Information Technologies in G2C Communications: Cybersocial Trust Survey

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Abstract. This paper presents the results of survey regarding Saint Petersburg citizens' trust in information technologies. The research was conducted on the base of Actor-network theory ideas and Social Construction of Technology (SCOT) approach. 600 respondents participated in the survey (sampling error does not exceed 4%, 95% level of confidence). The research proposed suggests an approach for studying cybersocial trust in the sphere of G2C communications found in e-government development, online services provision, e-participation in city management. The questionnaire contained the parameters for evaluation trust in new technologies used to communicate with government representatives and get public services, to solve urban problems, and to participate in city management. The survey results indicated a high level of Internet usage, as well as an increased level of trust in financial transactions through the Internet. The level of citizens' trust in getting public services online reached 45%, submitting e-applications – 41%, working with e-petitions – 38%, communicating with authorities via social networks – 15%. According to our research results, St. Petersburg citizens consider personal visit to public authorities as a more effective way to solve urban issues (19%), while the percentage of citizens who believe in the effectiveness of the Internet portals remain insignificant (5%).

Keywords: Social trust · Cybersocial trust · Information technology · Modernization · Urban studies

1 Introduction

In recent years, the process of testing and pilot implementation of complex socio-technical systems with the prefix "smart", such as "smart home", "smart city", "smart car", "smart supermarket" and other, has expanded. The elements of artificial intelligence and machine learning are used to varying degrees in these sociotechnical systems and it is assumed that some actions are carried out without the control of a human being. Social relations between people and organizations in the digital world today are subject to a "decoupling" effect, that is, technical mediation. If in interpersonal communications the work of technologies can be personally monitored and quickly

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adjusted, the contribution of technological intermediaries to institutional interactions should not be overlooked.

Recently, it has become obvious that the use of new technologies demands certain transformations of trust in the institution of public communications. In this regard, the definition of the boundaries of the possible penetration of technology into the everyday lives of individuals acquires high importance, and the problematization of cyber-social trust becomes particularly relevant. Cyber-social trust reflects the specifics of people's attitudes to the functioning of complex information systems, including elements of artificial intelligence.

For a long time, the question of proliferation and use of the Internet was understood in technological terms of digital infrastructure readiness, or in terms of the skills and knowledge that people should possess. It seemed that the problem of the "digital divide" was solved rather mechanistically, by increasing the availability of the Internet and teaching citizens how to use it. At the same time, practice shows the inadequacy of such an approach and the need to understand the "digital divide" not only in terms of the ability of citizens, but also in terms of their informed choice, one of the motives of which is trust in technology. Thus, the problem of using/not using technology turns out to be associated with problems of trust in technology, interpersonal trust, and institutional trust in the media, state institutions, business players and other actors.

In this paper we present the results of a survey of Saint Petersburg residents aimed at comparing different aspects/areas of trust as well as finding out where citizens have high and low level of trust in new technologies.

2 State of the Art

The phenomenon of trust is the object of attention in various areas of the humanities. General theoretical approaches to the study of trust were developed in the works of Baier [2], Bachmann [1], Blau [5], Gambetta [18], Giddens [19, 20], Zucker [44], Coleman [13], Kramer [24], Luhmann [29], Misztal [32], Tyler [43], Fukuyama [16], Sztompka [42].

A separate research area is represented by works in which the phenomenon of trust is investigated as a component of social and political consciousness (Belyanin and Zinchenko [3], Bodyul [6], Dankin [14], Lovell [28], Milner [31]). The problem of social and political trust was examined in the studies of Brann [7], Levis and Weigert [27], Parks [33], Seligman [40], and others. The social trust in social and political institutions, based on empirical research data, was examined in the works of Galkin [17], Levada [25], Piskotin [34] and others [10].

Stolle identifies four approaches in the Anglo-American tradition: the concept of generalized trust, the theory of rational trust, the theory of group identity or group-based trust, and the theory of moral accounts trust [41]. The concept of generalized trust comes from the hypothesis that in order to maintain sustainability in society, there must be "an abstract readiness to trust a stranger and a willingness to interact with him". The theory of rational trust considers trust as a process of social interaction, conditioned by the rational expectations of the subjects and focused on maximizing individual benefits, as a product of rational calculation in conditions with little

information. The theory of group identity explains the formation of trust through an awareness of belonging to a common social group, a common sociocultural and value context. The theory of moral accounts in its constructions is based on the so-called moral argument about responsibility and the moral consciousness of the individual as the basic basis of trust.

In addition, other sources can provide with other classifications. In particular, Levi divides all concepts into cognitive and noncognitive [26]. Braun classifies approaches, identifying two dominant models of social trust: a trust model based on the social exchange paradigm and trust model built on the concept of communal trust [8]. Misztal proposes in classifications to take into account and analytically distinguish between the three main dimensions of trust: types of trust, content of trust, motives of trust and sources of trust [32].

A great contribution to the study of the problem of generalized trust in the context of modernization and democratic development was made by Inglehart, Welzel [23] and the World Values Survey project founded by them. Their analysis is based on the assumption of the modernization of society from the materialistic values of survival to the post-materialistic values of self-expression. This value shift, among other things, is associated with the growth of generalized trust, and trust, in turn, favorably affects the growth of democratic values, the development of civil society and social capital. This thinking on the relationship of trust and social capital is also reflected in the concepts of Putnam [36] and Fukuyama [16].

Most authors of the presented approaches converge in understanding trust as the confidence of some people in the actions of others, based on feelings, and not on rational understanding.

However, a fairly extensive theoretical discourse on the issue of trust does not fully cover aspects related to trust in information technologies in modern society. The impact of the Internet on people's behavior is of great interest to researchers. It is worth noting the research by Bimber [4], Grossman [21], Poster [35], Hirst and Harrison [22].

An empirical study of computer technophobia originated in the early 80s. In one of the first works on this topic, psychologist Timothy Jay identified technophobia through: (1) the behavioral component in the form of resistance to computers; (2) the emotional component in the form of fear or anxiety towards computers as complexes of rational and irrational regulators of behavior; (3) cognitive component or negative evaluation of computers. In subsequent works, the method of measuring and analyzing computer technophobia was perfected, while scientists used such synonyms as techno-stress (Brod) [9], cyberphobia (Rice) [38], computer aversion (Meier) [30], computer anxiety (Raub) [37].

The concept of adoption of innovations developed by Rogers [39] and Davis [15] also deserve special attention. Within this framework, rational factors that influence the choice of new technologies by citizens are analyzed. An expanded model of technology adaptation in the context of e-government development was proposed by Carter and Belanger [11]. They have included "trust" in their model as one of the key factors for adopting new technologies. Subsequently, analyzing the problem of adapting public electronic services, Carter and Weerakkody clarified the concept of "trust", dividing it into trust in information and communication technologies and trust in the authorities, who propose using their services in electronic form [12].

In Table 1 we summarized the areas of trust being studied in these scientific papers. The literature review found out that despite heightened attention to the phenomenon of trust, the interpretation of its nature and the factors determining it remains controversial. Trust in the modern world is becoming a structure-forming element in ensuring social communication. To date, most of the developed economic and managerial models are used to assess the effectiveness of the implementation of e-government.

Table 1. Examples of theorists within specific disciplines investigating trust

Aspect of trust	Authors
General theoretical approaches	A. Baier, R. Bachmann, P. Blau, D. Gambetta, A. Gidden, L. Zucker, J. Colema, R. Kramer, N. Luhmann, B. Miszta, T. Tyler, F. Fukuyama, P. Sztompka
Component of social and political consciousness	A.V. Belyanin and V.P. Zinchenko, V.E. Bodyul, D.M. Dankin, D.U. Lovell, B.Z. Milner
Problem of social and political trust	P. Brann, D. Levis and A. Weigert, C. Park, A. Seligman
Social trust in social and political institutions	A.A. Galkin, Yu.A. Levad, M. Piskotin
Problem of generalized trust in the context of modernization and democratic development	R. Inglehart, C. Welzel
Relationship of trust and social capital	R. Putnam and F. Fukuyama
The impact of the Internet on people's behavior	B. Bimber, L. Grossman, M. Poster, M. Hirst and J. Harrison
Adoption of innovations	E. Rogers and F. Davis
Adaptation of innovations in the context of e-government development	L. Carter, F. Belanger, V. Weerakkody

At the same time, there is no methodology for researching social and cultural differences in relation to new technologies that mediate communications in politics, economics, education and health care. The research proposed suggests an approach for studying cybersocial trust in the sphere of G2C communications found in e-government development, online services provision, e-participation in city management.

3 Research Design

3.1 Research Methodology

The study of the dynamics of citizens' attitudes toward new information technologies is advisable to develop along the lines of transformational metatoretizing, taking into account the interrelation of institutional boundaries and network structures mediated by new technologies. The task of the research is supposed to be realized based on the ideas of the Actor-network theory by Latour and the approach of Social Construction of Technology (SCOT).

The Actor-network theory will make it possible to develop an idea of the social reality that is adequate to the modern conditions of society, with an emphasis on its mutual penetration and complementarity.

Proponents of SCOT approach disputes about the linear history of scientific and technological development and the introduction of inventions into the life of a human being. They open a heterogeneous user relationship in the process of rooting innovation. This shows the interpretive flexibility of the technology and the unpredictability of its possible social effects. According to SCOT, despite some expectations as to what effects will be caused by technical innovations, the daily use of technical inventions can lead to unexpected results. Subscribing to the ideas of SCOT allows one to avoid the deterministic interpretation of computerization as a stage of objective progress of technology and to detect the features of the acculturation of new technologies in various institutional fields.

In this study, the phenomenon of trust is conceptually viewed in the institutional context of the political sphere and is expressed in assessing the trust/distrust of citizens in using information technologies to interact with government representatives through electronic petition portals, forms of electronic inquiries, receiving electronic services, e-voting, etc.

In accordance with the purpose of the study, the questions in the questionnaire were compiled in a way to obtain information on following issues:

- Trust in new technologies to communicate with government representatives and get public services;
- Trust in new technologies to solve urban problems;
- Trust in new technologies to participate in city management.

3.2 Data Collection

The conducted research aimed at identifying the level of social trust in new technologies in St. Petersburg. The data was obtained by interviewers during a personal survey of city residents. The surveys were conducted at 6 multifunctional centers (MFC) providing state and municipal services. It is important to mention that MFCs are located in densely populated districts of the city.

To calculate the sample population, data on population size, age and sex composition were used. The data was obtained on the official website of the Office of the Federal Statistical Service for St. Petersburg and the Leningrad Region. Based on the cities' population, the sample size for the survey was determined to be 600 respondents. The sampling error does not exceed 4%, the level of confidence was 95%.

The survey was conducted in November 2018. Six hundred citizens took part in the study which were divided into six age groups: 18–25 years old (15%), 26–35 years old (19%), 36–45 years old (17%), 46–55 years old (18%), 56–65 years old (16%) and over 65 years old (15%). In each age group, the percentage of men to women was calculated 43% men to 57% of women.

Analysis of the respondent's distributions by occupation showed that the majority are specialists (39%), unskilled laborers/guards/drivers (20%) and students (10%). The survey also included businessmen, senior and middle managers (6%), as well as housewives (6%) and the temporarily unemployed (3%).

4 Findings

The research findings reflect the results of the aforementioned survey regarding social trust in information technology.

4.1 Trust in the Use of New Technologies

The results of the survey showed that most of St. Petersburg residents are active Internet users. The majority of respondents noted that they use the Internet every day (42%) or are almost always online (26%). Survey results also demonstrate that most respondents define themselves as rather experienced users of information technologies, but also noted that it is difficult to master new programs on their own (32%). At the same time, 29% of respondents noted that they can easily learn new programs, applications and products.

Taking into account the high percentage of Internet and IT users, the study examined the attitude of citizens to new technologies and their use for solving urban problems and participation in city management.

The results of the survey showed that most of St. Petersburg residents primarily trust to use new technologies when there is a necessity to pay some fees through the Internet (45%) (see Fig. 1).

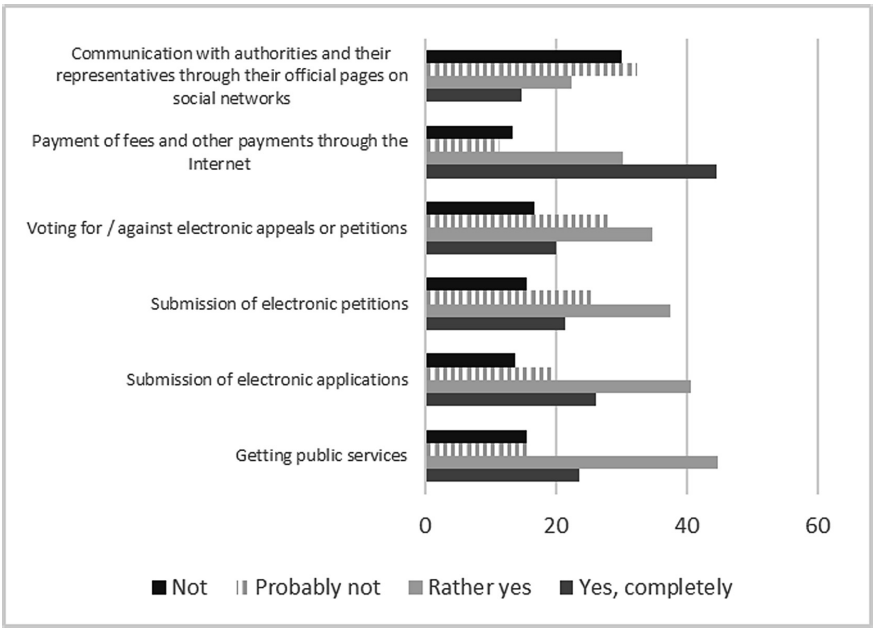

Fig. 1. Distribution of respondent's answers to the question "Do you trust information technology (Internet, mobile applications, etc.) as a tool of communication in these situations?", %

Most of these respondents belonged to "26–35 years" (25%) and "18–25 years" (24%) age groups, while part of respondents who expressed mistrust in this way of payment belonged to "over 65 years old" age group (48%) (see Table 2).

Table 2. Trust in payment of fees and other payments through the Internet by age groups

	Yes, completely	Not	Rather Yes	Rather Not
18–25 years	24%	2%	14%	3%
26–35 years	**25%**	7%	19%	9%
36–45 year	19%	5%	20%	10%
46–55 years	15%	12%	**25%**	20%
56–65 years	11%	25%	13%	22%
over 65 years	6%	**48%**	9%	**36%**

The smallest percentage of respondents indicated that they fully trust new technologies for communication with authorities and their representatives through their official pages on social networks (15%). It is worth noting that residents of St. Petersburg more often expressed their trust in getting public services through the Internet (45%), and submitting electronic applications (41%) and electronic petitions (38%).

The greatest mistrust citizens expressed was in communication with authorities and their representatives through their official pages on social networks (30%). Most of those respondents belong to the "over 65 years old" (29%) and "56–65 years" (21%) age groups. Also, respondents noted that they rather did not trust to vote for/against electronic appeals or petitions (29%).

4.2 Trust in the Use of New Technologies to Solve Urban Problems

The results of the survey demonstrate that the majority of St. Petersburg residents agreed that with the Internet expansion the authorities devote more attention to responding to citizens' requests (become more responsive to citizens, more attentive to problems of citizens) (42%) (see Fig. 2). At the same time, 1/3 of respondents disagreed with this statement (30%). It is important to mention that respondents who tend to trust in attentiveness of authorities to citizen's problem mostly belong to the young age group "26–35 years" (28%). The greatest mistrust was expressed in "65 years +" group (36%).

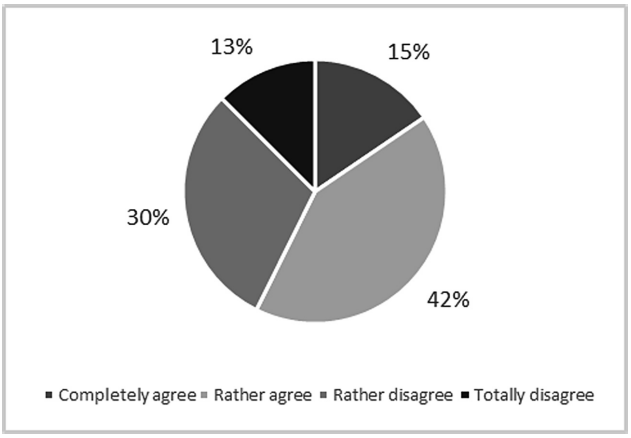

Fig. 2. Distribution of respondent's answers to the question "Do you agree with the statement «As the use of the Internet as a whole expands, the authorities devote more attention to responding to the requests of citizens»?", %

The majority of surveyed St. Petersburg residents noted that the most effective way to solve urban problems in St. Petersburg is reporting problems to the authorities by phone (27%) (see Fig. 3). Citizens consider personal visits to public authorities as a more effective way to solve problems (19%), while the percentage of citizens who trust in the effectiveness of the Internet portals remains insignificant (5%).

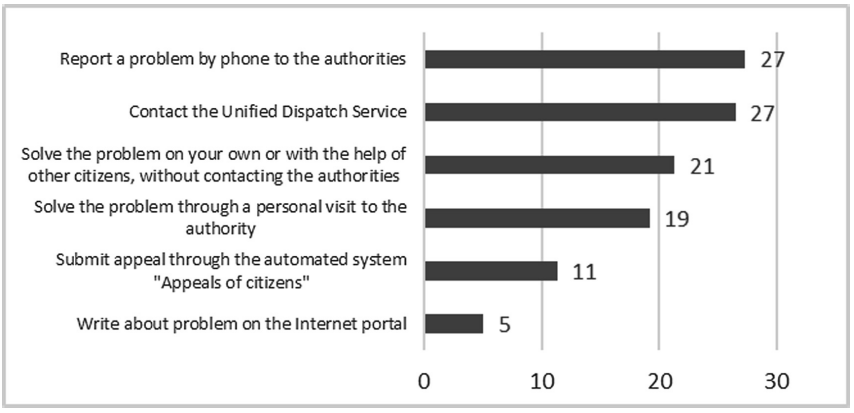

Fig. 3. Distribution of respondent's answers to the question "What is the most effective way to solve urban problems in St. Petersburg?", %

Most of the respondents noted that usually they do not have time to take any actions for solving urban problems that they notice (42%) (see Fig. 4). Most surveyed St. Petersburg residents use a phone for reporting a problem to public authorities (22%). The smallest percentage of respondents use the automated system "Appeals of citizens" (3%) and Internet portals (2%).

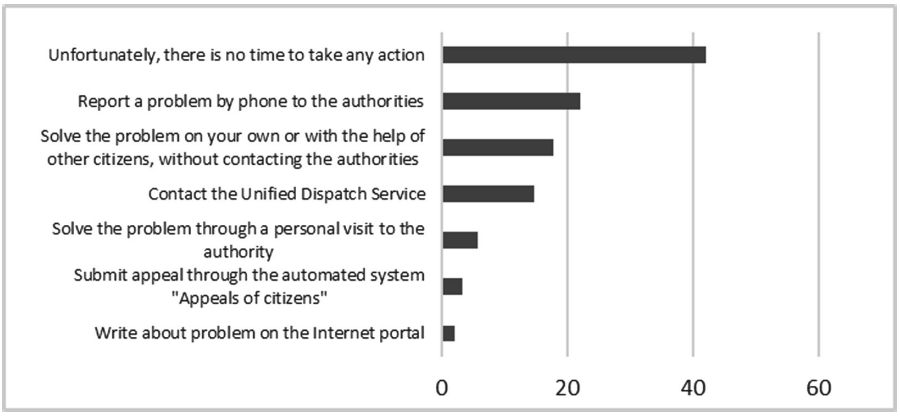

Fig. 4. Distribution of respondent's answers to the question "How do you mostly react to urban problems that you notice?", %

4.3 Trust in the Use of New Technologies to Participate in City Management

The survey results showed that most of respondents had a positive experience in contact with public authorities through electronic receptions (33%) (see Fig. 5). The percentage of respondents who had a negative experience was insignificant (5%). It is important to note that respondents who indicated having any experience all belonged to the same age group "26–35 years". Of these, 27% were satisfied with the use of electronic receptions and 34% were faced with some difficulties. The lack of experience but interest in using an electronic reception was mostly expressed by the respondents of the youngest group "18–25 years" (24%).

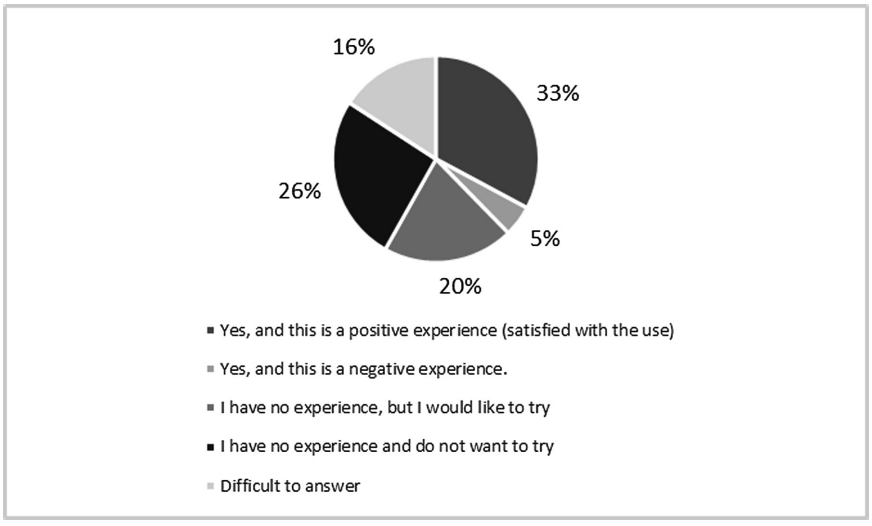

Fig. 5. Distribution of respondent's answers to the question "Do you personally have experience contacting public authorities through electronic receptions?", %

At the same time the percentage of respondents who would not like to try electronic reception to contact with public authorities is higher than the percentage of respondents which were interested to trying (26%). Analysis of this category of respondents showed that the majority of them are non-working pensioners (35%) and belong the "over 65 years" group (29%).

The results of the survey showed that majority of respondents have a positive experience in using public services portals. More than half of respondents are satisfied with the Portal of State and Municipal Services (www.gosuslugi.ru) (54%) as well as have had a positive experience with the Portal of State and Municipal Services of St. Petersburg (www.gu.spb.ru) (38%).

At the same time, St. Petersburg residents did not actively use e-participation portals. The majority of respondents noted that they have never used regional portal "Our St. Petersburg" (https://gorod.gov.spb.ru/) and do not want to try it (45%) (see Fig. 6). Similar results were obtained for portals "Change.org" (https://www.change.org/) (47%) and "Russian Public Initiative" (https://www.roi.ru/) (51%).

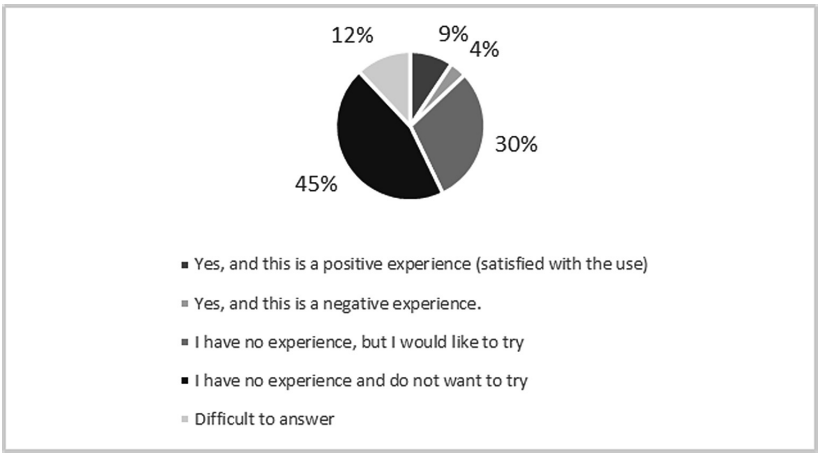

Fig. 6. Distribution of respondent's answers to the question "Do you personally have experience in submitting an appeal on the «Our St. Petersburg portal»?", %

5 Conclusions

The conducted research shed light on the phenomenon of social trust in new technologies usage to communicate with authorities. The study identified markers of trust in certain types of communications with the authorities mediated by Internet technologies. A serious prerequisite for the establishment of social trust in new technologies is a high level of Internet penetration among the residents of the city. Strengthening the use of technology in everyday practices is reflected in a high level of trust in financial transactions on the Internet when paying fees and fines.

The official channels of receiving electronic public services found a high level of endorsement from respondents. However, residents of St. Petersburg trust in communication with representatives of government on the official pages on social networks to a much lesser extent. The survey results showed that most of respondents had a positive experience in contact with public authorities through electronic receptions. At the same time the percentage of respondents who would not like to try electronic reception to contact with public authorities is higher than the percentage of respondents which were interested in trying them.

The results of the survey showed that majority of respondents have a positive experience in using public services portals. However, the respondents rated a telephone call as a more effective way to solve urban issues than web-portals.

The practical value of the study lies in the fact that it attempted to evaluate the use of electronic interaction C2G channels between citizens and the government, as well as to identify potential preferences for using and not using them, and if the respondent did not have experience in accessing them.

The limitations of the study are related to the presentation in the survey of trust as a subjective characteristic felt by the respondents personally. The wording of the questions "Do you trust in different methods of e-communication?" correlates with all-Russian public opinion polls about trust in government institutions and political leaders. Further research should be directed to the definition of a model of social trust for new technologies, including not only indicators of subjective perception, but objectively measured parameters of the manifestation of trust/distrust of communication through the Internet in various fields. Also, the research results could be contextualized with the context of other cities and countries as well.

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