Development of the e-Government in the Context of the 2020 Pandemics

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Abstract. The epidemic caused by the coronavirus COVID-19 influenced the world and had a major economic impact. A sudden and dramatic increase in online activity and necessity to stay at home increased a demand for relevant and reliable information accounting and its fast diffusing. Some of these changes will continue beyond this pandemic. In this article, the author examines the creation, development and implementation in the work of state and municipal institutions of the Government Platform in Russian health care system, including creation of the information platform (COVID-19). Using pandemics as a research context, we have evaluated the role of information and communication technologies (ICTs) in emergency situations which includes technologies to inform, prevention technologies, technologies to engage. This paper focuses on a case study. We made a conclusion about results of implementation the Government Platform in health care system during crises caused by pandemic 2020 through the lenses of technologies implementation. Our results show that largely the information platform (COVID-19) used technologies to inform and prevention technologies, however engaging mechanisms are quite poor.

Keywords: e-Government · Government as a Platform · Orchestration

1 Introduction

In recent times, major technological changes, including the appearance of Internet technologies, brought unique characteristics to the global economic system. The term “digital economy” describes economic and social activities in the context of information and communication technologies, using the Internet and devices (Negroponte 1995). The subject of the research in this work is the ongoing digitalization of public services, as well as the peculiarities of digitalization during the crisis.

According to many scientists, the global world is rapidly entering the era of the digital platform economy, in which the tools and mechanisms used are based on the Internet and online platforms form the foundation of the economic and social life (Kenney and Zysman 2015, 2016; Miller 2020). The main principles of digital platform economy include: the network effect principle, the principle of digital potential, the principle of
infinity and super speed, the value-building principle, the principle of information asymmetry reduction (Johnson et al. 2008; Rozhkova 2017). One of the main characteristics of a digital economy is the high role of the information and knowledge in the production of products and services and the active use of digital methods of storing, processing and transmitting data.

The European Commission also defines online platforms through their functional design as “search engines, social media, e-commerce platforms, online stores, price comparison sites” (The European Commission 2016). Moreover, some companies initially built their enterprise as online platforms (for example, Aliexpress), while others “grew” into platforms thanks to the progressive involvement number of participants, increasing the proposed business opportunities (for example, Facebook).

The idea of a Government as a Platform (GaaP) was put forward by the writer Tim O’Reilly as a formation of an open platform by the state in order to involve various partners in cooperation with authorities (O’Reilly 2011). The concept of Government as a Platform includes an idea that the information produced by and on behalf of citizens is a national asset.

A Government as a Platform concept has been implemented by governments around the world, including USA (Orszag 2011), UK (Brown et al. 2017), Italy (Cordella and Paletti 2019) and Russia (Petrov et al. 2018; Styrin et al. 2019).

Platforms connect providers and consumers of information and services, organizing network interactions, thereby acting as a tool in the public administration system (Janssen and Estevez 2013; Mukhopadhyay et al. 2019), increase overall efficiency of the service production and delivery (O’Reilly 2011; Walravens and Ballon 2013), extend different values associated with public services (Cordella and Bonina 2012; Bannister and Connolly 2014).

Note, however, that the context of all studies is devoted to the “normal” functioning of platforms. However, it remains unclear how these mechanisms can be implemented in the context of crisis component. There is a research gap in understanding of the GaaP main technologies that is used and enhanced during crises.

This research sheds light on the impact that crises have on the creation of GaaP, features of its operation. The global economy faces a variety of challenges: different kinds of crises (economic, social or terrorism) and natural disasters (eruption, flooding or epidemics). The state should respond to any change faster than any other participants of economic activity.

We have chosen the novel coronavirus infection (COVID-19) which became a research context in many investigations (Niyazbekova 2020). From one hand, the main consequence of COVID-19 is a medical impact (a dramatic effect on a health of people), from the other hand – economic one (reductions in income, a rise in unemployment, a bankruptcy of many organizations) (Antipova 2021). COVID-19 have impacted almost all industries. It boosts a further digitalization (Rozhkova et al. 2019). Thus, it is important to use the role of information and communication technologies (ICTs) in emergency situations in order to minimize all negative repercussions.

The paper proceeds as follows. An introduction includes a relevance of the study and a research context. Section 2 reviews a Government as a Platform concept and a main types of crises communications. Section 3 provides a general background of research
and the experience of creating the Government platform in health care system of the
Russian Federation. In Sect. 4 we made an attempt to evaluate results, summarize main
problems and prospects. Summary and conclusions describe main findings and prospects
of future research.

2 Theoretical Framework

Nowadays, technologies’ development plays an important role today in finance (Ross
and Liechtenstein 2018), government auditing (Antipova 2018). Digital platforms
are phenomena which includes enlarging of traditional principal-agent relationships
(Ghazawneh and Henfridsson 2013) and network effects (Belleflamme and Peitz 2018).

A Government as a Platform concept demonstrates all the complexity of large-scale
digital transformation (Evans and Basole 2016). The introduction of digital platforms
requires government agencies to conduct serious legal, organizational, moral and eth-
ic transformation. A lot of resources are required to transform previously created
information systems into state digital platforms.

To digitalize public administration based on a platform approach it is necessary
to carry out organizational and technological changes including fixing and framing to
tackle the variety of barriers (Meijer 2015). When introducing digital technologies into
the public administration system, significant budgetary expenditures are required, which
are difficult to calculate in advance. Moreover, the introduction of technological inno-
vation does not automatically lead to changes in the organizational culture (Oreg and
Goldenberg 2015).

A Government as a Platform concept is a broader instrument than platforms in com-
ercial organizations in terms of functionality and impact on public, industry and market
processes (Jamieson et al. 2020). Government as a Platform forms and digitally regu-
lates industry processes, makes transparent relations between existing industry players
through secure participation technologies, assess mechanism of generating added value
for each participant and the industry as a whole.

A Government as a Platform operates not only within one industry, but also to
organize a cross-industry interaction due to open architectural standards. It requires
more coordination of various authorities, as well as the choice of the operator. The
operator will coordinate relationships between different groups of platform participants,
enhance collaboration and co-creation (Janssen and Estevez 2013).

In the crises context governments can use the role of information and communication
technologies (ICTs) in emergency situations which includes (Asmolov 2016):

1. Technologies to inform. The main aim of such technologies is to provide a gen-
eral information picture of the crisis. The important role of IT in overcoming an
information deficit is obvious (Qayyum 2014).
2. Prevention technologies. They target to transmit information that may be important
to specific users to improve their personal safety, and recommend specific steps to
reduce the level of risk. It includes as well collaboration of different participants
(Brown 2004) and creation of different information to reduce uncertainty, describe
unpredictable environments etc. (McKinney and Yoos 2016).
3. Technologies to engage. They offer users active forms of participation in crisis response through digital mechanisms for mobilizing their resources. The use of this kind of technology is popular at a corporate level through co-creation of value (Bengtsson and Kock 2014; Gnyawali 2016) and quite limited in the context of government (Fuglsang 2008). Nevertheless, government interaction with their citizens will bring more efficient and effective public services (Kokkinakos et al. 2012).

3 Research Setting and Methodology

3.1 General Background of Research

The method that we use is an explanatory case study (Yin 2009). The essence of the case method used in different fields of science is that it gives an idea of a solution or a set of solutions, describes why these decisions were made, how they were introduced, and to what resulted in (Schramm 1971).

The process of conducting a case study includes the stages that are traditional for any scientific research: defining the goal and objectives, collecting, analysing and interpreting the data obtained, preparing a result on the study. The main methods of collecting data during the case study are document analysis, observation, interviewing. Features of the above methods allow us to consider the studied case in broader historical, social, cultural aspects. We sourced data through interviews and documents.

As an object of the research, we have chosen Russian Government Platform in health care system and the information system (platform) for accounting information in order to prevent the spread of a new coronavirus infection (COVID-19). These platforms targeted to form the possibility of quick access to primary health care, increasing high-speed information exchange in medical organizations. Some authors highlighted a need for reconfiguration and optimization of the health care infrastructure in Russia (Antipova and Shikina 2017).

This is one of the most demanded recent projects. Never before state had a program which covers such a huge number of participants, includes mobile application, convenient interfaces for recording on the Internet, SMS notification of an upcoming visit to the doctor, an electronic medical record, an Internet portal for doctors and many other convenient functions of the system. Government Platform in health care system is an important step to create and implement the concept of a Government as a Platform (GaaP) (O’Reilly 2011).

3.2 The Government Platform in Health Care System

In Russian practice, the term “platform” is often utilized as a synonym of an information system. An information system is a system designed to store, search and issue information at the request of users (information service system).

The Unified Government Information System (the Government Platform in health care system) in the health care sector is a national information system which has been created to provide effective information support to government agencies and organizations of the healthcare system, as well as citizens within the framework of the management of medical care. Its development took the first step in 2011 and was completed by 2017.
The principles of building the Unified Government Information System are determined by the specifics of financing medical institutions. Hospitals, clinics and other medical organizations working in the mandatory health insurance system receive the main funding from the budget, which, in turn, consist of insurance premiums deducted by employers. In order to be able to quickly monitor the activities and reporting of health facilities from the centre in order to efficiently spend the funds, it was decided to centralize the IT system. The general architecture of the Unified Government Information System consists of a segment of centralized system-wide components and a segment of applied components.

The first, according to the concept, include subsystems for integrating application systems, maintaining a directory of system users, maintaining a register of reference information, dictionaries of medical terminologies and a register of electronic documents, a subsystem for managing a certification centre, operating management, maintaining e-mail, etc. All components are operated by the Ministry of Health.

The segment of applied components includes transactional (formation of primary information about the activities of medical institutions, automation of information exchange), managerial (integrated electronic medical record), personalized accounting of services provided) and reference (information support of the population, medical staff, students) subsystems.

Applied information systems are subdivided into federal (created by the Ministry of Health) and regional. According to the concept, Russian regions create and operate regional application systems, integrate them with federal application systems and centralized services. Treatment-and-prophylactic institutions report on their own activities to the health authorities with the help of implemented medical information systems. All these innovations in a health care industry improve a medical care safety (Voskanyan et al. 2020, 2021), decrease costs (Somkin et al. 2021) and increase a satisfaction of a population (Buzin 2020).

The global experience of 2020 in the fight against the Covid-19 virus have shown the problem that the states in any moment can face the conditions caused by natural and technogenic factors that may threaten the life of the population for a long time. An important step concerning pandemic was an introduction of the Decree of the Government of the Russian Federation, issued March 31, 2020 No. 373 “On Approval of the Interim Rules for Recording Information to Prevent the Spread of a New Coronavirus Infection (COVID-19)”.

According to this decree, the Ministry of Health of the Russian Federation is the operator of an information system (platform) for accounting information in order to prevent the spread of a new coronavirus infection (COVID-19). Information platform keeps records of information about persons with a confirmed diagnosis of a new coronavirus infection (COVID-19) and hospitalized persons with signs of pneumonia, as well as about persons in contact with patients. Information platform (COVID-19) includes federal and regional segments.

The functions and participants of the information platform (COVID-19) are presented in Fig. 1 (Decree of the Government of the Russian Federation 2020).
The objectives of the information platform (COVID-19) are:

a) collection and recording of up-to-date information about patients and people who has contacted with COVID-patient;

b) organizing the exchange between users the information about patients and contact persons in compliance with the requirements of the legislation of the Russian Federation in the field of personal data.

The Ministry of Health of the Russian Federation (the information platform operator):

a) maintain an information platform (COVID-19) in accordance with the legislation of the Russian Federation on information, information technology and information protection;

b) develop and coordinate federal executive authorities (information providers), regulate the transfer of information in a protected form;

c) develop and communicate to all interested participants instructions and forms according to which information is submitted to an information platform (COVID-19);

d) coordinate the submission of information to the information platform (COVID-19);

e) protect of information contained in the information platform (COVID-19) in accordance with the requirements established by the Federal Security Service of the Russian Federation and the Federal Service for Technical and Export Control;

f) establish requirements and measures to protect the information contained in the information platform (COVID-19);

g) provide an access to the information platform (COVID-19) with the differentiation of the corresponding access rights;

h) provide a methodological support about technical use and content of the information platform (COVID-19).
4 Analysis of the Case

Developing of the information platform (COVID-19) can be divided into 2 different steps. Step 1 includes an implementation of a personalized accounting system for all cases of coronavirus infection (March 2020).

The Russian Ministry of Health has introduced a system of personified registration of all cases of coronavirus infection and pneumonia. In accordance with the Decree of the Government of the Russian Federation No. 373 of March 31, 2020, all medical organizations providing medical care to such patients, the federal executive authorities enter information about them into the information platform. Each of the participants, within the framework of their competence, has the opportunity to use all the information accumulated in the system and necessary to carry out work to prevent the spread of a new coronavirus infection both at the regional and federal levels. Based on the data received from the information system, a report is formed, which is available to federal remote consulting centres for anaesthesiology and resuscitation on the diagnosis and treatment of the new coronavirus infection COVID-19 and pneumonia.

Currently, about 6 thousand employees from almost 1 thousand medical organizations in 84 federal subjects of the Russian Federation enter information into a unified information system for recording patients with COVID-19 and pneumonia, which makes it possible to monitor the situation with the incidence of coronavirus infection COVID-19 and pneumonia in real time, to analyse the spread of COVID-19 throughout the entire territory of the Russian Federation. After the completion of updating the data in the information system and full involvement in the process of entering data on patients of all constituent entities of Russia, the information platform (COVID-19) will become a single source of reliable data on patients with coronavirus infection and pneumonia.

Step 2 includes a creation of information about health workers and students who are entitled to incentive payments for work with coronavirus infection. As well an information about sick doctors has been implemented (June 2020). The information platform (COVID-19) significantly expanded due to information about sick medical workers, as well as the establishment of incentive payments to doctors and students working with patients with coronavirus infection. Now the information platform (COVID-19) contains information about profile patients or those who have been in contact with patients, it is necessary to separately enter information about sick doctors, as well as about students and health workers who are entitled to incentive payments for working with infected people, and about medical organizations in which they are working.

The data of infected health workers must be uploaded to the system within one day of the confirmation of COVID-19. Responsible for this are the regional ministry of health or the institutions of the Federal biomedical agency. The same amount of time is given to a medical organization to inform medical and other workers, including students, about the establishment of “COVID” bonuses from the moment of the beginning of the activity for which they are encouraged.

Compared to the March 2020 (government decree No. 373), the list of departments that have gained access to this information has grown. These are the Compulsory Medical Insurance Fund (including its territorial branches), the Social Insurance Fund, the Rosgvardia, the government apparatus and the presidential administration, the Ministry of Internal Affairs, “other bodies or organizations” that are determined by the federal
operational headquarters. According to experts, in the context of multitasking, a large number of participants, many data transmission channels, the information platform of the Ministry of Health of Russia for monitoring COVID-19 is a tool necessary for making timely and well-grounded management decisions, modelling the situation, and making forecasts for the development of the epidemic process. It is very important that the use of the system can significantly reduce the volume of reporting documents, summaries, notifications that medical organizations, already experiencing a shortage of personnel, are still forced to collect and send to various instances. The data accumulated in the system on the methods of diagnosis and treatment helps to quickly develop and implement in practice the most effective algorithms for the provision of medical care.

We have studied that the information platform (COVID-19) had been built according to the principle of maximum possible unification and integration of functional areas of management (centralized approach). The advantages of information platform (COVID-19) include: the use of uniform requirements, development of interdepartmental interaction, optimization of expenses for information, telecommunication and transport infrastructure, energy and other resources. At the same time, the system is less adaptive to external changes and user requests, require significant costs to ensure the reliability of operation and safety of information resources, as well as compliance with formal procedures for their application. Thus, there is a room for improvements in order to increase the key performance of the public system in general and information platform in particular (Antipova 2017).

Largely the information platform (COVID-19) used technologies to inform. One of the main challenges of the global crisis, the picture of which is changing, is monitoring information and presenting a dynamic, holistic picture of what is happening. This task has become especially difficult because of the number of unverified facts, rumours and misinformation was constantly growing. The information platform (COVID-19) allowed to familiarize with the picture created on the basis of relatively big data in an accessible form.

If we evaluate prevention technologies embedded to the information platform (COVID-19), we can say that the level is quite high. Unlike tools that offer a general picture of events based on an analysis of big data, prevention technologies seek to convey information about risks in the most targeted way. Here the task is to determine what information is directly related to a specific target audience, which, on the basis of this information, should take steps to increase the degree of their personal safety, as well as the safety of those around them. The information platform (COVID-19) has reliable epidemic information and is a base of prevention measures (sending SMS, Telegram-channel etc.). In response to coronavirus, government agencies of Russian Federation quickly began to use messengers as an effective communication channel. In Singapore, there is already a system for receiving information via a smartphone about possible contacts with patients with coronavirus infection. The TraceTogether application allows you to identify everyone with whom the owner of the smartphone was in close contact. Unfortunately, such initiatives are not used in Russia. One of recommendation can be a step to enrich and to enlarge a usage of prevention technologies. For example, state can add additional information about COVID-19 in widely used governmental portal (“gosuslugi”) or based on smartphone applications send all recent news to citizen.
Take notice that the information platform (COVID-19) does not use technologies to engage. Engagement technologies suggest that users have the opportunity to actively participate in the response to a crisis. But due to centralized approach and the vision of government authorities the information platform (COVID-19) does not involve people. The role of technologies to engage is certainly underestimated in Russia. A creation of a collaborative nature through public and private organizations collaboration can boost the process of solutions co-creation (Criado et al. 2020). Further research is clearly needed (interviews, analysis of foreign experience) that will provide an understanding of why the Russian authorities underestimate the potential of technologies to engage, possibilities of co-creation and motivation to implement the idea of Government as a Platform through citizens involvement.

5 Summary and Conclusions

The next challenge for the world community today is the outbreak of coronavirus infection (COVID-19). This virus had an impact not only on the healthcare sector, but also became a trigger for large-scale digitalization, starting the process of adaptation of all spheres of society to the conditions of a new “remote” reality. All this has led to the transformation of the methods and types of interaction between public authorities and citizens, implemented through the integration of an increasing number of state institutions into the digital space. The work of state information platforms is carried out by creating new automated processes for collecting and processing information necessary for the implementation of the powers of state bodies and ensuring the exchange of information between these bodies, as well as for other purposes established by federal laws, as well as increasing the efficiency of information exchange and forecast of its development.

The introduction of restrictive measures in connection with the spread of COVID-19 made it difficult to provide state and municipal services through the physical appeal of citizens to the office of the relevant service. In such circumstances, government platforms have become the key to maintaining the services provided to citizens at the appropriate level. Thus, state information platforms are a necessary component to ensure the stable functioning of state infrastructure in a pandemic.

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