

# Digitalization of energy facility management processes in the Voronezh region

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**Abstract.** The classification of regional electronic information resources is given. The main type of interaction between the subjects and objects of regional management is defined - interaction through electronic information resources. The main factors hindering the digital transformation of the Voronezh region are highlighted. The models of digital transition for different regions are given. Formed proposals for the digital transformation of the Voronezh region. The necessity of creating a single digital platform - an information-analytical model of the region, through which studies of the interdisciplinary nature of factors directly or indirectly affecting the socio-economic development of the territory can be carried out. A key mechanism in the work of the platform is proposed - a dynamic feedback loop applied at any level of regional management from an urban facility to a single community or individual consumer.

## 1 Introduction

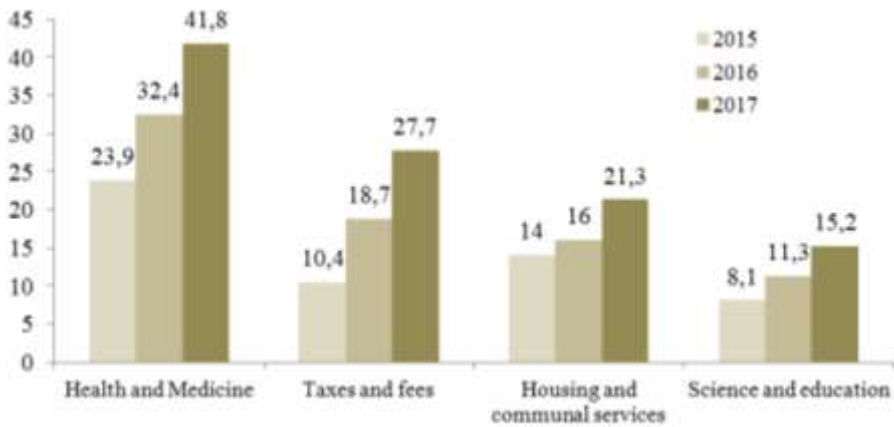
Adopted in 2017 The program "Digital Economy of the Russian Federation" involves improving the efficiency and competitiveness of the economy, public administration, social sphere. Among the priorities of the program is the creation of a modern information infrastructure that will allow you to quickly and safely transfer, process and store large amounts of data, and respond not only to modern requirements, but also to the requirements of tomorrow.

The current state of the public administration system in Russia does not correspond to modern challenges. The established system of strategic planning is formal in nature, almost unrelated to the daily work of the executive authorities and the practice of resource allocation, and does not provide for real responsibility for achieving strategic goals. At the same time, the country has shown positive results in the development of infrastructure for digital access and the introduction of digital technologies in the fields of education, health, culture and social services and housing and communal services (Figure 1) [1].

The barriers of digitalization remain at the interdepartmental level and at the level of regions and municipalities, in the sphere of transformation of internal processes of public administration, in data management. Digital transformation is the correspondence of the digital transition to three key criteria - validity, effectiveness and efficiency.

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**Fig. 1.** The most popular categories of state and municipal services received by the population,% of the total population receiving services.

The purpose of the research is to substantiate the choice of a digital transition model of the Voronezh region to a new level of development, features and characteristics of digitalization of management processes for various objects in the region, as well as to determine the direction of further development of the proposed model. The study was conducted on the analysis of materials characterizing the development of this concept in various subjects of the Russian Federation.

## 2 Materials and Methods

In the process of digital transformation, the construction of a new ecosystem of the information state takes place along with the existing systems of state automation based on new principles and technologies that give government control qualitatively new opportunities [2].

The dissemination of information, the delivery of high-quality and efficient services is based on the implementation of the service activity model [3]. And of particular importance for this is the change in the business processes of the authorities, which should be reoriented towards the provision of public services to the population and business at a new level.

Characteristic features of the digitalization of the regions are: the massive introduction of information and communication technologies in all spheres of life; mobility; social communications; cloud technologies; big data and predictive analytics; machine learning and artificial intelligence; cybersecurity technologies; "Internet of Things". Using big data allows you to get information about the results achieved in near real time mode. Artificial intelligence is not limited in perception by several indicators and helps to process thousands of parameters and choose the best solutions. The Internet of Things allows you to collect data and adjust actions automatically. Distributed registry technologies exclude the possibility of distortion of data on the results achieved. On an adopted technology, the digitalization process does not end there, and clever use of the adopted technology that requires smart management is of great importance [4].

The factors hindering the digital transformation of the process of managing the regions of the Russian Federation should be attributed to [5]:

- lack of operational and accurate information about the results achieved at all levels;

- outdated methods of work of the authorities, the predominance of manual data entry into state information systems;
- the closed nature of the data series, the resistance of the participants of the interaction to their disclosure;
- the gap between services and internal processes of departments;
- creation of a significant number of partially duplicating each other in the functionality of information systems;
- complexity in the integration of internal systems;
- the lack of a unified control center for the digitization of the region;
- the need to develop a regulatory framework and a digital transition management system at the municipal level.

Among the key risks of introducing digital technologies are the loss of controllability in critical areas of public administration; unauthorized use of personal data; the possibility of human rights violations in automated management decisions; resistance of the authorities to the transition from departmental informatization to platform (supra-departmental) solutions (risk of loss of controllability, fear of openness of their data). payouts

In the digitalization of regions, three models of digital transition can be distinguished [6]:

- decentralized - digital transformation is carried out with the participation and large support of business in a large market capacity for the introduction of smart city technologies;
- centralized - the digital transition process is coordinated at the level of local governments, mobilizing the maximum number of available resources and involving a significant number of actors in the process;
- a model of local actions - in which, due to the lack of resources, digital, individual, most problematic infrastructure sectors or sectors of the urban economy are subject to digital transformation.

The main resource in modern society and economic processes is information that is transformed into knowledge and is able to influence the internal and external environment of management objects, their behavior patterns. With regard to regional management, information resources by type of interaction can be classified as follows [7]:

- interaction resources, suggesting the availability of information flows from the subject of regional management to the object and back (when organizing the management cycle), or from the object of regional management to the subject and back (when organizing communication and consultation procedures);
- informing resources, suggesting the presence of a unidirectional flow of information from the subject of regional management to the object (as a rule, they are intended to bring a certain amount of information to control objects without feedback);
- aggregating resources that perform the functions of collecting information from management objects in the interests of subjects.

With the development of information technologies for collecting, accumulating, synthesizing, analyzing, preparing and transmitting information, the issues of improving the interaction of individual participants in joint actions are becoming increasingly important. This problem is especially relevant in the context of the repeated growth in the number of regional electronic resources that serve to establish interaction between the subjects and objects of regional management. To solve this problem, the region needs to create a digital infrastructure, a platform for digital services - an information and analytical model of the region, with the help of which research can be conducted on the interdisciplinary nature of factors directly or indirectly affecting the socio-economic development of the territory. This

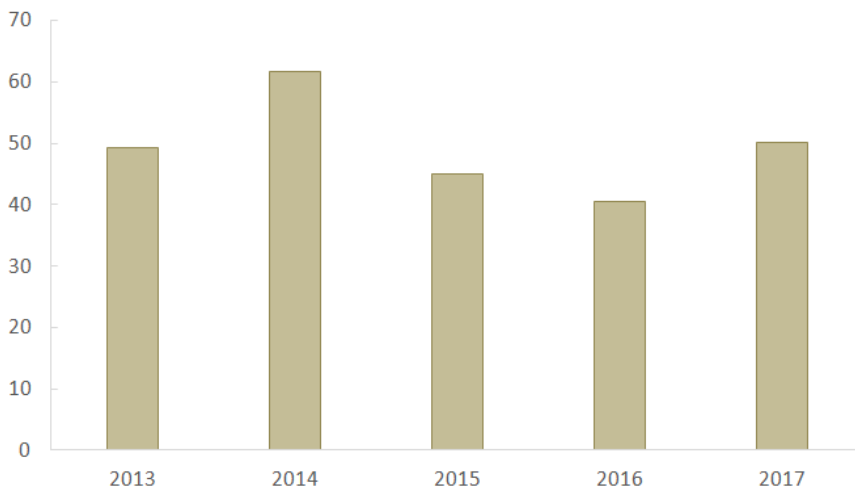
will improve the quality and speed of providing modern services, will contribute to the development of new services.

### 3 Results

The choice of the optimal scenario of digital transformation of the Voronezh region largely depends on the goals that the region sets for itself, the technological base and the digitalization level of the urban economy.

In the Voronezh region, the creation of a single data space of the region, the rejection of paper information exchange and the transfer of information resources of the region into electronic form is planned by mid-2019 [8]. The holistic architecture of the digital region in the Voronezh region has not yet been assembled, only individual urban infrastructures — transport, energy, modern production, the provision of public services, education, and health care — are digitized mainly.

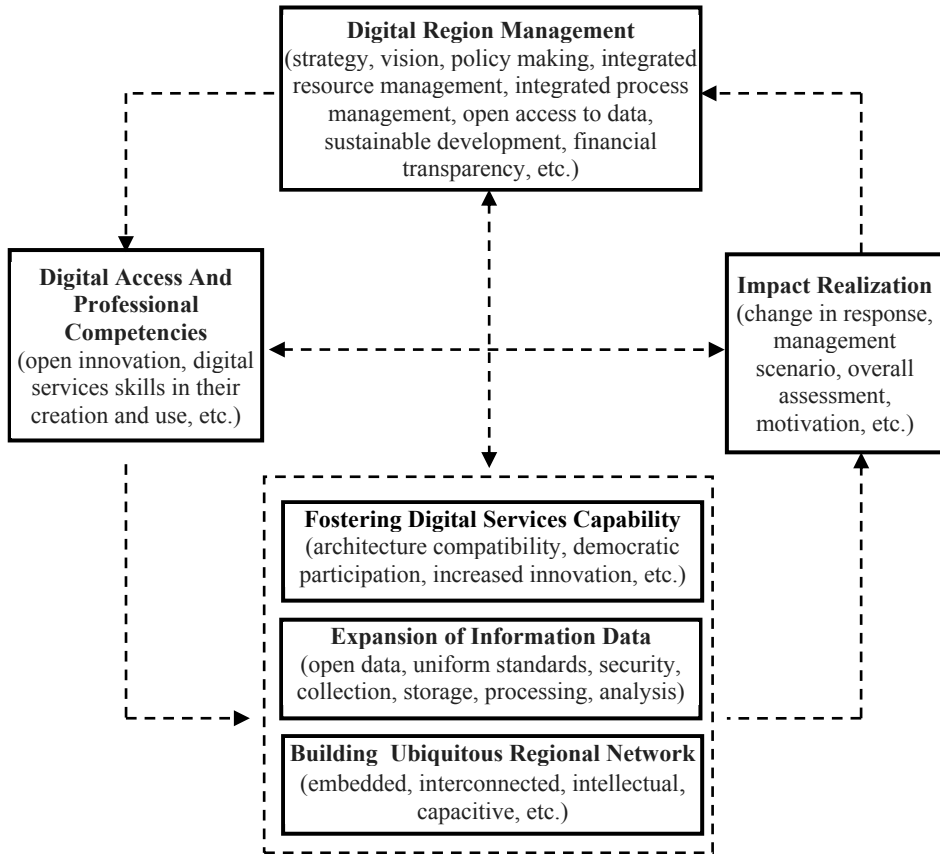
The Voronezh Region, like other constituent entities of the Russian Federation, is interested in increasing the speed, quality and coverage of the provision of services, in increasing the rate of change made in the processes of providing services, and also in reducing government spending. However, today the share of electronic document circulation between government agencies and departments is no more than 60% (Figure 2).



**Fig. 2.** Share of electronic document circulation between state authorities, in the total volume of interdepartmental document circulation, %.

The Voronezh region belongs to the technologically developed regions of the Russian Federation, the digital transformation model can be defined as centralized. In the region today, digital transformation of housing and communal services, the system of municipal management and the provision of services to the public is necessary [9].

To increase the efficiency of digitalization of the management processes at the facilities of the Voronezh Region and the development of the technological ecosystem, it is proposed to create a unified digital management platform that closes all areas of city life together. The key mechanism in the work of the platform should be a dynamic feedback loop applied at any level of regional management: from an urban facility to a single community, groups or individual consumer (Figure 3).



**Fig. 3.** Feedback cycle in digitization of regional management processes.

Each cycle stimulates new actions by the participants in the relationship, which are approaching the common goals of the region's development. Feedback loops can be performed in macro and micro cycles, determine actions and changes associated with driving each new element into the platform [10]. The result of the feedback cycles is a gradual digital transformation of the Voronezh region, where computing technologies contribute to the sustainable development of the city, the development of its economy, environment and quality of life.

The platform will help to perform most of the management functions not with the help of the authorities, but on the basis of platform solutions. The transition from one form of execution to another is possible on the basis of the following approaches:

- expansion of digital services through the compatibility of architecture, democratic participation, the expansion of innovation, flexibility and speed, the rapid change and debugging processes under the result, and transfer it "to the market";

- expansion of information data through the constant accumulation of objective data about management objects, the implementation of control through the use of big data technologies, the Internet of things, artificial intelligence, the transfer of information systems the right to make routine decisions;

- constructing a regional network and the implementation of all government functions, commercial services based on a single digital data storage platform, automating business processes, analytics, reducing the number of process steps.

The main goal of the approach is to create a single cycle of interdependence of the development, operation and deployment of digital technologies to help process participants

to quickly create and update software products and services that are operated in real time.

An integral part of the region's digitization is the focus of solutions on the development of digital skills, management training, the creation of public-private partnerships, the creation of innovation clusters, the development of the local market and financing mechanisms. Special attention should be paid to the development of digital infrastructure in remote and rural areas, as well as raising awareness of the rural population about the benefits of digital services [11-13].

The platform will expand access to the use of digital technologies and reduce inequalities at the regional and municipal levels, as well as enable less advanced areas to take advantage of the implementation of national programs for the development of the digital economy and effectively adapt them locally.

## **4 Discussions**

Thanks to the digitization of processes and services and the implementation of related organizational changes, it is possible to significantly improve the quality of public services, reduce the cost of providing them, make them more accessible to citizens and businesses.

The proposed mechanism for the digitization of objects management processes in the Voronezh region can be used in any other region of the Russian Federation. Such an approach, which involves testing in practice and piloting the implementation of solutions and concepts in a particular region and their subsequent deployment in other parts of the country, should be considered as a model when developing state digital systems.

The implementation of the feedback cycles will help identify and fill in the missing necessary professional competence in digital transformation of objects, like entrepreneurs, to competently build high-tech business, mentors and investors, to direct such initiatives and be prepared to support them, both in government and among various users of services.

A prerequisite for the operation of the platform is to increase the amount and improve the quality of open government data that can be used by technology entrepreneurs to develop digital products and services. This format of open innovation allows government agencies to contribute to the creation of socially valuable products, for example, applications with background information on medical and educational institutions, public transport schedules, etc., at minimal cost. Today, there are many examples of how the state, creating platforms and making data accessible, sets the stage for the prosperity of new businesses in dozens of industries: from transport to education.

A unified storage model combines data from various sources: government data (open and restricted access), socio-economic statistics, industry data, scientific data, etc.

## **5 Conclusion**

To improve the competitiveness of the economy, a new quality of government is needed. It can only be achieved by moving to new models of process and data management. The work highlighted a key element of the digital urban ecosystem and its individual components - these are the data on the basis of which housing and utilities systems, transport, energy, health, etc. are managed.

In the course of the study, the features and characteristics of digitalization of the management processes of various objects of the Voronezh region, the factors hindering the speedy digital transition rate were identified. The holistic architecture of the digital region has not yet been built, only individual urban infrastructures have been digitized.

In this work, an integrated approach was used in which management processes are considered from the point of view of the socio-economic aspect, which makes it possible to

most effectively identify the subjects and objects of management, take into account the interests of government, business and the public.

For the digital transition to a new level and determining the direction of further development of the region, the paper proposes the creation of a digital infrastructure-platform for digital services. The proposed solution of digitalization of the management processes of objects in the Voronezh region allows us to form a feedback mechanism with stability, with the ability to retransmit to other regions of the Russian Federation. This will improve the quality and speed of the provision of modern services, will contribute to the development of new services. The proposed solution of digitization of objects management processes in the Voronezh region allows the formation of a feedback mechanism with stability, with the ability to relay to other regions of the Russian Federation. This will improve the quality and speed of providing modern services, will contribute to the development of new services.

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