

Digital transformation of public services: leading trends, opportunities, and threats

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Abstract This paper is dealing with digitalization as a driver of improving the effectiveness of the implementation of state functions and services. Digitalization is becoming one of the leading and most effective approaches to increasing the effectiveness and performance.

The paper argues that successful implementation of digital technologies and platform solutions in the public service system might bring many positive outcomes and allow to establish a purpose priority before functions. The novel technologies might also help to develop the “digital mentality” and new competences of civil servants. However, the implementation of the new digital solutions might also bring about negative consequences and treats. Thence, the paper focuses on these threats and scrutinises various “traps” of the digitalization of public services, as well as threats of “riot in cyberspace”, and, last but not least, dangers of “digital totalitarianism” that humankind might face in the nearest future.

1 Introduction

Nowadays, it is becoming clear that digital society has the following key features: non-standard and personalization of products and services, interactive approach; as well as real-time and on-time transactions. All of these features are reflected in practice in the concept of “State as a Platform” also known as “Government as a Platform” or “Government 2.0” (see O'Reilly 2011). The term “Government to citizens” (G2C) is also used. All these describe a new government view based on a common infrastructure of digital systems, technologies and processes with which one can easily create user-oriented public services.

G2C is a modern model of state regulation, which is currently classified as a future. G2C represents a cyber state with a single state digital platform that will unite the existing disparate systems of ministries and departments and digitize all types of interaction between citizens and the state (Linders 2012). With the help of a single digital platform, interaction between government employees, business and citizens will be ensured, and predictive analysis and artificial intelligence will become an assistant to government employees to perform routine operations in sectors from energy to banking (Pagallo 2013; Lisin et al. 2014; or RAENG 2019).

Some experts assume that a part of the solutions at the operational level can be transferred to “intelligent agents” represented by the software systems and algorithms operating on the basis of artificial intelligence (AI) (e.g. Zielińska 2016). They can take over all the routine work, as well as to ensure the implementation of control and supervisory functions. As for more complex tasks requiring political decisions or a “human” approach, they should be handled by specially trained professionals (European Investment Bank 2015). In any case, we might have the AI already, but we are far from having the artificial general intelligence (AGI) that would mimic human emotions and interactions and in general would be self-aware (Castro and New 2016; Strielkowski 2017; Lisin et al. 2018).

In Russian Federation, the idea of “State as Platform” was presented by the experts from the Centre for Strategic Research (CSR) lead by Alexey Kudrin in the report “State as a Platform” in 2018 (CSR 2018). The implementation of the idea provides a transition from existing irrelevant approaches to planning and monitoring the execution of plans (with indicators such as “disbursed funds”, “average wage level”, etc.), to precise “individualized” indicators of the standard of living of citizens and the development of all sectors of the economy. These new indicators might allow to quickly receive feedback from management objects and more accurately work with key development indicators, as well as fix levels of individual responsibility in the management decision-making process. Experts are forecasting that by 2024 the idea will be implemented to some extent: the 50 most sought-after public services will be provided instantly, data from all government information resources will be available in real time via software interfaces. In addition, it is planned to open an Efficiency Management Centre which will be responsible for the digital transformation of all public services processes and evaluate the effectiveness of changes.

The target function of the implementation of the G2C is the well-being of citizens and the promotion of economic growth based on the introduction of technologies, which seems realistic in the near future with the

prompt involvement of ambassadors (ambassadors) on digitalization. In our opinion, governors (majors) and chairmen of regional parliaments, citizens and representatives of NGOs, investors, entrepreneurs and founders of start-ups, heads of intermediary organizations, researchers and scientists should all be involved in some sort of the digital ecosystem.

Designing such a “customer-centric model” of public administration is due to the need to promptly solve the life situations of citizens through various cross-cutting services that are tailored to the needs of the population and do not require data transfer between departments (FabLab Barcelona 2016). The state acts as an IT company that implements a digital platform for the development of “digital twins” (single digital profiles of citizens), a remote biometric single identification system. Therefore, for an effective digital transformation of public administration, it is necessary to go through three main stages of digitalization:

- digitization of processes, in the framework of which the introduction of traditional digital technologies is carried out to increase the efficiency of the activities of government and data management;
- e-government, involving the introduction of digital technologies;
- digital government, in which the latest generation of digital technologies (such as the Internet of things, artificial intelligence, predictive analytics) allow users to take into account the preferences of their services when forming the composition of the services provided.

2 Development of “digital mentality” of civil servants

It is envisaged that in Russia new top-managers dealing with digital transformation will appear in large state corporations in the foreseeable future. Proposals for the mandatory introduction of this position originated in the structures responsible for the implementation of the Digital Economy program. Chief digital transformation managers (Chief Digital Officers) will be responsible for creating digital competence centres in corporations. The head of digital transformation in the understanding of the Ministry of Economic Development is a top manager responsible for training employees, accumulating competences, creating a knowledge management system, digitizing products and services, and creating a package of new digital products and services.

Responsible for the digitization of the government is invited to make a specially created for this ministry of digital transformation, and the process should be coordinated at the highest level - the vice-premier for digital transformation, acting as the chief architect of the system.

Such a unified architecture of the state digital platform will overcome the fragmentation of departmental systems, state services will be converted to electronic form with a system of remote biometric identification. "Intellectual agents" will have to work with "digital counterparts" of citizens - a database for everyone, which contains the date and place of birth and other personal data. A person identifying in the state platform, using his “digital twin”, will interact with the digital ecosystem and receive digital services from it in accordance with his needs.

In addition, it is planned to develop functionality for the “chief IT architect of the department” who will decide how the information system of the authority in the end will look like in general and in detail. Its main goal is to ensure the solution of the tasks of the authority with the help of information technology. The role of each architect in IT is directly related to the increasing complexity of information technologies and the need to build and maintain a vertical downward approach to managing and sharing data and processes that affect the security, storage, compliance, application lifecycle management and the provision of network services. Depending on the authority, the chief architect can control and coordinate the efforts of other technological architects, including the chief security architect, chief data architect, chief architect of mobile technologies, and chief architect of cloud services.

Such a digital transformation will be aimed at introducing the “end-to-end” technologies provided by the Digital Economy program: industrial Internet of things, quantum computing, big data processing and analysis technologies, full product life cycle modelling systems, neural networks, artificial intelligence, virtual and augmented technology. reality, cloud computing, etc.

Improving the quality and improving the transparency of personnel records of civil servants, the formation of a single information resource on the staffing of the civil service - such proposals are contained in the federal project "Digital Public Administration". One of the sections of the project is devoted to the digital transformation of the public service. Thus, by the end of 2019 in Russia should earn a centre of competence for the implementation of the tasks of the federal project "Digital government". Mass training of government officials and digital skills and technologies should begin before the end of 2020, and by December 2021 it is necessary to ensure departmental (SED) and interdepartmental (MEDO) electronic document circulation using an electronic signature. A year later, at the suggestion of the project developers, standard automated workplaces of the civil servant will appear in the authorities, i.e., by the end of 2022 conditions must be provided for automated decision support and the conversion of the rule-making process into a “figure”. The centralization and optimization of work with personnel documents

along with the simplification, acceleration and unification of personnel procedures is given a little more time. All these processes must be carried out before the end of 2024.

Another of the proposed areas is the digital transformation of public services. Digital provision of public services will be provided until the end of 2022 in the amount of 85 services. Until the end of 2024, digital feedback with citizens and organizations and its control over mass public services, functions and services will be provided.

However, for the development of a “digital mentality” among the corps of civil servants, it is necessary, first of all, to rethink strategies in the system of their additional training in terms of passing training programs (modules) on digitalization of public administration. Digital transformation requires new approaches and, above all, investment in training and ongoing training of civil servants. It is necessary to develop digital management competencies among civil servants and at the same time conduct breakthrough research in the field of the influence of artificial intelligence, digital technologies on the public administration system (Winter et al. 2016).

Of practical interest is the experience of Australia in the use of modern technology to assess the effectiveness of professional performance of civil servants. Thus, in order to improve the quality of personnel work with employees whose activities do not meet the performance requirements, a special mobile application was launched in Australia, through which employees were asked a new question every day related to serving. Thus, the application gradually increased the employee's qualifications and created the conditions for a higher performance of his activities. In the United States, special software (USA Performance) is also used to evaluate the performance of professional service activities of federal civil servants.

The software allows you to automate the process of planning, monitoring and evaluating the performance of professional performance at all stages of the management cycle. With the help of this software, the authorities develop and approve electronically the performance plans of civil servants and monitor their performance, send feedback and evaluate. By optimizing the process of planning, monitoring and evaluating the performance of professional performance, the software allows authorities to focus on results, as well as ensure real-time performance management. Thus, digital technologies can significantly change traditional approaches to planning, monitoring and evaluating government results.

3 Opportunities and problems of involvement AI in public services

The question of who should be entrusted with managing AI, technology companies, to implement cooperation with the state, or whether international organizations should deal with this remains open. However, the prospects for state regulation of AI in the world are studied by state corporations, authorities, independent experts (Guihot et al. 2017).

Thus, the European Commission (2016) formed a group (AI HLEG - High-Level Expert Group on Artificial Intelligence) which consists of 52 high-level experts on artificial intelligence (including representatives from academia, civil society and industry) presented a draft of ethical guidelines for reliable artificial intelligence (EESC 2017). Next, we briefly review the recommendations for the implementation and implementation of reliable AI based on this document. Requirements for the reliability of AI include:

1. Accountability

Sound management of AI should include accountability mechanisms, the choice of which can be quite varied depending on the objectives. The mechanisms can range from monetary compensation (insurance without fault) to establishing the fault, to reconciliation without monetary compensation. The choice of accountability mechanisms may also depend on the nature of the activity, as well as the degree of autonomy. A case in which the system incorrectly interprets the claim for reimbursement of medical expenses and mistakenly decides not to reimburse them can be compensated with money.

2. Data Management

The quality of the data sets used is paramount to the performance of the trained machine learning solutions. Even if data is processed in confidentiality, there are requirements that must be met in order to have high quality AI.

3. Design for all

Systems must be designed in such a way that all citizens can use products or services, regardless of their age, disability or social status. It is especially important to take into account the availability of AI products and services for people with disabilities, who are a horizontal category of society and are present in all social groups, regardless of gender, age or nationality. AI applications should not have a universal approach but should be user-oriented and take into account the full range of human abilities, skills and requirements. “Design for all” implies the availability and ease of use of technology by any person anywhere and at any time, ensuring their inclusion in any life context, thus ensuring equal access and active participation of potentially all people in existing and emerging computer-mediated human activity. This requirement is related to the United Nations Convention on the Rights of Persons with Disabilities.

4. Management of autonomy AI (human oversight)

The right approach to ensuring properties such as safety, accuracy, adaptability, confidentiality, expandability, compliance with law and ethical compliance, largely depends on the specific details of the AI system, its scope, its impact on individuals, the community or society and its autonomy. Other things being equal, the greater the degree of autonomy granted to the AI system, the more extensive the verification and stricter management is required. It is necessary to ensure that AI systems continue to behave as intended when feedback signals become sparser.

5. Non-discrimination

Discrimination refers to the variability of AI results between individuals or groups of individuals based on the use of differences in their characteristics that can be considered intentionally or unintentionally (such as ethnicity, gender, sexual orientation or age), which can adversely affect such individuals or groups.

Direct or indirect discrimination through the use of AI can serve to exploit prejudice and marginalize certain groups. Those who control the algorithms may intentionally try to achieve unfair, discriminatory or biased results in order to exclude certain groups of individuals. Intentional harm can, for example, be achieved by explicitly manipulating data to exclude certain groups. Harm can also be caused by exploiting consumer prejudices or unfair competition, such as price homogenization through collusion or an opaque market.

6. Respect for privacy

Confidentiality and data protection should be guaranteed at all stages of the life cycle of the AI system. This includes all data provided by the user, as well as all information obtained about the user during his or her interaction with the AI system (for example, the results obtained by the AI system for specific users, how users reacted to specific recommendations, etc.). Digital data on human behaviour can contain highly confidential data not only about preferences, but also about sexual orientation, age, gender, religious and political views. The person controlling such information may use it to their advantage. Organizations should be aware of how data is used and can affect users and ensure that privacy and data protection are fully respected.

7. Strength

Reliable AI requires that the algorithms are safe, reliable, and reliable enough to deal with errors or inconsistencies in the design, development, execution, deployment, and use of the AI system and adequately deal with erroneous results.

8. Security

Security is about ensuring that the system really does what it has to do without harming users, resources or the environment. Procedures should be developed to clarify and assess the potential risks associated with the use of AI products and services. In addition, formal mechanisms are needed to measure and guide the adaptability of AI systems.

9. Transparency

Transparency concerns the reduction of information asymmetry. Readability, as a form of transparency, implies the ability to describe, test and reproduce the mechanisms by which AI systems make decisions and learn to adapt to their environment, as well as the origin and dynamics of the data used and created by the system. All models that use human data or that affect people or that can have other morally significant effects should be required to have a clear and open approach to choosing and making decisions regarding data sources, development processes and stakeholders.

The intensive development of technologies and units of artificial intelligence necessitates the adequate development of appropriate legislative support in this area, which is rather difficult without a proper understanding and adequate interpretation of the term “artificial intelligence”, without classifying the types and forms of artificial intelligence and describing the ethical features of its application.

The use of technology and AI units is effective to facilitate the implementation of various complex tasks of public administration. For example, in terms of improving the approaches to data collection, digitization, ordering; ensuring comparison, evaluation, verification, integration of data from various sources; ensuring the assessment of the quality and effectiveness of topical public welfare policies, as well as political programs and strategies; improving the system of government services, government contracts, government procurement (including the work on identifying grey and corruption schemes); implementation of intellectual feedback topology in public administration; strategic planning and programming of spatial-territorial economic and social development of the country, the federal district, the region, the municipality; in the search and evaluation of sites for public events; implementation of prognostic multicentred complex analysis in the framework of planning and programming of public administration, and many others (Nevejans 2016).

Here are some examples of how “big data” can be used for tactical planning and government decision making. The Federal Agency for Labour of Germany analyses the data of its clients (including data of unemployed citizens who applied for a job search), measures taken by the agency for their employment, as well as data on the final results reflecting the deadlines for finding a job for the unemployed. As part of the analysis, groups of unemployed were identified, for each of which measures were developed to facilitate their employment.

An example of the use of digital technologies in the planning of results (at the stage of state policy development) is the Predictiv (Predictiv 2019) online platform introduced in the UK, which allows real-time

behavioural experiments. The platform allows state bodies to test new measures of state regulation using randomized controlled trials with the participation of citizens in the online mode and to check how exactly the measures of regulation will be implemented, other measures of state policy in real life. In fact, the platform allows for the experimental implementation of regulatory measures and receiving feedback from its recipients. In particular, the Predictiv platform can be used: to test the degree of understanding of regulatory measures by regulatory recipients; assessing the expected impact of new approaches; choice between several public policy alternatives.

Randomized controlled trials take one to two weeks and allow authorities to get answers to questions that previously required years of research. The Predictiv platform enhances the availability of experimental predictive analytic methods for government agencies and, possibly, will lead to a change in the culture of public policy development and regulation. The platform is used by the UK government for many useful purposes.

In general, digital platforms provide the development of analytical tools associated with the use of "big data", can significantly improve the quality of forecasting political and economic processes, which expands the management capabilities of the state. Thus, in the United States, an initiative is being implemented aimed at studying and introducing methods of processing "big data" into the activities of government bodies. At the same time as the source of such data are considered a variety of areas. Based on the research, in some areas, algorithms were developed to respond to the results of analytics of "big data". For example, the U.S. Securities and Exchange Commission uses similar algorithms to detect and stop abnormal trading activity when trading on the stock exchanges, thereby reducing the risk of financial fraud. The use of "big data" based analytics at the US Federal Housing Agency allows "to predict interest rate fluctuations, to build various models for maintaining an acceptable level of return on capital.

The U.S. practice is also interesting from the point of view of the experience of using artificial intelligence technologies in planning control and supervisory activities. For example, the public health department of Southern Nevada has oversight functions that conduct inspections of food safety businesses. To improve the effectiveness of control and supervisory activities, the department introduced AI technology using Twitter user data (the application uses geolocation data and natural language recognition technology) about restaurant visits and their feedback in order to compile a list of catering establishments for inspection.

Digital technologies can significantly transform the processes of monitoring and evaluating the results achieved. In this sense, international initiatives on the use of "big data" for official statistics (including as an alternative to the traditionally used methods) are of interest. Most of the projects on the use of "big data", implemented by national statistical agencies and other interested authorities, are devoted to issues of economic and financial statistics, demographic and social statistics, as well as data on prices (inflation). Thus, projects on the use of "big data" in the field of price statistics were implemented in Austria, Belgium, Denmark, Italy, China, Canada, the Netherlands, Norway, Korea, the Czech Republic, Hungary, Switzerland, the USA and other countries, as well as at the level of Eurostat; The main sources of these projects were scanner data in supermarkets on actual prices for consumer goods, prices for products published on the Internet. For estimating household spending, "big data" on credit card spending is widely used, for metering utilities consumption — data from smart meters, etc.

Thus, the technologies of the Internet of Things and "big data" make it possible to use fundamentally new data sources beyond the limits of traditional statistics and administrative data of agencies for monitoring the results of public policy implementation. And the optimization of the architecture of digitalization of public services allows to clarify the functions of the public authorities themselves.

4 Traps of digital transformation of public services

Now, we should also mention the "traps" of digital transformation of public services. In general, many analysts believe that the digital transformation of the state sphere will inevitably lead to the era of "digital totalitarianism" (both Chinese and Western) due to the existing strengthening of digital control (the system of "city assistants" that encourages citizens to report violations of traffic rules and public order; credit ratings of banks, etc.). However, trust ratings are already being successfully implemented (for example, in China). The prerequisites of the "digital dictatorship" contribute to the development of cyber riots and hacktivism.

Cyber riots are aimed at the resistance of network users against the authorities. Given the gradual pressure of the authorities on the rights and freedoms of users offline, there is growing discontent with the activities of politicians and public servants. At the same time, for the most part, this is the result of the work of ordinary cyber fraudsters and cyber vandals, operations of special services.

Hacktivism is a form of social and political activism that is carried out via the Internet using hacking tools. The main goal is the practical realization of the freedom of speech in the network (possibly, publication of the obtained secret data, blocking Internet sites, hacking Internet accounts and supporting various forms of civil disobedience). The term hacktivism arose in the first half of the 1990s, its authorship is attributed to a member of the hacker group Cult of the Dead Cow with the nickname Omega. However, one of the first actions of hacktivists is most often called actions organized in the late 1980s by Australian hacker and political activist Julian Assange

(then acting under the nickname “Mendax”). Together with other hackers, “Mendax” created the International Subversives group, on whose account information systems hacking and obtaining secret data from many organizations, including military, government and banking (Mikhaylova 2014).

The most famous international hacktivist groups: Anonymous, Cult of the Dead Cow, EDT (Electronic Disturbance Theatre), Chaos Computer Group. Sometimes, because of the radical activity, hacktivism is compared with cyber-terrorism, the essence of which is to conduct terrorist attacks in virtual reality.

It should be noted, however, that activists, like ordinary citizens, seek to use the Internet as a goal and means of progressive "democratization". The growing popularity of the word “empowerment”, which is difficult enough to translate into other languages, but in essence means the empowerment of people, reflects the emergence of opportunities for individuals and groups, as well as their willingness to respond to their political environment.

5 Conclusions

All in all, it appears that by combining data from various sources, working with unstructured and partially structured information sources, testing individual initiatives in controlled trials, integrating continuous feedback gathering into the process of developing, monitoring and evaluating government regulation allows the state to better identify and solve problems of today, as well as to predict and respond to the challenges of the future.

Therefore, the digital transformation of the civil service does not represent just the automation and optimization of individual processes in the provision of government functions, including the provision of public services, the introduction and use of certain modern ICTs to ensure the activities of government bodies. Digital transformation is designed to qualitatively change the content of public administration, including its individual procedures, stages of the management cycle, public functions, and this change should lead to an increase in the quality of public administration: ensuring greater validity of government intervention (and reducing the role of the state as a whole) and the effectiveness of public authorities.

Thence, integrated solutions are needed to create a new digital public administration ecosystem. At the same time, digitalization should not be imitated in government bodies, but become one of the key tools for effective management. In addition, the exchange of experience with other countries, the involvement of the best foreign specialists in mutually beneficial cooperation, the sending of civil servants and experts in digitalization to other countries plays an important role in expanding the enormous potential for modernizing public administration in the digital age.

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