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## INTRODUCTION OF DIGITAL TECHNOLOGIES IN THE SPHERE OF HOUSING STOCK MANAGEMENT IN THE REPUBLIC OF UZBEKISTAN

**Abstract:** In the digital economy, information is the most important resource that is directly formed, stored and transferred through information technology. Within the framework of this issue, it seems necessary to consider the information interaction of participants in the housing and communal services market - management and resource supplying organizations, government agencies, as well as property owners.

**Key words:** management, housing stock, information system, geographic information system, GIS, housing and communal services, management system.

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### Introduction

The coronavirus pandemic in the world has changed people's habits and affected almost all areas of life. The most notable trend is global digitalization. It should be noted that digitalization is entering a qualitatively new stage, its development characterized by the development of information and communication technologies. According to experts, digitalization has huge potential for business and society over the next decade and could bring an additional \$ 30 trillion. dollars of the world economy over the next ten years (until 2025) [1].

Currently, there is an increase in the construction of residential real estate in the world, thereby changing housing standards. Consequently, there is a growing need for effective management of both private and public property. In the digital economy, there is a digital transformation of cities, united under the term "smart city", they imply the use of digital technologies in city management, these innovations

should improve the lives of citizens, improve management efficiency, which in turn leads to an increase in resource savings.

Every year, the world's megacities are getting smarter thanks to the introduction of smart technologies. Smart systems in Barcelona have solved problems with water, electricity, air pollution, debris, noise and parking spaces. Smart systems are changing the world and are already in use in London, Oslo, Amsterdam, Shanghai, Zurich, Boston, Nice, Amsterdam, Stockholm and others.

The Republic of Uzbekistan, which implements the national program "Digital Uzbekistan" [2] and the project "Smart City" [3], is not an exception. According to international recommendations, the creation of favorable living conditions is achieved at the level of 20 square meters of living space per person. At the same time, the indicator of security in the Russian Federation is 23.4 sq. m., in Brazil - 19.4 sq. m., in Turkey - 17 sq. m.

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It should be noted that in recent years in Uzbekistan there has been a tendency to increase the level of housing provision (from 15.2 sq.m in 2015 to 15.8 sq.m in 2018) in the country as a whole, from 15.4 sq.m up to 16 sq.m in cities and 15.0 to 15.7 sq.m. in the countryside.

If you look at the context of the regions of Uzbekistan, the provision of housing per person remains quite low, for example, in Andijan region (10.4 sq. m), Bukhara region (14.8 sq.m), Jizzakh region (13.9 sq. m), Ferghana region (13.4 sq. m) and Surkhandarya region (12.7 sq. m) regions. The gap in the level of security of the regions (the highest Khorezm region: 24 sq.m) and the lowest (Andijan region: 10.4 sq. m) is more than twice [4]. But, despite the growth in the average living space per capita in the country as a whole, the level of housing provision in Uzbekistan remains relatively low compared to other countries.

As analyzes show, the main reasons for the current level of housing provision are: population density, which is associated with high birth rates; housing construction is out of balance with the demographic trend; the lack of a purposeful policy for the construction of residential buildings, considering the availability for the low-income population.

With the growth of the housing stock, it becomes necessary to create digital platforms and information databases in order to improve the quality of property management by using the entire set of information about the object, legal and spatial.

As mentioned above, industries in most countries of the world are already affected by digital transformation. The general trend towards digitalization affects, to a greater or lesser extent, all sectors of the economy and the housing sector is no exception.

### Main part

The study of scientific works and studies of foreign experts shows how important databases and information technologies are in the formation of theoretical and practical aspects in the field of real estate management. It should be noted that methodological approaches have not been fully introduced into the practice of real estate management and have not been fully studied. The development of information systems for managing the country's housing stock, improving the property and social relations of the population to their homes, as well as further expanding the participation of homeowners in managing their property remain relevant to this day [5].

The main distinguishing feature of the information society is the widespread introduction of information and communication technologies (ICT) in all spheres of human life, including the housing and utilities sector. According to the Law of the Republic of Uzbekistan "On Informatization", the term "information technology" means a set of methods, devices, methods and processes used to collect, store, search, process and disseminate information [6].

As part of the scientific article, an analysis was made, which identified some problems in the field of real estate management, which have a negative impact on the efficiency of performing certain tasks.

Table 1 shows a list of the main tasks and information that is required by the subjects of the real estate market (the state, real estate owners, investors, real estate and financial organizations) in which the share of activities in the field of real estate management is large compared to the rest.

**Table 1. Information necessary for the subjects of the real estate market\***

Main tasks	Information about real estate objects required by subjects	Existing problems
Real estate accounting	Cadastral number, coordinates, information about the owner	There is no unified property management system
Information provision of subjects with information about the real estate object	Information depending on the needs and tasks of the subject of the real estate market	Lack of a unified electronic database Lack of reliable information
Real estate cadastral valuation	Taxable base, area, number of storeys, location, completion rate, wear, type of construction, environmental performance, market price, etc.	Lack of a unified electronic database Lack of reliable information
Tracking the degree of depreciation of real estate objects	Technical characteristics of the property	Lack of technical passports of real estate objects
Collecting property tax	Cadastral number, taxable base, cadastral value, legal information	Lack of reliable information
Technical content of the property	Technical characteristics of the property, layout	Lack of technical passports of real estate objects

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Real estate transactions	Legal information, market information	Lack of reliable information
Real estate appraisal	Legal purity, technical, spatial, environmental, cost characteristics of the property	Lack of reliable information
Investing projects	Legal purity, technical, spatial characteristics of objects	Lack of relationship with the state. subjects
Building	Legal clarity, market performance	Lack of a unified electronic database Lack of reliable information
Analytical forecast	Technical characteristics of the property, market indicators	Lack of a unified electronic database Lack of reliable information

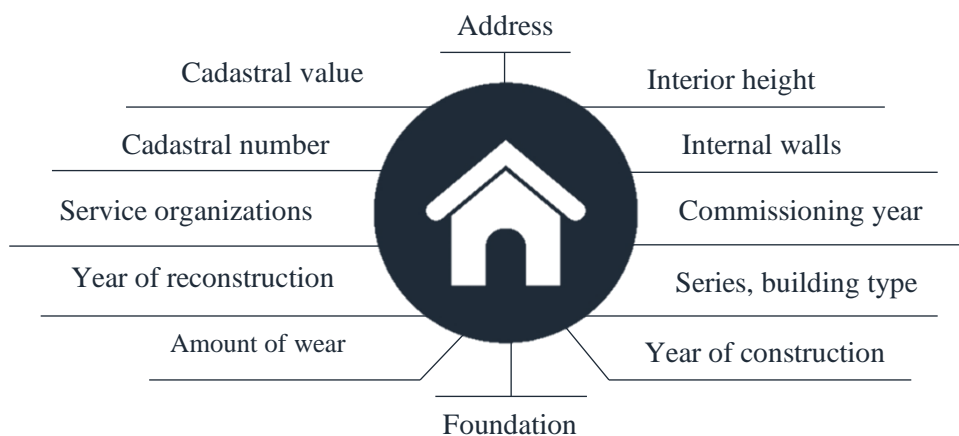
\*Source: Compiled by the author based on the analysis of information resources of Uzbekistan

Based on the analysis, we can conclude that the main part of the problems is associated with the lack of necessary and reliable information about real estate objects. Accordingly, the solution to these problems is seen in the creation of a unified state digital platform, a unified digital platform and its implementation in the field of real estate management, will positively affect and fundamentally change the collection, storage and use of information about real estate objects [7].

To implement this idea, the authors propose the creation of electronic passports of real estate objects, which would be integrated with a geographic information system (hereinafter - GIS), since GIS works with all types of information that can be reflected on a map or on a diagram. This means that GIS is the technology that combines traditional information management models with maps and databases [8].

The introduction of electronic passports would allow combining existing documents certifying property rights, technical and cadastral passports into a completely new information management tool and would become the main documents, the content of which would include the main technical, physical, economic characteristics of real estate objects that are necessary for monitoring and management (pic. 1).

As noted above, when integrating an information base with GIS systems, they give significant advantages in real estate management, since GIS shows an integral description of real estate objects, since it is present in the database and documents as various files, and GIS also allows you to see the location of any real estate object in space, to determine the influence of some objects on others, as well as to analyze external and internal factors influencing the formation and functioning of the real estate object [9].



**Pic. 1. Real estate e-passport model\***

\*Source: Compiled by the author based on data analysis

In the presented model, the authors show the based information database about the real estate object, based on the needs of the subjects of the real

estate market, this model can be supplemented with the necessary data. It should also be noted that some data can be attributed to unchangeable (territorial

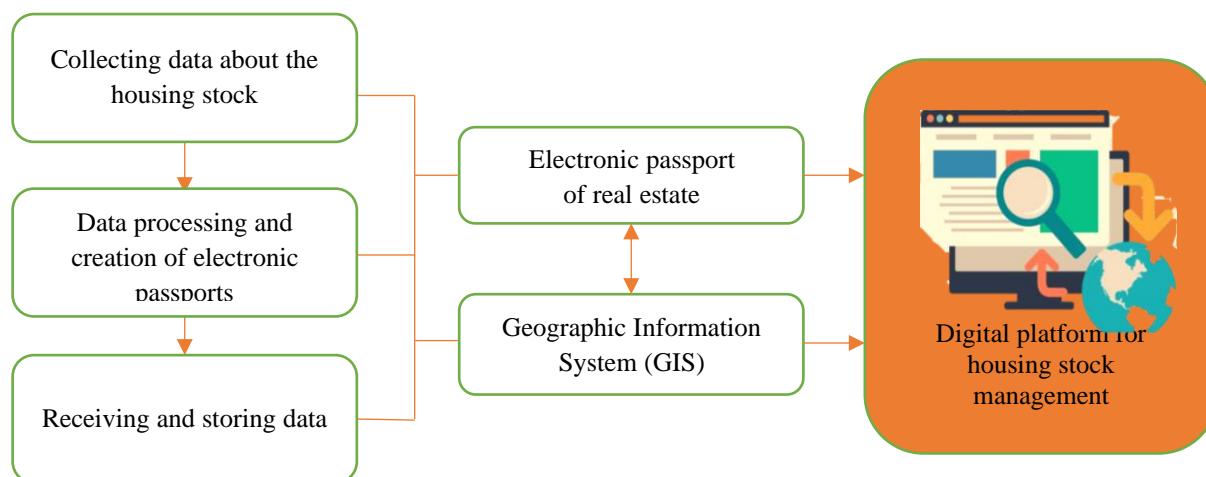
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location, design and technical parameters, etc.) and changeable (the amount of property tax, cadastral value, technical condition of the object).

Integration of the information system for managing the housing stock with GIS (pic. 2) will allow solving such problems as: inventory and accounting of all real estate objects located on the

territory of the state; display of detailed attributive information on real estate objects; providing the necessary information for making management decisions, analyzing the situation on various topics based on the available data; increasing the efficiency of interaction between government services and property owners, etc.



**Pic. 2. Scheme of building a unified digital platform for housing stock management \***

*\*Source: Compiled by the author based on data analysis*

It is worth noting that the created digital platform for housing stock management will need constant maintenance and support throughout the entire life cycle of the system to ensure its uninterrupted and correct operation.

In the course of the scientific study, constraints were identified that impede the informatization of the housing and communal services industry; these include the different level of informatization of the subjects of the housing and communal services market, the lack of systematic collection of information, the lack of uniform standards and formats for collecting information. The indicated factors are one of the main causes of difficulties and distortion of information at all stages of data collection and transmission [10].

### Conclusion

Based on the results obtained, it can be concluded that the information support of real estate market entities is the most important aspect, since it allows to reduce uncertainty and risk, contributing to the implementation of certain goals of the entity, and the following recommendations are proposed to solve these problems:

1. Creation of technological standards, the development of digital platforms in the field of housing stock management and housing and communal services at the republican and regional levels, which would allow the authorities to obtain data on housing facilities on the construction and

housing and communal services sector for conducting analytics throughout the country when making management decisions, the possibility of citizens receiving complete and up-to-date information about the house, on the method of house management, on the list of services provided for the management of common property in an apartment building, work performed on the maintenance of common property in an apartment building, current and major repairs, on the management and resource supplying organizations, on payments for residential premises and utilities.

2. The regulatory framework in the field of housing and communal services is largely incomplete, unstable and subject to frequent changes, regulation in the field of digitalization is almost completely absent. Taken together, this creates rather high barriers to entry for independent developers, manufacturers of software, technologies and equipment, which could contribute to the further development of modern technologies in relation to the housing and communal services industry.

3. Further improvement of social and public-private partnership relations (broad attraction of foreign investors mainly in this area), which will be aimed at the effective use of the housing stock of the Republic, in particular, for its repair, maintenance and management, as well as improving the quality of housing and communal services provided to the population and significant cost savings in this area.

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In conclusion, it should be noted that the digitalization of the housing and communal services industry. would allow, first of all, to increase the efficiency of management processes, which in turn leads to a decrease in losses, a decrease in indirect and overhead costs in tariffs, etc., secondly, it would allow to reduce the volume of accounts receivable in the industry, thirdly, ensuring industry transparency for public oversight and regulation, fourthly, improving the quality of the provided housing and communal

services by creating elements of market competition in the industry and, as a consequence, reducing tariffs. In addition, this is the creation of conditions for attracting private investment in the development of the industry and, finally, the formation of a database of complete, reliable and up-to-date data in the field of housing and communal services - on the state of the housing stock, on the volume and quality of services provided and energy consumption, on consumers of housing and communal services.

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