The formation of the digital economy and its conceptual model

Abstract. This article presents various scientific approaches to digital economy, separate groups of digital economy theories and conditional separation of authors according to them, its three main stages in the formation of conceptual integrity of digital economy, the system of relations of its institutional components in digital economy development, its mechanisms in digital economy. The main components of the economy: e-government; electronic commerce; opinions on electronic employment are stated.

1 Introduction
The Republic of Uzbekistan has been the most successful in the field of environmental protection and technology and has been the most successful in the field of environmental protection in the Republic of Uzbekistan.

2 Methods

- Comparative analysis, induction and deduction methods and systematic approach, generalization, statistical, abstract analytical methods and others were used in the research process.
- The company's infrastructure, including the ACP and the resource management system, has been designed and developed in accordance with the requirements of the law of the Republic of Kazakhstan, the company's resources are not subject to any restrictions, and the company's infrastructure is not subject to any restrictions, and the company's resources are not subject to any restrictions.
- A comparative analysis of the development of the digital economy in different countries of the world (developed and developing) through its models. According to the comparative analysis of the digital economy on the models of different countries, it is experiencing the development of new trends.
- The following is a list of the most common types of information that can be found in the following sections.
- The following are the most important elements of the system: the quality of the data and the synthesis of the statistics. The Republic of Kazakhstan is a country with a high level of environmental awareness and a high level of transparency in the field of electronic data collection, electronic data collection, and electronic data collection of statistics by the Institute of Statistics. The republic's government has been given the opportunity to develop its own statistics (e.g., electronically) in a manner that is in line with the law of the republic.
- The following is an example of how to use the information in the Internet, and how to use the information in the Internet in a way that is not possible.
- Analysis and synthesis of theories of a new type of economy, the views of scientists, their definitions, using the methods of induction and deduction, i.e., from private to general (relationship between enterprise and economy, state, government) or from general to private (digital economy, state government-citizens, impact on the performance of enterprises). As a result, the main tasks of the development of ICT and digital economy in Uzbekistan are defined by government agencies and consistently implemented at all levels.
3 Results and discussion

Modern economic science is on the verge of forming a new paradigm that reflects the current reality of the comprehensive use of information technology, the impact of which has led to the formation of a new economic system. The results of the study showed that there is currently no universally accepted definition of digital economy in economics, and various scholars and researchers have advanced the identified basic features of digital economy in their proposed theories. Today, the growing role of information and the introduction of communication technologies in production has led to the formation of an informed society, based on intangible, intellectual resources: information, knowledge, science and human capital, rather than traditional material.

The first research in information began in 1940, in the newly emerging science of cybernetics. K. Although Shennon in his research on communication theory was limited to analyzing its quantitative and technical properties, he laid the foundation for the development of information theory. N. Vinep gave a scientific definition of the category of "information", describing it as a general scientific concept, not a specific one. It should be noted that this technocratic approach still dominates the study of information, which narrows its important content features and assesses its role in social development. To a certain extent, this limitation is overcome by using different scientific approaches to its interpretation in modern information theory.

Scientists directly link the emergence of a new type of economy with the concept of the information society. There are three approaches to defining the essence of the information society, which is related to the information (intangible) sector in the growth of gross domestic product (GDP). American researchers Maxlup, M. Popat, D. Bell and others support this view. The second approach is based on the theory of "information explosion", according to which the amount of information available to society increases, which leads to a qualitative change in the economy—the emergence of an information society. The approach is mainly based on the work of Japanese scientists T. Umesao, Yu. Hayashi, Yu. Ito and is little known in the West. In the third approach, the main characteristic of the information society is the spread of ICT, which European economists E. Developed in Daff, C. Nop i A. Mink theories. Researchers Steinfield and Calvadgio in 1989 singled out a separate group of "synthetic theories" that combined the above approaches. It is important to note that the fundamental definition of the information society should reflect all three approaches.

The category of a new type of economy was developed in 1976 by the American economist M. Introduced into scientific circulation by Porat, he analyzed his main problems a year later. The main characteristic of this type of economy was the dominance of information networks that dominate the economy.
The unity of ideas, assumptions, and hypotheses about the immediate prospects of economic development expressed by Mahlup provided the basis for further research by Western scholars in this field.

In general, a meaningful analysis of the new type of economy conducted in the scientific work of researchers such as Maptin, A. Nopman. First of all, this was Bell's theory of the 'Information Economy', which was later transformed into M. Castells' concept of 'network society' (or 'network economy'). Researchers in the field of information economics (D. Bell, T. Ctounep, V. Inozemtsev, etc.) distinguish the technological criterion as the main, but at the same time, not the only criterion.

In general, the 4 groups of theories of digital economy and the authors belonging to each group can be conditionally divided as follows:

1) The theory of international information exchange (M. McLuhan, 1962), Z. Brzezinski (Brzezinski, 1970), E. Toffler (Toffler, 1980), I. Melyukhin (Melyukhin, 1997) and others;

2) Network Economic Theory (M. Castells (Castells, 2000–h.v.);

3) Theory of knowledge economy (P. Drucker (Drucker, 1999–h.v.), UNESCO (UNESCO, 2005–h.v.);

4) Theory of digital economy (D. Tapscott (Tapscott D.), N. Negroponte (Negroponte N.), E. Brynjolfsson (Brynjolfsson), B. Kahin (Kahin), B. Johansson (Johansson), Ch. Karlsson (Karlsson), P. Stough (Stough R).

Researcher M. McLuhan promotes the idea of "electronic society". M. McLuhan believes that electricity played a major role in the development of civilization. It connects people all over the world in an instant, removes the boundary between day and night, and turns the world into a "global village". E. In his work The Third Wave, Toffler identifies three waves in the history of civilization, the third of which is the post-or superindustrial wave (since the 1950's). At the same time, he never once gave a direct definition of an "informed (or post-industrial) society". He describes the definition through a "revision of the code of civilization". In an informed society, the following principles work (individualization, despecialization, desynchronization, optimal combination of large and small, deurbanization).

According to the Castells concept, in recent decades a new type of economy has emerged in the world called "informational and global". Castells' main conclusion is that in an era of informationism, the existence of an economy is only possible when there is a global network that connects economic agents.

All this leads to the formation of a network society, as "it is created by networks of production, power and experience that shape the culture of virtuality in global flows that cut time and space". UNESCO has made a significant contribution to the development of the concept of "Knowledge-Based Society". UNESCO's Global Report to the Knowledge Society, published in 2005, states that: the spread of new technologies and the emergence of the Internet as a common access network around the world provide new opportunities to expand common space and knowledge; has been shown to have radically changed the place of knowledge in society. According to UNESCO, the digital economy is an economy based on conditions in which information not only has social and economic value, but also requires an information market in which information can be exchanged. It is about the income that these market participants can earn. In each particular country, the digital economy is formed individually and has the character of a global formation. Therefore, the concept of digital economy is very complex and means "act locally - think globally".
“information” in the current development environment, as the concept of “information economy” is secondary to the concept of “information”; 2) the basis for the formation of the existing digital economy of the country is the existence of a full-fledged information market.

In 1995, he noted the disadvantages of classic products (weight, raw materials, transportation) and the advantages of the digital economy (lack of weight of goods, virtuality, almost unnecessary raw materials, rapid global movement) [7].

The formation of a conceptual whole of the digital economy allows us to distinguish three main stages of its general theory (Table 1):

<table>
<thead>
<tr>
<th>№</th>
<th>Periodic stage</th>
<th>Directions of development of the theory of digital economy</th>
<th>Contributing scientists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1960–1970 years</td>
<td>The birth of the theory of digital economy is, first of all, the theories of post-industrial society, formed on the basis of understanding the accumulated practical material, identifying patterns and trends in the development of this process</td>
<td>F. Maxlup, L. Klyaynpokk, M. Popat et al</td>
</tr>
<tr>
<td>2</td>
<td>1980–2000 years</td>
<td>The era of rapid informatization of the economies of advanced countries, which contributed to the formation of the basic principles of the theory of digital economy</td>
<td>X. Dopdik, Dj. Vang, P. Katts, V. Macuda, Dj. Ctiglep, T. Ctounep, K. Eppou et al</td>
</tr>
</tbody>
</table>

The results of the study show that an approach that takes into account the specific weight of the institutional components of the digital economy (the share of e-commerce in total trade, the share of e-services in total public services, the share of freelancers in total employment, etc.) is effective. Such a system of relationships plays an important role in interconnecting the key components of the digital economy and reveals new aspects of the digital economy (Fig. 1).
Fig. 1. The system of relations of its institutional components in the development of the digital economy. The formation of the digital economy can be distinguished a number of its mechanisms: laws, legal documents; government agencies, organizations, ministries and departments; market mechanism (information, information technology market, price, competition); entrepreneurship; service; innovation; blockchain; communications. The main components of the digital economy are: e-government; electronic commerce; electronic employment; technological infrastructure; digital processes - processes that ensure the success of the business (electronic banking, electronic payments, Internet advertising, electronic currency) can be included [8]. In turn, we can see through the conceptual model of the structure of the digital economy that the components and mechanisms of the digital economy are interrelated. It should be noted that this conceptual model is the methodological basis of this research and is proposed by the author as a logical basis for solving problems of formation and improvement of digital economy models for professionals and researchers in the field of digital economy (Fig. 2).
**STRUCTURAL CHANGES / EFFECTS**

**Macro degree**
- Economic structures
- Structural changes:
  - intangible sector (services);
  - sectoral economy (platform-based);
  - other structural changes.

**Institutions**
- Development strategies;
- Environment;
- Sustainable social norms;
- Other institutional changes.

**Organizational changes**
- Improvement of processes;
- Business models.

**Consumption**
- Process improvement;
- Strategic changes in demand.

**Micro degree**
- Technological developments:
  - Process improvement;
  - Outsourcing;
  - Mutual substitution;
  - Other technological developments.

**Columns of the digital economy system**

*Basic infrastructure*
- Roads;
- Transport system;
- Power supply;
- Water supply, etc.

*Digital infrastructure*
- Mobile networks;
- Fiber optic lines;
- Internet coverage;
- Data storage capacity;
- Delivery of digital services to citizens.

*Environmental factors*
- Legal and regulatory documents;
- Political factor;
- Investments;
- Approval by civil society;
- Financial instruments.

*Technological factors*
- Primary:
  - Cyber security;
  - Cloud technologies;
  - Big data analysis;
  - Artificial intelligence.
- Term:
  - Blockchain;
  - Internet of Things;
  - 3D printer;
- Prospective:
  - Biotechnology;
  - Robototechnics;
  - Energy supply.

*Human capital development*
- Staff training;
- Creation of knowledge (research, projects, developments);
- Commercialization of knowledge.

---

**Fig. 2.** Conceptual model of digital economy formation.
4 Conclusion

In conclusion,

a) All the theories discussed point out that digital technologies are to some extent the foundation of the digital economy. In general, theories of the type of digital economy are based on various theoretical developments of individual authors, and the results of the analysis show that today the digital economy is not sufficiently fully studied, which requires extensive research;
b) Although the indicators of the digital economy in the world are different and the paths of development are different, it can be noted that it creates favorable conditions for active innovation, significantly increases the cost of investing in digital technologies and infrastructure;
c) The digital sector of the economy relies to some extent on the components that are the pillars of the digital economy, and the digital economy, in turn, interacts through its mechanisms, components, creating a conceptual model of formation.

References