strongly agree

A significant proportion of citizens believe that they are focused on a constructive dialogue with the authorities (36%) and try to solve personal rather than general problems (34%). A similar picture in the priority of answers is observed among representatives of the executive body of state power: 66% of the respondents are sure that citizens more often solve personal problems using e-government tools than the region's problems, 48% of the respondents note citizens focus on constructive interaction. More than a third of the interviewed government officials believe that citizens have the necessary knowledge about the problems of the region and the structure of government bodies. Also, about a third of citizens themselves note the availability of the required knowledge. It is noteworthy that the least popular in this block of surveys for citizens was the statement about their search for useful solutions to existing problems - only 28% of respondents agree with this statement, while among government representatives 43% are confident in the usefulness of the population's ideas for improving the situation. In the previously voiced context of general distrust, the point about the initial negative attitude towards the authorities is highlighted. Only 34% of the surveyed residents believe that they are not negative by default. This percentage practically does not differ among employees of executive bodies of state power (32%).

Table 4
Level of agreement with statements on the use of e-government tools in the opinion of representatives of executive government bodies (data from E-Governance Center ITMO University, in percent)

Citizens using e-government tools are mostly	Level of agreement *				
	1	2	3	4	5
Try to solve their personal problems, rather than solve the general problems of the municipality (region)	6	11	27	32	24
Aimed at constructive dialogue with government authorities	5	13	34	26	22
Offer useful ideas to improve the situation in the municipality (region)	5	12	40	27	16
Have the necessary knowledge about the current situation and key problems of the municipality (region)	7	21	31	24	17
Have the necessary knowledge about the structure of government bodies in the municipality (region) and their activities	9	22	31	21	17
Initially configured negatively towards the authorities	13	19	36	20	12

Note: * The level of agreement is recorded from 1 to 5, where 1 - strongly disagree, 5 - strongly agree

5. Conclusions

The current state of electronic government services is characterized by a positive assessment of the information interaction between the authorities and society. On the one hand, services make it possible to inform citizens faster, better, also to identify public opinion and increase the government effectiveness through transparency, positive interaction and considering population’s opinions. On the other hand, the survey conducted signals a growing burden on government officials, which may be associated with the addition of digital interaction to the existing built-in communication channels. As a result, this significantly increases the administrative burden on staff.

At the same time, today the population has a significant level of negative sentiment towards the authorities, as well as a desire to obtain personal benefits when using services, not use them for the local and larger communities’ benefit. Nevertheless, the ability of services to positively influence the trust level in the authorities was confirmed. The new technology gives a chance to revise the established views of the population by creating a new communication environment and interaction rules. This is confirmed by the high proportion of respondents among citizens and employees of executive bodies of state power who have not decided how services affect the change in the trust level, in addition to those who unambiguously chose the positive impact of services on the formation of a trusting environment.

Further development of services should go through attracting the population to participate in management processes, involving them in proactive budgeting programs and territorial development, as well as developing functionality to solve larger problems of municipalities, districts and regions. This direction of services development will contribute to the formation of control over the government bodies efficiency. In the case of a positive use experience, this will increase the public confidence level in the authorities during interaction.

The service development structure should facilitate the use of the social environment positive elements, as well as strive to functionally limit its negative aspects. In this regard, the most relevant proposals are a complete transition to an interaction in electronic type, in which the main processes will not be duplicated on paper and create an additional burden on the performers. Citizens and government officials both should implement feedback systems for the functional services development in order to optimize the processes. Programs for public participation in the distribution of budgets as well as a decision-making should first acquire a sufficient number of regular participants at the local level through additional information through management companies, administrations of various levels then enlarge. Their goal should be a comprehensive solution to the municipalities and regions problems, by

building the interaction of the most active residents at state sites with the administration's support and control. Such a solution will allow using the services high potential for the solving municipal and regional problems. Ultimately, this can contribute to the digital transformation of municipal authorities in Russia, which directly through electronic services takes into account the opinions of citizens.

Further research will be devoted to identifying the most relevant local problems for citizens that can be resolved using electronic interaction services. In this analysis, should be separately identified services that are not aimed at obtaining services in electronic form, but at solving residents' local problems that require interaction between them and the authorities. The study also needs to analyze how the experience of using initiative budgeting services and a separate services functionality for solving urban problems will contribute to an overall increase in public confidence in the authorities by comparing the trust levels of citizens who regularly and actively use services to solve problems and those who do not use them. It is assumed that as a result of such a comprehensive study, a working model can be created that determines the weight for each group of problems (in the field of transport, improvement, health care, security, etc.) in the overall trust in the authorities. This will make it possible to identify the most pressing issues requiring urgent intervention, the absence of a solution to which will sharply affect the public's confidence in the authorities.

Today, there are a plenty of reasons to believe that confidence in electronic interaction will increase for some time due to the involvement of more and more users. Another reason for increasing is the further acceleration of digital development in the pandemic era and the limitations of face-to-face interaction. Although various psychosocial factors can play a negative role and leave face-to-face interaction more reliable in the residents' minds, electronic services create an opportunity for the authorities to restructure the system of interaction with citizens, make it open, transparent, and more effective. The interaction system created considering the current social interaction environment and negative and positive elements can establish strong trusting ties between the authorities and the inhabitants of the regions.

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7. References

[1] COVID-19: How eGovernment and Trust Services can help citizens and businesses, 2021. URL: https://digital-strategy.ec.europa.eu/en/news/covid-19-how-egovernment-and-trust-services-can-help-citizens-and-businesses

[2] Accelerated digital government COVID-19 brings the next generation of digitization to government, 2021. URL: https://www2.deloitte.com/xe/en/insights/industry/public-sector/government-trends/2021/digital-government-transformation-trends-covid-19.html

[3] 2021 Edelman Trust Barometer, 2021. URL: https://www.edelman.com/trust/2021-trust-barometer

[4] 21st Annual Edelman Trust Barometer, 2021. URL: https://www.edelman.com/sites/g/files/aatuss191/files/2021-03/2021%20Edelman%20Trust%20Barometer.pdf

[5] Vidiasova L., Kabanov Y. Online trust and ICTs usage: Findings from St. Petersburg, Russia, ACM International Conference Proceeding Series (2020) 847–850.

[6] W. Li, The Role of Trust and Risk in Citizens' E-Government Services Adoption: A Perspective of the Extended UTAUT Model. Sustainability 13 (2021). https://doi.org/10.3390/su13147671

[7] B.M. Muir, Trust between humans and machines, and the design of decision aids. International Journal Man-Machine Studies 27 (1987) 527–539.

[8] L. Vidiasova, I. Tensina A Study of the Trust of St. Petersburg Residents in the Use of Information Technology for Interaction with Authorities. International Journal of Open Information Technologies 1 (2020) 42–46. (In Russ., abstr. in Engl.).

[9] S. Kim, J. Lee, E-participation, transparency, and trust in local government. Public Administration Review 72 (6) (2012) 819–828.
[10] S. Nawafleh, The implementation of e-government and the trust of citizens in public sector performance: the mediating role of service quality. International Journal of Public Sector Performance Management 6 (1) (2020) 17–35.
[11] Y. Kabanov, L. Vidiasova, A Multidimensional Model of Cybersocial Trust: Evidence from St. Petersburg, Russia. Communications in Computer and Information Science 1349 (2020) 205–215.
[12] A. Bayaga, M. Kyobe, J. Ophoff and J. Criticism of the role of trust in e-government services. International Journal of Scientific and Technology Research 9 (1) (2020) 1176-1178.
[13] H. Alaaraj, F.W. Ibrahim. The Mediating Effect of Employee’s Trust on E-government and Good Governance in the Public Sector of Developing Countries. International Journal of Learning & Development 4 (3) (2014) 92-103.
[14] V. A. Belyi, P. V. Smirnova, A. V. Chugunov. Implementation of Electronic State Services in the Economic and Demographic Conditions of the COVID-19: Citizens Survey Results in St. Petersburg. International Journal of Open Information Technologies 8 (11) (2020) 97–109.
[15] Population by municipalities of St. Petersburg as of January 1, 2021. URL: https://petrostat.gks.ru/folder/27595
[16] Sociologist's workbook / Under total. ed. and with a foreword. G.V. Osipova. M .: Book House "Librikom" (2009) 212 p.
[17] V.A. Belyi, P.V. Smirnova, A.V. Chugunov. Smart City Services Development: Citizens Survey Results in St. Petersburg. Scientific Service on the Internet: Proceedings XXII. All-Russian Scientific Conference, 2020, pp. 116–128. (In Russ., abstr. in Engl.).
[18] James S. Coleman. Social Capital in the Creation of Human Capital, American Journal of Sociology 94 (1988) 95–120.