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**INNOVATIVE DEVELOPMENT OF VIRTUAL MANAGEMENT IN CONDITIONS OF TRANSITION TO THE INFORMATION SOCIETY**

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**SUMMARY**

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**INTRODUCTION**

**The relevance of the research topic.** In the twenty-first century, civilization has entered the information age, characterized by the appearance of new information and communication technologies, globalization of social processes, and the reorientation of the world economy from raw material to innovative. If ten years ago only 361 million people had access to the Internet, now this figure has exceeded 2 billion, and e-commerce turnover has grown to a trillion dollars. These statistics eloquently show that countries that underestimate the potential of information and computer technologies may lose their global positions under the pressure of competing countries that are more able to adapt to the new realities. For those, who have realized the potential of the information society, the global market opens up great perspectives.

The fact that Ukraine is behind in preparing to enter the information society can lead to enormous economic and social losses as well as to the loss of information sovereignty of the country. Therefore, in accordance with the indicators of an approved information society's development strategy in Ukraine, the volume of investments for the use of information and telecommunication technologies should increase not less than 2, 5 times.

The development of information technologies leads to a radical reorganization of the management systems, creating objective opportunities for the formation and development of networking, virtual structures in various spheres of public life, including politics, economics, science, education, based on the principles of cooperation of independent enterprises, territorially and distribution of their activities in an integrated information space.

However, despite a large number of publications on this topic, they are devoted mainly to the decision of some individual problems of virtual management and are generalizing. The lack of the theoretical and practical aspects of virtual management in the conditions of the formation of the information society in Ukraine allows considering the topic of this master's thesis relevant and practically significant.

**Analysis of the latest scientific research and publications.** Various aspects of the theory and practice of virtual management have been reflected in numerous works of Ukrainian and foreign researchers.

The most significant contribution to the study of the problems of functioning and development of virtual organizations contributed to Shapiro V. D. et al, as well as foreign researchers Bell D., Berg A.I., Bode D., Weber F., Gibson J. JI., Drucker P ., Castells M., Kunz G., Machlup F., Milgrom P., Rice M., Riis A., Roberts G., Tofler O., Fukuyama F., Hanamar X., Emerson H., Arrow K., Ashby R.

Among Ukrainian scientists who develop issues of information technologies on the management system, it is necessary to note works Boychenko K., Dzyundyuk B., Zagorna T., Mudrak L., Podchalova T., Thanasichuk V., and others.

Problems of virtual management cover a number of industries: political, social, economic, managerial, technical. According to this fact, the study of the prospects for innovative development of technologies in public administration and business is becoming increasingly relevant, both from scientific and practical points of view. These circumstances have determined the goal and specific research tasks of this master’s thesis.

**Aim and objectives of the thesis.** The purpose of this master's thesis is the theoretical and methodological definition of the concept of virtual management, as well as its innovative development in the conditions of the formation of the information society in Ukraine on the basis of analysis of the current functioning of virtual organizations in business and government areas.

List of objectives to be reviewed and analyzed to reach the aim of the thesis:

- to identify the preconditions and patterns of change in the paradigm of management in conditions of formation of the information society;

- to find out theoretical foundations and basic principles of virtual administration;

- to clarify the concept of "virtual organization" as a new organizational form of the information economy, consider the peculiarities of its construction, functioning, and management in business and public administration;

- to analyze world trends in the formation and development of the information environment in society and the economy;

- to determine the role and meaning of the state in Ukraine's entry into the information society;

- to generalize the experience of creating and functioning of national virtual enterprises, as well as the practice of applying remote technologies in the system of public administration;

- to review innovative approaches to the design of virtual business structures;

- to determine the main features, functions, and elements of the innovative culture of virtual management and propose the ways to form it in modern conditions;

- to develop a method for assessing the effectiveness of information and communication infrastructure of state and municipal management.

**Research object** - virtual enterprises and state, municipal institutions that are using information and communication management technologies.

**Research subject** - a set of economic, organizational, and managerial relations occurring in the system of virtual management in the conditions of innovative development and informatization of modern society.

**Selected research methods.** The theoretical and methodological basis of the research work is the fundamental scientific concepts and publications of Ukrainian and foreign scientists engaged in the study of the information economy and the virtual organization.

**Scientific novelty.** The scientific novelty of this master's thesis is in defining the conceptual foundations of virtual administration and determining the innovative ways of its development in the conditions of globalization and informatization of society.

**Practical significance of the obtained results.** The author's main points, recommendations, and proposals develop and complement a number of significant aspects of management theory. The theoretical significance of the research work is in defining a complex approach to the study of virtual organizations, identifying specific functions and principles of virtual management. The practical significance of this thesis is the possibility of using the proposed concept in the development of strategic management of virtual organizations. The conclusions and proposals formulated in this work could be used for further research on the functioning of virtual organizations, as well applied during the teaching of these Disciplines "Management Theory", "Strategic Management", "Innovative Management".

**Structure.** The graduate qualification thesis consists of an introduction, three chapters with conclusions, a summary of the research work, and a list of sources used.

**CHAPTER 1**

**THEORETICAL AND METHODOLOGICAL FOUNDATIONS OF VIRTUAL MANAGEMENT**

* 1. **Transformation of the management paradigm in the conditions of formation of the information society**

In modern science, the information society is considered as a new stage of the evolution of human civilization, a new phase of social development, in which the information sector of the economy significantly affects the development of both the world community and individual countries.

It should be noted that the idea of ​​information society was formulated in the late 60's - the early '70s of the XX century. The term "informational society" introduced Y. Hayashi, Professor of the Tokyo Technological Institute [6]. The contours of the information society were first presented in the reports of a number of organizations of the Japanese government, that describe the computerization of social processes, which allows all social groups to access sources of information, lowers the level of people's routine work by ensuring a high level of production automation as the main condition on a way to transition to the information society.

The information society is proclaimed the most progressive form of the organization of people's life by most theorists. Moreover, some researchers consider an informational society as a synonym of post-industrial society while others believe that the information society is only one of many kinds of post-industrial society. Many see the information society as one of the stages of the development of post-industrial society. And some - output information society beyond the post-industrial framework, presenting it as a new stage of social progress, which goes to change the post-industrial society.

According to the American sociologist D. Bell, the term "information society" reflects a new name of the post-industrial society, where information is the basis of the social structure. "... crucial importance for economic and social life, for methods of producing knowledge, as well as for the nature of human labor, becomes the formation of a new social contribution based on telecommunications" [2].

Summing up different points of view, we consider information society as a new phase of social development, where the information sector of the economy significantly affects the development of both the world community and individual countries. This social structure is mainly characterized by the high speed of communication processes, which is provided by high-tech technologies (microprocessor technologies and computer networks, Internet), and where information and knowledge acquire new quality by becoming the main products of life of individuals and social groups.

Under the high influence of the Internet, a large number of works describing the technological or informational and communication component of social development (for example, Technotronic society) appeared at the beginning of the new Millenium.

The prevailing technocratic determinism indeed is very notable in the works devoted to the information. In our opinion, an alternative to it can be looking at the process of influencing the information sphere on the life of society in terms of the institutional approach to the analysis of socio-economic processes of transformation of modern society.

The management paradigm is simultaneously the theory of management with its concepts, as well as the concept for raising problems and solutions in management.

In the last decade of the XX century and the beginning of the XXI century, the world business community was talking about the birth of a new management paradigm associated with the development of information technologies, the emergence of the Internet. Informatization of society is fundamentally changing the appearance of modern and future organizations, as well as management requirements. We cannot but agree with those specialists who called this a network or information paradigm.

The new information concept of management objectively required the introduction to the scientific circulation of new categories that have their specific socio-economic content, the scope of application, and, also reveal new approaches to improving organizations' management.

The main feature of the modern information management paradigm is that the main resource of the development of society and the economy is information and knowledge, and the maturity of information technologies determines the pace of this development. Therefore, within the framework of this paradigm of the enterprises are considered as knowledge-oriented corporations and information, whose boundaries become uncertain, since knowledge and information are mastered and transmitted to the virtual level with active use of information technologies. In practice, managers of many companies have realized that the true Internet value lies in the capabilities that the network opens to improve business processes, reduce total costs, and increase profit. That is, the network has really provided new, rich perspectives for essential transformations of business processes.

Consequently, the development of organizational changes in the new information economy is characterized by the following significant tendencies:

1. Transition from mass production to flexible;
2. Crisis of large corporations and life stability of small and medium-sized businesses as investment agents and sources of creation of new jobs;
3. Development of new methods of management;
4. Organization of inter-organization network;
5. Corporate strategic alliances;
6. Horizontal corporations and global business networks;
7. Information technologies and network enterprises;
8. Multinational enterprises

The growth of computer system performance and improvement of network technologies led to the formation of a new type of economic activity - e-business as a special form of business, which is implemented to a large extent by introducing information technologies in the processes of production, sale, and distribution of goods and services.

Electronic business as a new form of business arose on the foundation of restructured enterprises and firms. Global communication networks, such as the Internet and intranet, contributed to the formation of new virtual structures, which includes the list of characteristics:

* reduction of information deficit and increase the efficiency of its use;
* intensification of processes of accumulation and movement of knowledge;
* establishment of a high level of trust;
* intensification of cooperative interconnections between partner firms, etc. But at the same time, the two groups of risks occurred in virtual enterprises:

1. Technological risk - a possible low-quality connection of the provider, internal database attack with subsequent leakage of confidential information, etc;
2. Business risk - the risk of inconsistencies of the supplied product, the risk of the buyer of pre-paid cash agreement, risk of non-payment or overdue payment, risk reduction of profit norms for suppliers and buyers.

The following models of interaction of market participants are distinguished in electronic (virtual) business today:

* **B2B** (business-to-business) - legal entities (enterprises and organizations), which sell goods to each other are subjects of market operations ;
* **B2C** (business-to-consumer) - the subjects of market operations are a legal entity (a company or organization) as a seller and an individual as a buyer. Organizations sell goods and services to individual consumers and households;
* **C2C** (consumer-to-consumer) - consumers directly communicate with each other and sell each other goods and services;
* **C2G** (consumer/citizen-to-government) - public authorities and administrative structures provide legal entities and citizens necessary services and information (second name: E-Government - organization of public administration on the basis of electronic means of processing, transferring, and disseminating information. C2G operations usually include tax payment, issuance of certificates or other documents, etc);
* **B2G** (business-to-government) - an interaction of business and state or administrative structures, ranging from local authorities and ending with international organizations.

Such a division is rather conditional, and it is done, on the one hand, to obtain academic completeness of the whole picture, and on the other hand, the functioning of most of these models requires special organizational decisions.

But you can say without exaggeration that today the Internet becomes a great environment for active business including:

1. financial operations in an interactive mode: banking and insurance transactions, interactive investment, speculative operations with currency and liquid securities;
2. e-commerce markets, information trade products, tourism products;
3. markets of mobile trading through trading machines and market services.

Thus, the tendencies of informatization of society influenced the search for new forms of organization and management of the enterprise to a large extent, led to a change in traditional ideas about the boundaries of enterprises, branches, and the need for a new look at business process management. Virtual business structures can quickly adapt to market changes due to higher flexibility and transform into new structures, while forming the level of competence, which is necessary for the organization of production and services, depending on the needs of the market.

It is important to emphasize that since the late 1990s, the concept of information society began to be actively applied not only in business but also in social practice and projects aimed at introducing information and computer technologies in various spheres of society. Thus, in the conditions of an information economy, there is a rethinking of the role and meaning of the state which is to solve the task of coordinating multidirectional processes both administrative and market in modern society. Information becomes a key resource of state power and the effectiveness of state administration largely depends on the ability to control and guide it in the right direction. Therefore, an integral part of the information society is the introduction of information and computer technologies into a public administration system.

The confirmation of this was signed in 2000 "Okinawa Charter of Global Information Society", where the leaders of States included in G-8 have identified the readiness for implementation in their programs aimed at developing an information society and the elimination of information inequality.

The key form of information aspect of state activity is an electronic state (in the media more often there is a term "electronic government"). Electronic State (Electronic Government) is an organization of public administration on the basis of electronic means of processing, transferring, and disseminating information, providing services to the state authorities of all branches of power to all categories of citizens (pensioners, workers, businessmen, civil servants, etc.) by electronic means, informing the same means citizens about the work of state bodies.

**1.2. Features of managing virtual organizations as subjects of the information society**

Recognition of virtual organizations as a new organizational form of information society requires the scientific establishment of the features and characteristics of this category, which will further formulate the basic theoretical and methodological provisions of the concept of virtual management.

Recently, the problems of virtual organizations are actively discussed in the scientific literature and media. Unfortunately, there is still no clear definition of a virtual organization. Some authors define a virtual organization as a networked, computer-mediated organizational structure consisting of many interacting agents located in different places. Other experts believe that the creation of a virtual enterprise is associated with the intelligent modeling of the interaction of complex, heterogeneous, distant agents.

Thus, in modern conditions, the virtual organization as a complex, innovative, dynamic system requires a comprehensive understanding of the management aspects of its creation and operation.

First of all, we consider a *virtual organization as a cooperative network of enterprises (organizations, individual teams and people) with key competencies for the best execution of a market order based on a single information system.*

The space of virtualization of enterprises includes three main categories of phenomena:

1. *virtual market* - the market of goods and services, which exists on the basis of communication and information capabilities of global networks (Internet). Virtual purchases, banking operations, training, virtual fairs, virtual publishing houses, e-commerce, etc. are carried out in this market space.
2. *virtual reality -* reflection and imitation of real developments and production in cyberspace, which is both a tool and an environment. As a tool, virtual reality allows you to intuitively build complex structures as an environment - allows you to mentally imagine the product, buildings, jobs, machinery, and equipment before they find real existence.
3. *Virtual (network) organizational forms -* are the unification into a single network of individual employees with the help of modern information and communication technologies. This system covers a wide range of work at home and work using telecommunications, as well as work using knowledge banks or knowledge networks. When creating a virtual network company, the resources of its members are pooled, regardless of the territorial boundaries and the degree of remoteness of organizations from each other. Businesses are given the opportunity to expand their resource potential without losing flexibility.

That is, a virtual enterprise is basically a joint property and a strategic alliance that brings together the specific goals and coordinated efforts of all its member organizations. The basic goal of a virtual corporation is to combine technology and competencies in order to most fully meet the demand in the consumer market.

When forming the management system of a virtual enterprise it is necessary to take into account the features of virtual organizations, namely: the non-permanent nature of operation; implementation of communications and management actions on the basis of integrated and local information systems and telecommunications; relationships with all partner and other interested organizations through a series of agreements, contracts and mutual ownership of the property; formation of temporary alliances of organizations in related fields; partial integration with the parent company and preservation of joint ownership relations as long as it is considered profitable; contractual relations of employees with the administration at all levels.

In modern virtual management there are three main types of virtual organizations:

1. With a centralized type of management, where "agents" act on behalf of their organizations, and one of the "agents" manages the process: gives tasks to other "agents", summarizes the results, and makes decisions. A centralized virtual organization is based on the idea of ​​an expanded organization, where there is one central coordinator and peripheral coordinator, which are entrusted with a number of functions. Such a structure may arise as an embodiment of an outsourcing strategy - the allocation of secondary production functions by the enterprise and their transfer to external organizations.
2. With a distributed type of management, where knowledge and resources are shared between "agents". It has a common command management body that makes decisions in conflict situations. The main feature of such an organization is to gradually reduce the number of tasks due to internal factors of the enterprise and shift to the fullest satisfaction of the interests of the customer.
3. With a decentralized type of management, in which all management processes are carried out only through local interactions between "agents". A decentralized virtual enterprise is usually formed around a complex, unique project that none of the partners can complete on their own.

In addition to the classification proposed above, virtual business structures by their organizational design can be divided into stable and dynamic business systems.

Stable business systems can be represented by both individual companies and a group of companies united by long-term relationships with external suppliers.

Dynamic business systems are represented by alliances of entrepreneurs or companies, each of which has key technology and a high level of competence. Temporary alliances are usually organized around a leading firm. Each of the partners of this group has independence, and cooperation is carried out on the basis of a specific project, for the implementation of which a basic competence is created, which allows to implement the project in the shortest possible time and market a product or service according to consumer demands. Upon completion of the project, the life cycle of the dynamic alliance can be completed.

Technologies play a key role in the formation of virtual organizations. Types of technologies can be divided into several classes.

1. Communication technologies. The basis of most virtual organizations is the Internet and more modern broadband technologies. In addition, other technologies are used to operate organizations, such as the Intranet. A "web" that connects different nodes of the organization and allows, firstly, to maintain contacts, coordinate and control the work from the head office, and, secondly, allows remote employees to work and add value to the company's services and products is formed from communication links.

1. Information storage technologies, such as databases or data archives, are another essential feature of virtual organizations that facilitate the storage of acquired or created information and knowledge.
2. Monitoring and scanning technologies are designed to study the environment in which the organization operates, in order to collect and evaluate information. Such data collection technologies are especially important for the implementation of the "feedback loop".
3. Analytical technologies are designed to analyze data sets and provide information in a cataloged form.
4. Modeling technologies are not yet very popular. They can be used for different purposes, but their main goal is to help managers model different scenarios of the business environment and markets.
5. Design technology is a field of modeling technology designed for testing and analyzing the development of a new product in virtual space before building a real prototype.
6. Production technologies are increasingly gaining virtual space through robotic systems, especially in the case of hazardous and harmful industries.
7. Technologies of delivery of services to clients by means of technological channels. E-commerce is also an important innovation e.g for booking plane tickets with software funded by various airlines, such as East Jet (UK).
8. Combinations of different types of technological systems exist in the form of systems that may consist of one, two, three, or more types of technologies. In turn, most organizations - and almost all virtual organizations - use combinations of different types.

The management process of creating a virtual organization (VO) can be represented as the implementation of the following stages:

* 1. Selection of VO and its potential participants.
  2. Identification of VO.
  3. Formation of a single information space.
  4. Formalization of competencies.
  5. Distribution of roles in the structure of VO.
  6. Differentiation of statuses of network members.
  7. Formation of an environment of trust in the network of VO participants.
  8. Structuring information flows.

The analysis above allows to determine the distinctive characteristics of the management system of virtual business structures:

1. unified goal: a general view of values ​​and goals;
2. independence of team members;
3. voluntary relationship, which is expressed in the voluntary association of partnerships, the establishment of a high level of trust;
4. reducing the deficit of information and increasing the efficiency of its use;
5. activation of processes of accumulation and transfer of knowledge;
6. intensification of cooperative relations between partner firms, etc .;
7. rapid adaptation to market changes and the ability to transform into new structures;
8. number of leaders: in this case, the system as a whole has more flexibility;
9. multilevel.

Summarizing the main provisions of the management system of virtual organizations, it is necessary to formulate their problems, namely:

* redundancy of communications;
* the complexity of forming a network of participants in a virtual enterprise and online contracting;
* the complexity of decision-making with a large number of equal participants;
* distrust of potential participants of the virtual enterprise;
* instability of the network of participants of the virtual enterprise, the possibility of exit of any of the participants;
* difficulty with reallocating resources within the network of participants.

Unlike traditional organizations, organizations that exist in cyberspace are characterized by small physical means and are often dispersed. These are usually "young" companies, whose strength lies in the growing ability to be creative and flexible. Management tends more towards a horizontal leadership style than a vertical one. Data is less than knowledge. However, the lack of physical structure and geographical localization creates some problems. One of them is motivation: the flexibility of virtual organizations is perceived by many people as instability, and this can create obstacles. Investors who do not like to take risks do not always feel that they are investing in something material, and employees feel less protected. Whereas many people are happy from feeling like mobile workers or managers when the opportunity arises.

**1.3. World experience of forming the information environment in society**

At the beginning of the 21st century, all the advanced countries of the world are experiencing a transition from an industrial society, based on the rigid division of labor, mass production, and exchange of material products to a post-industrial society in which the computer means and telecommunications play a major role. Human capital becomes the main area of ​​accumulation and use of investment.

Nowadays all leading countries that use information technology in the national interest are developing and operating government programs to enter the global information society. These programs contain answers to three main questions:

1. the purpose of creating an information society in the country;
2. identification of means and ways to achieve this goal, aimed at expanding the scope of information technology, simplifying access to information, creating political, economic, cultural, and legal conditions that contribute to strengthening the uniformity of the national information space;
3. distribution of political, economic, financial, and organizational roles and responsibilities between the participants - the state, society, business.

The need to reform the civil service in many countries around the world, including Ukraine, is due to a variety of common problems, which became especially acute at the end of the twentieth century.

The issues of public administration reformation heavily rely on the concept of "New Public Management". The phenomenon of the new state management arose within the broader movement for "government restructuring" (end of the twentieth century) D. Osborne and T. Gebler, the authors of the concept "Reinventing Government" proposed the principles of Reinventing Government not in the form of any standards, but as a generalization of changes in public administration. The basic principles are set out as follows:

- the state is not seen as an inevitable evil, but as a way of collective action and solving social problems;

- an effective state must meet the requirements of the information society and knowledge economy;

- a large, centralized, and standardized bureaucracy must be a thing of the past;

- the problem of public administration is not people (bureaucrats), but the bureaucratic system itself;

- traditional democracy will not be able to solve today's problems of the state by redistribution of funds;

- the effectiveness of decisions depends on the "reinvention" of the government;

- it is necessary to be based on the principles of ensuring equal opportunities for all citizens.

Modern beliefs of public administration reform include the concept of e-government, among other elements, which usually encompasses the operational (or executive) component of government activity in terms of its own functioning and its interaction with the citizens.

Denmark, South Korea, Estonia, Finland, and Australia are the leaders in the ranking of e-government development. Ukraine ranked 69th in the ranking of the most e-government-ready countries in 2020, which is 13 positions higher than in the previous ranking in 2018.

In addition, in the ranking of countries with the most developed electronic participation of citizens in communication with the state, Ukraine ranked 46th, which is 29 positions higher than the 2018 ranking.

The idea of ​​actively using new information and communication technologies to increase the efficiency of government emerged in the United States during the implementation of administrative reforms based on the ideology of the new state management in the early 1990s. Currently, the US federal government pays special attention to e-commerce in the public sector, competitive e-bidding for the supply of goods and services to meet government needs; public access to government and administrative information; use of smart cards; solving various tasks, including obtaining official documents through government websites, paying taxes, providing statistical information about the work of the state apparatus to the population, etc.

Another example of the state's Western political strategy in the field of formation and functioning of e-government is the situation in Canada. This state was one of the first in the world to address the problem of open access of citizens to information from government agencies. Today, Canada has gone through a full cycle of public e-government policy development from problem identification to public policy evaluation and regulation. Canada is now one of the world leaders in the use of information and communication technologies and has the most developed e-government.

Of course, the interesting experience of Singapore, which despite the authoritarian political regime in combination with the principles of rational bureaucracy in public administration, is among the leaders in the field of e-government projects, second only to Canada. Singapore has long established itself as a country that has achieved outstanding success in the field of informatization and implementation of information and communication technologies in the daily lives of citizens. Thus, one of the main programs of e-government - the portal "Electronic Citizen" (www.ecitizen.gov.sg) has become a classic example of a problem-oriented information resource of national rank. With its help, every resident of Singapore can not only get information about a government agency but also make a cycle of vital operations that traditionally require a lot of time and repeated visits to official bodies. The undoubted advantage of this portal is that citizens in the course of interaction with government agencies do not need to know about their location, or mode of operation, or the "physical nature" of the operation to be performed.

The European approach to the development of the "E-government" is largely based on the basic principles of macroeconomic policy of the European Union in the field of the information society, stated in the program "Electronic Europe":

* promoting the expansion of public access to modern information and communication technologies by creating access centers (libraries, schools, etc.);
* expanding the range of social services provided in electronic form and increasing their availability;
* introduction of information society technologies into the state system of education and retraining;
* conducting research in the field of social consequences caused by the spread of information and communication technologies, and opportunities for adaptation of all categories of citizens to new living conditions;
* raising the level of public awareness of the possibilities of information and communication technologies (while public authorities should lead in the use of electronic technologies in their daily activities, thereby stimulating the acceleration of information development of society as a whole);
* promoting the process of standardization of information systems to ensure network compatibility, as well as the provision of network interactive services;
* control over the development of relevant legislation and compliance with legal guarantees of citizens and businesses.

An important factor that distinguishes the European model is the desire to carefully take into account the socio-cultural and linguistic diversity of society when creating e-government systems. In particular, we can list 20 basic public services, the implementation of which is monitored at the level of the European Union as one of the indicators of the progress of individual countries in the field of "e-government".

**Chapter 1: Conclusion**

Summarizing the information above, we can conclude that in the transition to the information society is the transformation of the management paradigm as a real response to the challenge of time. The network (information) management paradigm is based on the fact that information and knowledge become in the information age a strategic resource of society, comparable in value to natural, human, and financial resources, and the Internet serves as the main environment for active business and government. The new network paradigm corresponds to the rapid and sometimes unpredictable changes in the external environment, allowing you to quickly adapt to the ever-changing conditions of the information society.

The characteristic features of the modern information management model include: constructive interaction of three subjects of information transformation: the state, business and individuals (social groups); striving for social, political, informational economic and structural uniformity of the national information public space; expansion of educational opportunities; reorientation of the economy and society from raw materials to innovative, knowledge-intensive nature of development; business via the Internet becomes global regardless of the size of companies, their geographical location and nationality; introduction of information and communication technologies, which provides acceleration of information and knowledge flows inside and outside the company; elaboration and detailed analysis of the information policy of the state, which reveals the way of using the available information flows and resources by various institutions (for example, the state, organizations, individuals and social groups that may have their own ideas and interests when working with information); reducing the number of management levels, which leads to faster response to change and cost reduction; maintaining numerous links with external organizations, which is a source of lasting synergy effects; constant search for innovations, increase of resources allocated for the development of knowledge, innovations that support and strengthen competitiveness within not only the domestic but also the international market. It is no exaggeration to say that the Internet is becoming an environment for active business, the development of the information society.

Trends in the informatization of society have greatly influenced the search for new forms of organization and management of the enterprise and led to a change in traditional ideas about the boundaries of enterprises, industries and the need for a new perspective on business process management. Under the new paradigm, business enterprises are seen as networked and virtual corporations focused on knowledge, information, the boundaries of which become uncertain.

The analysis of the international practice of information space formation in society shows that the information paradigm in public administration involves the formation of e-government as a new type of government structure, where management is carried out through a system of information technology and communications and a new system of functional representation. In the implementation of state strategies for the development of the information society in the most developed countries (USA, South Korea, UK), we can identify some common features and approaches: ensuring the right and technical capacity to access information and information resources for the whole population; observance of freedom of speech; protection of the interests of national minorities, the next generation in the information sphere; protection of national cultural heritage, language, opposition to cultural expansion of other countries; information security; protection of intellectual property, fight against piracy; fight against computer and high-tech crimes; control over the use of information and telecommunication technologies in government agencies; censorship in global computer networks; the priority of ensuring the transparency of the information resource and the development of interactive services for the provision of public services.

The modern process of informatization of society affects not only the interests of government agencies, but also the entire civil society, and therefore requires the joint participation and cooperation of all stakeholders, based on trust and mutual responsibility.

**CHAPTER 2**

**CURRENT TRENDS OF VIRTUALIZATION OF UKRAINIAN SOCIETY. ТHE PROBLEMS AND PROSPECTS**

**2.1. The role of the state in creating an information society in Ukraine**

Ukraine, like many countries around the world, demonstrates consistent and steady progress in building an information society in recent years. In Ukraine, Information society technologies started to develop not as a result of the consistent transformation of industrial society into post-industrial (information), but as responses to the challenges of modern socio-economic development of our country. Ukraine was one of the leading countries in the dynamics of growth of the Internet audience. The number of Internet users in Ukraine is 22.9 million people. This is stated in a study by Factum Group for the Internet Association of Ukraine for the third quarter of 2019. For the first time in three years, the number of Internet users increased by 7% - to a total of 71%. "One of the reasons for this growth is the" digitalization" of the population. Today, 22% of users access the Internet exclusively with the help of smartphones, "the study said. In particular, the number of Internet users in villages and cities with a population increased to 100,000. 65% of Ukrainians have the Internet at home. According to the study, almost the entire population of Ukraine under the age of 35 is an Internet user [35].

While the modern Russian economy is not informational, otherwise most of its GDP would be provided by the production, processing, storage, and dissemination of information and knowledge with the participation of more than half of those employed. Ukraine ranks 56th in the world in terms of information technology development (2016; World Economic Forum in its sixth annual report). In the previous ranking, Ukraine ranked 71st. The only competitive advantage that Ukraine has in this aspect is a strong IT staff, i.e. Ukraine has a very high level of training of programmers. Ukraine is one of the world's centers of offshore programming [40].

It should be noted that today the IT sector is one of the most dynamic segments of the Ukrainian economy, which is actively developing. Despite the long stagnation of the Ukrainian economy, the export of IT services in

Ukraine in 2017 grew by 20% and amounted to 3.6 billion dollars. According to experts, if the industry is not hindered from developing, then by 2020 it may grow 1.7 times. Tax revenues from the IT sector to the state budget in 2017 increased by 38% compared to the previous year and amounted to UAH 7.8 billion. Information technologies confidently occupy the third position in terms of export earnings, lagging only behind agribusiness and metallurgy. The contribution of the IT market to the economy in 2017 amounted to about 4% of GDP, and in the coming years will continue to grow [47].

Effective implementation of modern information technologies, the creation of a single information space for a particular region and for the country as a whole can not but involve the solution of legal, organizational, and many other issues. The main responsibility in solving the strategic tasks of creating an information society inevitably falls on the state. In its turn, it requires a restructuring of the state bodies responsible for the formation and implementation of information and telecommunications policy.

Ukraine and the EU have signed a joint statement on cooperation in the field of the information society. Ukraine has the opportunity to participate directly in specific projects of the Fifth Framework Program of the European Commission aimed at the development of the information society.

When considering the formation of the information society in Ukraine, it is important to draw conclusions that reflect the specifics of the development of Ukrainian society. The place concerning information and its role in Ukrainian society deserves special attention. Ukraine has its own specifics, which lies in the low social significance of information, which is expressed in the information passivity of citizens. Departmental secrecy was a major feature of the Soviet information environment, and for many years there was a regime of secrecy that created a deep-rooted communication barrier, a reluctance to share information.

Other obstacles include economic instability; insufficient legal support; low information and legal culture of society as a whole; insufficient development and inefficiency of information infrastructure; lag in the field of information technology and the development of computer technology; insufficient financial support for research in the field of informatization.

Thus, the formation of the information society is associated with a long period of time and purposeful efforts to modify the current state.

Further development of "digital transformations" in Ukraine will take place in one of two scenarios - basic or forced. The baseline scenario, or non-priority, envisages the inertial continuation of the trend of perception of "digitalization" of the economy and the related development of human capital as non-priority, which will further lead to labor migration and brain drain, inefficient economy, low competitiveness. This scenario will have only a minor impact on the modernization of the economy, the development of the innovation market, innovative entrepreneurship, and the general state of "digitalization" of the country.

The priority scenario of digitalization involves the removal of legislative, institutional, fiscal, tax, currency, and monetary barriers that hinder the development of the "digital" economy. To implement this scenario, the document "Digital Program of Ukraine 2020" was developed, which sets out the principles of Ukraine's development in the digital space: the development of digital infrastructure as the basis of the digital economy; digitalization of the real sector, in particular, through the promotion of infrastructure "Industry 4.0", "digital workplace", "smart factories"; digitization of basic spheres of life, including through the digital transformation of high school and the development of STEM-education, the introduction of e-medicine and e-security, the concept of "smart city"; development of digital literacy of the population. The main motivation for the state to comply with the scenario of accelerated development should be digital dividends, namely: national economic growth, economic acceleration, entrepreneurship, and hence tax revenues, GDP growth, inflows of new investment [41].

Three main directions of updating approaches to information policy were identified, in particular:

- media law as an important basis for the development of the information society;

- information policy on the development and protection of a nationally defined Internet environment;

- media education for all age groups without exception as potential participants in the information society.

These areas are partially reflected in the Strategy for the Development of the Information Society in Ukraine approved by the government on May 15, 2013 [32]. This strategy defined the purpose, main principles, strategic goals of information society development in Ukraine, tasks aimed at achieving them, as well as the main directions, stages, and mechanism of implementation of this Strategy, taking into account current trends and features of Ukraine's development.

At the second meeting of the Interdepartmental Commission on Information Policy and Information Security under the National Security and Defense Council of Ukraine, it was proposed to launch a long-term program under the conditional "Electronic Ukraine". at all levels, the introduction of electronic document management and information security. It is about creating an electronic environment in a country where its citizens will be able to effectively carry out all their usual relationships with the outside world - to work, communicate, interact with government agencies, etc. [34].

The introduction and development of e-government are among the main tools for achieving transparency in the activities of government bodies at all levels, increasing public confidence in government, as well as more effective public administration.

The concept of "e-government" is defined by the "Concept of e-government in Ukraine" as a form of public administration that promotes efficiency, openness, and transparency of public authorities and local governments using information and telecommunications technologies to form a new type of state, oriented to meet the needs of citizens "[32].

It should be noted that the Order of the Cabinet of Ministers of Ukraine dated 20.09.2017 No. 649-r approved the Concept of e-government development in Ukraine, which aims to support coordination and cooperation of public authorities and local governments to achieve the necessary the level of efficiency and effectiveness of e-government development, promoting the idea of ​​public administration reform and decentralization based on the widespread use of modern information and communication technologies throughout the country, as well as to promote the priorities identified in the Sustainable Development Strategy [32].

Regarding the practical implementation of the target program "Electronic Ukraine" can be evidenced by the fact that today among enterprises there are actively developing the basic mechanisms of online corporate sales, the same as in global business, according to experts. These include CRM (Customer Relationship Management); e-procurement (electronic supply systems); marketplace (online stock trading); direct sales; SCM (Supply Chain Management). For example, with the help of some mechanisms the relations between enterprises are optimized (e-procurement, marketplace), with the help of others - internal processes of the enterprise (CRM), with the help of the third - the activity of several enterprises (SCM).

The most common form of use of Internet technologies in the operation of Internet sites by a business entity. The total number of Internet sites in the world is more than 1.24 billion websites. And continues to grow. Websites in Ukrainian make up about 0.2% of the global network, so UA.net is one of the 30 most common language segments on the Internet.

The level of integration of Ukraine into the information society can be judged by a number of indicators:

* the existence of the concept of state information policy;
* development of legal support for the transition to the information society;
* development of information and communication infrastructure;
* the wealth of information resources;
* information market development;
* international cooperation in the field of information;
* awareness and use by the general public of the benefits of the information age;
* training of specialists for the information sphere.

Thus, such factors of socio-economic, scientific, technical, and cultural development have been formed over the past ten years, which can be considered as prerequisites for Ukraine's transition to the information society. The latter creates qualitatively new opportunities to increase the efficiency of the state and, at the same time, makes new demands on it. That is why the state should become a catalyst for the changes that are taking place, coordinating the activities of participants in the process of Ukraine's movement towards the information society.

**2.2. Analysis of national practice of managing virtual companies**

Global trends towards globalization and informatization of society and the economy make the use of modern information technologies is becoming increasingly important today, both in the world and in our country. The Internet offers great opportunities for national companies to enter the world market, expands sales channels, unites suppliers and buyers into a single system.

Considering the problems and prospects for the development of virtual business in Ukraine, it should be noted that it has a relatively short history. In the West, the first electronic transactions on the Internet were recorded in 1995, and in Ukraine only in the early 2000s, the first online stores appeared, in which users began to actively buy books, music, tickets, products, computer appliances, and electronics, household items, etc.

By the end of 2022, total online store sales worldwide are projected to reach $ 2 trillion (!). Growth compared to 2017 will be + 6%. Almost half of all e-commerce sales in 2017 accounted for China (47%). In monetary terms, this is approximately $ 900 billion. Thus, this country will rank first in the world in terms of sales in e-commerce, displacing the United States from this place [10; 39].

In the context of growth and prospects, the Ukrainian market is one of the most attractive. Unlike many European countries, Uanet is still very far from saturation.

The approximate turnover of services and goods in the e-commerce market today is about $ 65 billion. The largest group of sites in the segment of e-commerce are EVO projects - Prom.ua, Bigl.ua, Crafta.ua, Shafa.ua. All of the above sites are trading platforms. During 2020, Ukrainians spent 14.2 billion hryvnias on them, which is almost 70% more than in the previous year. 31% of Ukrainian Internet users have made purchases online at least once. 64% of mobile users prefer to buy through mobile applications. About 52% think that browsers are more convenient in this regard. According to the NBU, the share of non-cash payments using bank cards in Ukraine increased to 38.1%. Currently, only one in five Ukrainian buyers buys online, and the share of e-commerce is not more than 6% of total sales in the country [10; 39].

# The market segment is the fastest-growing sector in the e-commerce niche, which is significantly ahead of classic online stores in terms of growth. One reason for this is that small businesses often find it difficult to maintain and promote their own sites; more often they work with a site that takes on part of the load. This reduces the entry threshold and the required investment. The top 10 most visited sites in Ukraine include three sites related to online commerce: OLX.ua, Rozetka.com.ua, Prom.ua. [5; 10].

E-business in Ukraine is gaining its positions gradually. The first big players who are looking for long-term prospects appear on the market. The number of customers grows along with their needs and desire to receive high-quality service at a fair price.

The introduction of modern information technologies allows Ukrainian companies to receive the following benefits:

1. Significant reduction of corporate costs due to the optimization of trade relations exclusion of intermediate links from business processes.
2. Significant reduction of time spent on handling business operations and interaction with partners and customers.
3. Improvement of the quality of enterprise management through the full transparency of transactions and the ability to track the status of a business process at each stage.
4. Expansion of the business geography by entering foreign markets.
5. Increase the competitiveness and, as a consequence, the company's income.

However, on the way to the development of virtual organizations in Ukraine, there are many serious obstacles and problems (economic, technological, etc.), among which we highlight the factors of direct (micro-level) and factors of indirect (macro-level) influence.

The last one, first of all, includes economic problems caused by the risks of the global economic crisis and those that exist at the micro-level. For example, Ukrainian business is still characterized by a significant amount of black transactions, barter agreements, and offsets, which often leads to the concealment by enterprises of their corporate information systems. Due to the non-transparency of the internal activities of most large Ukrainian enterprises (which are the main customers of B2B solutions), the use of B2B solutions is theoretically impossible for them. These solutions can be implemented only where there is no intersection with the internal business processes of such enterprises.

Secondly, legislative problems. Important events in the field of legal regulation of e-business in Ukraine include the Law "On Information", "On Protection of Information in Information and Telecommunication Systems" and the Law "On Electronic Digital Signature" [14-16]. These documents determine the legal regulation of electronic document management, which is the basis of all agreements. The latter law equated a handwritten signature on paper to an electronic digital signature in an electronic document, defined the electronic document, the electronic digital signature, the holder of the signature key certificate and its user, and so on.

It should be noted that the legal framework of e-business in Ukraine needs further development and strengthening. There are many unresolved issues related to the regulation of relations between online markets and the Ukrainian state.

In addition, the lack of commercial trust of trading partners to each other. As you know, the alliances, transparency and business order, the technological readiness of the participants of the platform to interact are the basis of Western electronic trading platforms. And the impossibility of joint strategic actions of competing companies is one of the main obstacles to the development of electronic trading platforms in Ukraine. Furthermore, any business can easily become a victim of online fraud due to an unreliable electronic payment system in Ukraine.

Moreover, the basic level of automation is still low in most Ukrainian enterprises. If in the West at the very beginning of the Internet development was based on e-business internal system of accounting and planning of key business indicators and processes through EQF systems, which makes transparent material and financial flows of enterprises (manufacturers, suppliers, and contractors), then one of the main An obstacle to the mass implementation of B2B solutions at Ukrainian enterprises is the low level of their basic automation. Owners and top management of national organizations do not always correctly assess the role of modern IT in business, and sometimes are not interested in reducing unproductive costs by increasing the transparency of transactions through B2B applications. Currently, the most common accounting systems in Ukraine are designed solely to support accounting functions and the simplest financial reporting. At the same time, there are practically no automated systems for order processing, production planning, supply, and sales. In addition, Ukraine still has little experience in the development and operation of corporate sites, as well as the implementation of ERP systems. Unfortunately, many managers of national enterprises still have a bad idea of what e-business is.

Despite a large number of problems, e-business in Ukraine is still actively developing mainly in the field of telecommunications and banking. The share of medium-sized companies has grown significantly after the crisis, as in conditions of increasing competition and quarantine, the introduction of information systems becomes vital for them. No need to say how dynamic and changeable the telecommunications industry is. There are thousands of businesses in the market, most of them are individual entrepreneurs. In 2020, revenues from the provision of communication services were 61,976 million UAH, from which the revenue from the provision of telecommunications services - 91.1%. In 2018–2020, there was a tendency to increase revenues from the communication services, which in 2020 increased by 10.2% compared to 2019. Revenues from telecommunications services in 2020 increased by 10.5% compared to 2019 and amounted to 56,475 million UAH. In the structure of revenues from telecommunications services in 2020, the largest share was made by mobile communications - 61.9% and fixed access to the Internet - 14.4%, the total share of which in the total revenues from telecommunications services amounted to 76, 3% .

According to the State Statistics Service of Ukraine, in 2020 revenues from the provision of fixed Internet services amounted to UAH 8,136 million, the share of which was 14.4% of total revenues from the provision of telecommunications services. The main part of revenues from the provision of fixed Internet services was revenues from fixed (wired) broadband Internet access (WSD), the share of which at the end of 2020 was 83.2%. In 2018-2020, there is a trend of growth in revenues from the provision of fixed Internet services, which in 2020 increased by 11.1% compared to 2019 . No other sector of the economy can boast of such growth.

The most impressive increase in turnover in the field of intercorporate trade (business-to-business trade, or B2B). At the same time, the Ukrainian B2B business has the same basic mechanisms for implementing online corporate sales as in the global B2B business. These include CRM (Customer Relationship Management); e-procurement (electronic supply systems); marketplace (online stock trading); direct sales; SCM (Supply Chain Management). They all differ in functionality. For example, some mechanisms optimize the relations between enterprises (e-procurement, marketplace), others - internal processes of the enterprise (CRM), third ones - the activity of several enterprises (SCM), etc. One way or another, the partial implementation of these mechanisms in Ukrainian B2B projects is already underway.

In 2016, Microsoft made a forecast that by 2020 a quarter of the world's economy will be electronic (in 2005 this figure was 15%). The company believes that today in the further development of digitalization of the world economy significantly contributes to mobile and cloud technologies, the Internet of Things (IoT), and large data processing systems (Big Data) [9]. According to the forecasts of the international consulting company McKinsey, the full transition of the global industry to a digital technology platform will take about 100 years. By 2025, according to McKinsey forecasts, the contribution of the industrial Internet (Internet of Things) to the world economy could be about 11% of world GDP. It is expected that the share of OECD countries in GDP growth as a result of their participation in the digital industry will be more than 60%, and developing countries, about 40% (China, India, other BRICS members) [52].

Regarding the changes in the UNCTAD e-commerce development index in Ukraine for the period 2015-2020, we can note the progress in forming the basis for the development of e-commerce in the country. The indicator shows an increase of 16.4 units. to the level of 70.1 in 2020. We observe an increase in the share of the population that has bank accounts and actively uses cards. The number of secure Internet servers increases by 12.3 units. However, a significant disadvantage for the development of e-commerce in the country is the low share of regular Internet users. Ukraine lags behind in the field of e-commerce - a decrease in the ranking from 58th to 63rd place during 2015-2020. However, a positive point is the growth of the share of e-commerce in the country's GDP - by 1.2 percentage points. until 2020.

The volume of retail sales in the global e-commerce market in 2019 was $ 2.3 trillion, which is 10.2% of total retail sales. At the same time, there is a stable tendency for e-commerce share increase. It is expected that in 2021 it will reach 17.5%. In Ukraine, this figure is much lower than the world average and lower than its neighbors. At the same time, the growth rate of e-commerce in Ukraine is one of the highest in Europe, which indicates a significant growth potential. The approximate size of the domestic e-commerce market in 2019 was about 50 billion UAH. Since data on sales by individual players are not available, you can try to assess the state of competition by the amount of traffic. According to the specialized site, the dominant positions are occupied by the portals prom.ua and Rozetka.

Today there is a tendency of gradual transformation of "web windows" into full-fledged online stores. Creating a consumer-oriented Internet portal allows the retailer to increase the geography of its market presence, sell products faster and get an additional channel for marketing and advertising.

In Ukraine, some companies working in the field of information technology, business production, have created network structures for management. After three years of operation, Kvazar-Micro (www.kvazar-micro.com) has brought together regional offices, business partners (dealers and system integrators), sales representatives, and regular customers using the KM E-Business system.

E-commerce systems are developing rapidly. For example, on www.meta-ukraine.com today there are about 150 e-shops. However, only some of them provide the opportunity to pay online (Bambook, Azbooka), while most of them use the traditional payment methods (payment on delivery, bank or postal transfer, etc.). Also, some virtual businesses with elements of innovation infrastructure appear in Ukraine. For example, in Dnipropetrovsk, a virtual technology business incubator has been created to promote the developments of Ukrainian scientists on world markets, create a virtual market for scientific and technical developments, assist developers in finding investors and partners in the project; examination of intellectual property, consulting and management support of innovative projects [42].

**Chapter 2: Conclusion**

Over the last ten years, such factors of socio-economic, scientific, technical, and cultural development have been formed, which can be considered as prerequisites for Ukraine's transition to the information society. Today, there is both scientific and human potential for the transition of our state from an industrial to an information economy. With the effective and competent use of these opportunities, Ukraine can achieve a serious breakthrough in the information sphere. It is obvious that this requires a centralized approach, which can be implemented only within the framework of targeted programs, such as "Electronic Ukraine" and "Strategy for the development of Ukraine's information space until 2020." After all, modern information and communication technologies are a powerful lever for renewing and increasing the competitiveness of national enterprises and the development of an innovative economy. The information society creates qualitatively new opportunities for improving the efficiency of the state and, at the same time, makes new demands on it. That is why the state must become a catalyst for the changes taking place, coordinating the activities of participants in the process of Ukraine's movement towards the information society.

Summarizing the national experience, we can say that the Ukrainian information economy will be actively developing in the near future. We expect an increase of growth rates to 10-15% annually.

Ukrainian enterprises must be able to respond quickly to the situation, quickly adapt to changes, constantly modernize their business processes and innovate using modern information technology in order to function successfully in the information economy.

**CHAPTER 3**

**WAYS OF INNOVATIVE DEVELOPMENT OF VIRTUAL MANAGEMENT AS A CONDITION FOR THE FORMATION OF THE INFORMATION SOCIETY IN UKRAINE**

**3.1. Innovative approaches to designing virtual organizations**

Innovations in virtual companies can be the creation of new or significantly improved products and services, as well as the introduction of new production technologies, business processes, and organizational tools, including strategic planning, organizational design, resource management, corporate culture. The success of innovative activity of modern virtual organization is largely determined by their organizational structures - functional and organizational schemes for building a single information space that provides operational management of technology, resources, and coordination of all agents.

There are many innovative approaches to the design of efficient virtual systems. And we would like to distinguish agent-oriented and integration approaches among others.

***Agent-oriented approach.*** An agent is a physical or virtual unit that has the resources and abilities to perform various tasks, operate in a certain electronic space, and communicate with other agents. The behavior of the agent is determined by his individual goals, taking into account the available resources, and depends on his perception of the environment. The main features of the agent are autonomy, adaptability, and rationality.

There are three main types of software agent architecture: Reactive, Deliberative, and Hybrid. Reactive agents are able to respond in a strictly defined way to specific environmental disturbances, so they are designed to solve elementary problems. Agents of the consulting type can, based on their knowledge, perceive such disturbances, analyze them and choose the method of reaction. Hybrid architecture is a combination of the first two types.

Thus, the virtual organization creates a very complex and ever-changing structure of agents, which must be managed, taking into account the network management principles. The tool for managing cooperative processes in the network, in essence, should be a software tool that coordinates the activities of the virtual organization on the basis of business process models and optimization tools in real-time.

To solve such problems, it is advisable to use the principles of multi-agent systems (MAC). The application of MAC principles is possible as a basis for building a management system for a virtual organization, as well as in developing a concept of a dynamic model of operational management of a virtual organization and its agents (they are resources and competencies, act in their interests) and cooperate to perform common tasks ).

The MAC systems have the following properties: object orientation, flexibility, adaptability, and high reactivity which determine the effectiveness of the use of MAC in the construction of a virtual organization.

We can distinguish three organizational levels in multi-agent systems: microsocial, which contains the operating environment of a small number of agents; group, which is the separation of roles of agents, the emergence of organizational structures and aggregation of agents to solve specific problems; the level of "global society", which reflects the dynamics of a large number of agents, the overall structure of the system and its development.

The design of multi-agent systems can be carried out both from top to bottom and from bottom to top. The general scheme of customer order management in a virtual organization with the help of MAC consists of order management agents (responsible for the execution of the order, from its receipt to the end of work); process management agents (responsible for the implementation of individual processes to fulfill orders); enterprise management agents (represent individual enterprises in the overall virtual structure and are responsible for their performance of certain technological operations).

The organization is the result of the actions of agents, which, in turn, are limited by the organizational structure. Based on this condition, it is possible to define the virtual organization as a set of agents: agents are grouped together in a virtual organization to perform the current task, for which common goals and intentions are set. Successful solution of the task by each agent in a virtual organization leads to the successful achievement of the set purpose.

The main features of the formation of a multi-agent management system VP include:

* interaction in a single electronic space according to single standard support of communications with external structures, potentially ready to join the process of providing services or products on agreed terms;
* conflict resolution according to uniform rules;
* creation of a single knowledge base for evaluating the activities of VP participants;
* availability of a system of operational coordination of goals for all elements of the virtual organization.

Thus, the concept of a multi-agent management system of a virtual organization formulates a dynamic approach to the concept of "virtual organization". The use of MAC principles allows to implement the main requirement for a dynamic model of operational management of VP processes in real-time - to form from the available set of business process models, optimization algorithms, and information the best business process configuration for a particular project.

***Integration approach.*** The creation of virtual enterprises is based on the formation of a single organizational, technological, and information environment through the temporary pooling of resources of different autonomous economic agents in order to increase the efficiency of their activities and competitiveness.

Among the integration organizational forms of virtual enterprises are the following.

*Virtual value chains* are a continuation of the concept of distributed organizations, which is based on the idea that the product (or service) "travels" from the component supplier to the manufacturer of finished products, and then to the customer. Virtual chains to a greater extent can serve as an example of this kind. They connect suppliers, manufacturers, distributors, and retailers into a single communications network that uses feedback, monitoring, and simulation technologies to deliver regular and efficient supplies. Many large automotive and consumer electronics companies, for example, already use virtual supply chains, although the concept is still evolving.

*Virtual communities* are advanced forms of communication networks in which several companies or organizations participate on a regular basis. Virtual communities usually take one of two forms: research or other association created to share information and knowledge, or market communities where the provider is in regular contact with small but connected customer groups. Contact is frequent and two-way, sometimes it is implemented in supply chains. Manufacturers and retailers also use virtual communities to get more accurate information about customer needs and desires.

*A virtual web,* like a virtual value chain, is a network of several organizations which are not only structured virtually in a value chain but also bring together many organizations spread across a single chain.

The main purpose of creating a *virtual corporation* is to combine key technologies and the experience of partners from different countries to conduct more effective actions in the global market. A virtual corporation is characterized by its independence from the participants (the possibility of easy change of partners), the presence of an indirect management mechanism (delegation of authority), the transition from individual to the collective responsibility of partners. It provides contractual relations between all nodes of the organizational network and the formation of their joint ownership. The virtual corporation is often formed in the form of a parent virtual organization with a network of subsidiary virtual branches, offices, etc.

*A virtual partnership* is a computer-integrated (artificial) organization of people who work together (who are in a cooperative relationship, ie work together and coordinate actions) in order to make a profit, being geographically distant from each other. It should be noted that in its content the concept of a virtual society is quite close to the idea of ​​a virtual working group. In this case, each partner, to some extent participating in the management and control of the virtual organization, is individually responsible for the results of work, and the loss of a partner means the collapse of the virtual organization. There are two basic forms of a virtual partnership: full virtual partnership when all partners are equal in the management of the enterprise and bear equal responsibility for its obligations; limited virtual partnership, where one of the partners has extensive authority to control and manage the company and has unlimited liability for its obligations, and the other partners are not responsible for the obligations of the partnership.

In a *virtual association*, partners who are at a distance from each other cooperate only when performing joint operations or functions. There are two key structural characteristics: the interdependence between the component operations and the distribution of responsibilities between the participants.

*The virtual consortium* is similar in its characteristics to the virtual association. As a rule, it is created in the interests of large programs or innovative projects. The virtual consortium can electronically bring together companies from different countries, industries, and forms of ownership. Thus integration assumes first of all joint performance of functions and construction of the distributed network of business processes.

*A virtual cartel* is a computer-integrated form of association of legally independent organizations in one industry that have agreements on prices, production volumes, and markets.

*A virtual syndicate* is a type of virtual cartel in which, in addition to the agreements mentioned above, there is a single sales authority for the products of its members. The purpose of joining a virtual syndicate is to benefit from the centralization of sales. Syndicates are usually formed in industries with mass homogeneous products.

In its turn, a *virtual pool* means a temporary merger of different companies (possibly different industries) received electronically, where there is a set of rules on the distribution of total costs and profits in a common pool in a fixed proportion for all the entrants.

*A virtual concern* involves the electronic integration of companies in one or more industries on the basis of centralization of scientific, technical, and production functions, sales, finance, accounting, etc. Participants delegate to the virtual concern part of their functions - those that can not perform themselves, but remain legally independent.

Finally, the strongest form of computer integration of organizations is a *virtual trust*, when all activities of organizations are combined, and they themselves lose their legal and economic independence.

One of the complex forms of virtual enterprises is a *virtual financial-industrial group* (FIG). Like a regular FIG, it consists of a number of heterogeneous legal entities, distant from each other, which fully or partially combine resources with the use of Internet technologies on the basis of a contract for the establishment of FIGs for technological or economic integration. As the name suggests, the virtual FIG includes various industrial, commercial, and financial institutions (banks, insurance companies, etc.). It should be noted that usually the term of operation of such mega-enterprises is not limited to the implementation of certain projects.

*Network brokers -* an organization that fulfills orders for management, ie engaged in facilitating network interaction between companies. Typically, network brokers deal with web platforms, maintain relationships between companies that act as web partners, and facilitate the formation of virtual corporations, which are formed temporarily in connection with the current needs of the market or customers.

*Internet incubators.* One of the most famous Internet incubators is the IdeaLab project, founded by Bill Gross in 1996. This was the first attempt to profit from the use of a virtual system for organizing the processes of creating new businesses and projects. The activity of the virtual organization IdeaLab consisted of an intermediary information association of venture investors, legal and marketing support companies, office and production centers for the implementation of innovative projects. Initially, IdeaLab existed as a website that provided information on opportunities to raise venture capital and other resources needed to commercialize new ideas.Expanding the scope of activities, IdeaLab gradually began to participate directly in the implementation of projects and "physically" develop, creating offices and offices in many regions of the world. As a result, today the market value of the company is 220 million dollars. In the USA, the staff has more than 500 employees working on 50 projects simultaneously. After the success of IdeaLab, Internet incubators began to develop actively, the most powerful of which today are I-Hatch, Inted Change, Venture Frogs, VenCatalyst. These companies are rapidly launching new companies through an extensive network of relationships with firms that provide resources and organizational and coordination services for the implementation of innovative projects.

It should be noted that today in practice virtual organizations implement more than one form, but are a hybrid of several virtual systems. The most acceptable organizational form capable of absorbing all the achievements of science and technology may be the "Virtual Web-corporation", which involves the creation of supporting structures such as "Virtual Web-platform" and a unit of virtual management, called a number of foreign researchers Net-broker "(hereinafter -" network manager or administrator "). Virtual Web-corporation or as it is also called "virtual cluster" is a regional network of industrial enterprises that have a common scheme of production of finished products. The cluster is created by combining enterprises located in different parts of the globe and forming a basic competence. The entire infrastructure is based on information and communication technologies, which are the basis of a virtual Web-platform. This allows them to overcome the geographical dispersion of the industrial cluster and to interact with companies of any class.

Leading industrial companies are now actively embarking on the formation of virtual platforms for the production of goods and services and for e-commerce. Using the capabilities of the virtual platform, as well as logistics solutions and distributors' partnerships, it is planned to quickly and profitably transform product promotion channels in Europe and America, combine experience, industry knowledge, and development into a single core competency that will benefit consumers. improve service and increase competitive advantage in the market.

Another example of innovative structuring can be virtual organizations created on the basis of innovative cloud service technology. The principle of cloud services is the provision of a service on the "cloud", ie remotely and on the equipment of a third-party company - the provider. According to analysts, in the near future in Ukraine, as well as around the world, a real boom in demand for cloud services is expected.

According to IDC, the market for public cloud computing in 2009 was $ 17 billion - about 5% of the total information technology market [49]. The cloud services market is projected to reach $ 83 billion by 2016. In addition, more than 30% of companies worldwide are already deploying at least one cloud solution, according to consulting companies [26]. In 2012, the global cloud services market was $ 26.4 billion. In 2019, it will grow almost 10 times, by 2026 - almost 20 times, to $ 521.8 billion. According to Gartner, in 2022 the cost of corporate clouds in the world will reach $ 331.2 billion.

In Ukraine, cloud services began to be actively used in 2014. After the annexation of Crimea and Donbas, many companies from the East moved to Kyiv or other cities and decided not to rebuild their data centers (because it is expensive), but to rent a place in the clouds. They had no other option to keep the business.

The main providers of cloud services in Ukraine are foreign providers - Amazon Web Services and Microsoft Azure. Their market share is over 60%. In 2019, the volume of the Ukrainian market of public cloud infrastructures for the first time exceeded the size of the market of traditional data centers.

The global cloud services market is concentrated around three IT giants: Google, Amazon, and Microsoft, which account for 70% of the IaaS market. Amazon and Microsoft services are mostly used by US and European companies. In China, the market is almost completely monopolized by the local provider Alibaba Cloud [4].

### In Ukraine, in addition to global cloud providers, there are also local operators: De Novo, GigaCloud, UCloud, "Park", VoliaCloud, Tucha. As of 2020, their combined market share was $ 6.1 million.

### In Ukraine, the cloud services market is still in active growth. Five years ago, it was just over $ 5 million. Now it has crossed the $ 23 million mark and continues to grow rapidly, moving in line with global trends.

However, its potential is much greater than the available $ 23 million. Ukrainian service providers are not inferior to Western ones in terms of quality, in addition, they are ready to offer individual solutions and provide technical support as soon as possible. In principle, no one is forcing businesses to use cloud services. He can deploy and maintain complex IT systems on his own, but in the end, this can negatively affect the efficiency and competitiveness of the company.

Cloud services are one of the world's most dynamic IT markets. Businesses want to be flexible, mobile, and more efficient, so they no longer want to build their own data centers and worry about their maintenance. They choose cloud services. The SaaS segment has the most money: in 2020 it amounted to $ 80 billion (from $ 182.4 billion in the global cloud market). The second place was taken by the segment IaaS, in the last place - PaaS.

Examples of the use of the cloud service may be outsourcing services for the proper submission of financial statements to the relevant government agencies or the use of the postal service of third parties. Virtual Automatic Telephone Station (ATS) Service - one of the youngest in the global telecommunications market, but it is one of the most promising and dynamically developing technologies of so-called "cloud" services. The first commercial offers appeared in 2004, and already in 2006, this service penetrated quite deeply into the markets of Western Europe and North America. According to analysts, in 2006 the total global market for the service of "virtual ATS" was estimated at $ 2.5 billion (1.1 million lines), then by 2007, the market grew by 100% to $ 5 billion (2 million lines). According to the results of the last three years, the segment has been growing by almost 30% annually.

The essence of the "virtual ATC" service is that you do not need to buy an "iron" office ATC, which connects to the telephone lines of the operator anymore, it is enough to have high-speed Internet access. Through this communication channel, the customer can receive a virtual ATC service, when all services using IP-telephony are provided by the equipment located at the provider.

The main users of virtual ATC services are small and medium-sized companies, for which it is especially important to reduce the cost of both the purchase of equipment and the payment of either full-time specialists or outsourced. In addition, office PBXs are difficult to upgrade to new tasks. The advantage of virtual ATCs (with a low initial payment, usually a hundred dollars) - is easy scaling, ie you can quickly increase the number of city lines. The operation of a virtual ATC is especially convenient for companies with a regional network and several offices. In this case, the settings allow you to combine all branches of the company into a single telephone network, organizing corporate communication with short numbers.

Virtual ATCs can perform the following functions:

* intelligent call routing, ie divert incoming calls to another landline, mobile phone, IP-phone or Skype, Zoom, Viber;
* flexible settings for voice menu and voice mail;
* call hold;
* view the report on the calls made;
* record all telephone conversations;
* compile "white" and "black" lists of subscribers;
* send faxes via the Internet;
* save phone number when changing office;
* integrate and synchronize with other customer information systems, for example, organize calls from potential customers.

However, the rapid development of cloud services poses a number of pressing issues to the market. First of all, it is information security and data storage. It should be added that in recent years, many new viruses and programs that contain malicious code. Another problem is the underdeveloped IT infrastructure, which is not ready for the mass installation of virtual machines, for the rapid implementation of modern technologies. Finally, Ukrainian potential consumers are not sufficiently informed about the benefits of the new "virtual ATC" service. In order to change this attitude, cloud services need effective advertising, the service of virtual PBX must become a fashion trend.

Cloud technologies are becoming more common in the financial sector, which is one of the most competitive. Today, banks face three main tasks: reducing operating costs, maintaining the loyalty of existing clients, and attracting new customers. If earlier remote banking service was mainly informational, now mobile technologies and Internet banking are actively developing. Fully virtual banks are operating already, offering absolutely real banking products and services on much more favorable terms than their competitors. They do not need offices, as a new generation of self-service terminals, ATMs are being installed en masse, which stimulates the demand for vending products and their service.

Over the past three years, there has been a steady increase in the number of projects to build the bank's front office. It should be noted that banks are cautiously implementing "cloud technologies", sometimes creating their own IT companies, primarily due to a lack of confidence in the security area.

**3.2. Formation of innovation culture as a key to the success of innovative development of virtual organizations**

As we already mentioned in Chapter 1, nowadays, in the time of virtualization, the business requires a revision of traditional theoretical and practical aspects of management, including the conceptual provisions of organizational culture, which today is seen as a socio-ethical resource that unites the efforts of all employees on behalf of achieving overall success.

Corporate ideology is especially important in virtual companies. This is primarily due to the fact that employees often live and work in different countries or at a great distance from each other. Only with a well-constructed organizational culture, each virtual employee will clearly understand the goals of the company and the rules of their behavior in it. Therefore, in the structure of the innovation culture of the virtual organization, we will distinguish three key system-forming elements: learning, communication, assessment.

The most important element of virtual culture is, undoubtedly, communication. In virtual organizations, communication technologies are used to replace the physical structure, enabling decentralized work; as a result, the organization itself becomes more flexible and blurred. The goal of communications is to ensure that knowledge flows are efficient and timely and connect all elements within the organization, as well as its suppliers, customers, and stakeholders.

One of the most common forms of work organization in virtual companies is the establishment of a remote relationship between the employer and his employees. Today, in Europe, several million people have the opportunity to remotely access their workplace using only special software, their laptop, and modem. This equipment allows you to perform virtual activities by connecting to distributed communication networks. A virtual workplace includes two main components - the employee's workplace and the corporate network of the enterprise, to which the employee connects to perform their tasks. Organizational networks operate on the basis of continuous communication, which is vital both for knowledge management and for continuous management and coordination.

In order to manage remote workers as effectively as possible, first of all, it is necessary to establish clear communications both between the manager and employees and between members of the virtual team. It is important that communications within the company are as developed as possible, and the necessary information is promptly delivered to those points where it would be needed at the moment. Such communications depend on the focus on the common cause, and the lack of competition between different departments, and the degree of cohesion of team members, and the friendly relations between them.

Scientists Karen Lojeski Sobel and Richard Reilly consider the so-called affinity distance (a barrier between remote employees) to be one of the serious problems in the work of the virtual team. This barrier can be caused by both cultural differences and psychological disunity, which hinder the achievement of goals. The authors propose to solve the problem of affinity distance through regular personal communication of members of the virtual team. In teams where employees communicate only by e-mail and instant messaging all the time, some issues related to perceiving the information may occur. These kinds of communication cannot convey the mood of the interlocutor, and the messages may be misinterpreted by the recipients. Video conferencing can be an alternative to e-mails. In addition, it will be useful to create a project website or a virtual team page, where you can post information not only about the tasks and goals of the project, but also the rules of the relationship between the virtual team staff, their photos, and short biographies.

Because instead of personal and individual supervision of employees, virtual management is based on coordination, motivation, and creation of flexible network teams to achieve goals, the main elements of virtual culture are evaluation. In virtual organizations, where employees are trained and motivated to adhere to high quality, managers develop quality standards and tools that will allow employees to adhere to these standards.

However, the responsibility for compliance with the standards depends on the employees. Therefore, virtual companies are now actively implementing such effective evaluation systems as goal management, a system of balanced scores, a system of grades, a system of key performance indicators. All these evaluation systems are aimed, on the one hand, at employee satisfaction with their work, and on the other - at improving the efficiency of the organization.

It is important to note that at the forefront in the control of subordinates of the management of personnel in a virtual company should be the trust of them by the head. In a company based on the principles of teleworking, the manager must trust the subordinate and understand that the main motive for the remote worker is a free work schedule and the ability to manage their time. An alternative to strict control may be to set clear goals and objectives for subordinates. It is ineffective in such organizations to control when a subordinate is at the computer and how many hours a day he devotes to work, or whether he communicates with competitors.

Learning plays a central role in the culture of virtual organizations. For virtual organizations, knowledge is the basis of their vitality. In virtual organizations, where people work remotely or shop through remote sites, it all depends on the network's ability to process knowledge and transfer it in a rational way.

It is important to note that the idea of a virtual organization intersects with several other modern concepts of management, especially with the theory of knowledge management and the theory of "learning organizations". The main thing that distinguishes the educational organization is the search for new opportunities to create conditions for the development potential of its own employees, aimed at adaptability to continuous renewal, to constantly improve the quality of human resources as a competitive advantage of the organization.

Thus, if in a traditional industrial organization the behavior of the employee is focused on the tasks and instructions of management, then in the educational organization the labor process is aimed at change, innovation, solving problems that require constant renewal of knowledge, skills. An educational organization is one that, by contributing to the training of all its employees, is constantly transforming itself. Modern virtual business requires employees to constantly maintain the performance of complex corporate information systems, necessitating the need to take into account current trends and innovations in the information world.

The above analysis allows us to conclude that virtual organizations are characterized by an innovative type of organizational culture which is an alternative to conservative culture. The defining difference of innovation culture is its focus on continuous staff training, search, and creation of opportunities and conditions for the development and realization of the potential of its own employees, the desire to constantly improve their competencies as a competitive advantage of the company. The strength of virtual organizations lies in the growing ability to be creative, to the flexibility that follows from the network style of the organization. In the long run, the organization focuses on growth and the acquisition of new resources, encouraging personal initiative and freedom.

Managing the culture as a stabilizing factor of virtual systems in a constantly changing environment is an extremely difficult task, because the methods of forming a positive culture of the organization, as a rule, are informal. Computer and communication technologies are leading to radical changes in the traditional system of labor relations. The boundaries between a permanent job and a temporary contract, team members, and freelancers are becoming increasingly illusory. Despite this, there are numerous examples of powerful and purposeful changes in the culture of the organization of many companies.

American concern IBM, which was called the "Model of employment in the future." is one of the examples of the radical personnel reform. The essence of this model is that the company has a human resources core, which is responsible for "maintaining customer relations." Administrative and managerial functions are assigned to a minimum number of full-time permanent staff. Professionals are united in the "Talent Cloud". They are included in certain teams for a period of several days or weeks to months and even years, depending on the duration of the project. According to the document, freelancers provide services to IBM clients. Those interested will be able to offer themselves on an online platform such as an online auction, and companies from around the world will be able to attract the right staff.

The proposed "model of certification" of IBM, which formed the basis of the system of selection of future employees, seems interesting. Proposals of applicants get color differentiation. According to the concern, the decisive factor for the success of the applicant should be a "digital reputation": the profile of the applicant, which includes evaluation information obtained not only from users of social networks and IBM employees but also from third parties, including those who do not relevant to his professional activities. This is accompanied by a detailed description of participation in specific projects. This item includes both positive ("Special Award" for special merits) and negative ("Did not perform on time" or "Last week did not show any results"). All this information is woven into an electronic resume, which becomes the main document of the applicant. Authorized companies can view it - according to the well-known principle of the social network Facebook. In these circumstances, employees will have to constantly worry about the need to improve or at least maintain their "digital reputation".

Employment agreements are developed without taking into account regional norms. The IBM model provides for "unified standard employment contracts." This circumvents national labor laws, as well as wage regulations and existing sectoral agreements. The army of employees who have registered in the "Talent Cloud" receives a reward upon the implementation of the project or depending on the time spent. The benefits of such concerns as IBM are obvious. Personnel costs are significantly reduced compared to the current model, and companies gain access to an army of professionals from all over the world.

The changes that are taking place are contributing to the increasingly narrow specialization of companies and individual employees. Cloud technologies allow users on different continents to work on a common task in real-time as if they were sitting in the same office. All this affects the relationship, both between the employees themselves and between them by the employer.

**3.3. Methodical recommendations for assessing the effectiveness of the development of information and communication infrastructure of virtual management**

The evaluation of the effectiveness of the development of virtual management infrastructure is associated with the need to process and analyze a large amount of information. The solution of this problem is especially relevant for the system of regional governance, as local self-government is the level of government that is closest to the population, it is formed and controlled by it, and the issues of meeting the basic living needs of the population are resolved at this level of authority.

The infrastructure of access to municipal services means a set of software and hardware and other technical means that perform functional tasks to organize access of citizens and organizations to the consolidated register of state and municipal services (functions).

The creation of a comprehensive system of indicators for measuring the level of development of information and communication technologies and methodology of its practical application started to form in developed countries in the late 1990s. However, these methods differ a lot. Some of them are focused on assessing the "readiness", "maturity" of e-government services, others - on assessing the benefits of implemented e-government programs.

Relying on the study of the experience of various researches conducted in world and domestic practice, we can formulate the following recommendations.

Firstly, a special methodology for evaluating a government or municipal website should take into account a number of specific indicators, such as the completeness of the site materials; relevance, and availability of posted information (including how easy it is possible to find certain data on the website), etc.

Secondly, in order to better monitor the development of public services online and to measure the indicator "availability of public services online", they should be grouped as follows:

* *group of income-related services:* services where income from citizens and businesses goes to the government (mainly taxes and payments to social insurance funds);
* *group of services related to registration:* services related to the recording of personal data or data on things as a result of administrative duties;
* *group of services related to declarations:* public services that provide citizens and businesses with declarations for the payment of taxes and contributions;
* *group of services related to permits and licenses:* documents provided by governmental organizations that give permission for the construction of a house, business management, etc.

In addition, it is important not only to evaluate the design of the site but also to evaluate the interactivity of sites at all levels of government. Sites should be evaluated according to an integrated summary criterion, which consists of the following components:

1. quality of information content of the site;
2. user-friendliness of the interface;
3. attractive site design;
4. site interactivity;

Moreover, in order to assess the qualitative aspects of the proposed e-government services, we propose to introduce criteria that contain a number of indicators to which experts assign certain coefficients (points). The total site evaluation criterion is defined as an average of 4 criteria and all evaluations of experts involved in site evaluation.

The rating of the website is assessed by forming a query with the full name of the authority in Internet search engines. A positive assessment is accepted if in the first ten documents found there is a document posted on this site.

**Chapter 3: Conclusion**

The analysis above allows us to conclude that modern virtual enterprises are an innovative form of a business organization aimed at creating a new mechanism of market competition, especially for enterprises involved in the creation of complex knowledge-intensive products. This mechanism should be based on the formation of a flexible structure capable of responding quickly to market changes and customer orders through cooperation, coordination, and integration of resources of autonomous economic agents.

We also conclude that virtual business does not simplify the process of personnel management, but requires a modern strategic approach to its employees as human resources.

Thus, an important component in achieving the ultimate goal of the national target program is the need for analytical and sociological research to assess the quality of e-government services and the demand for e-government services by citizens. The obtained differentiated results of monitoring are designed to contribute to the improvement of these information resources, as they must be analyzed, taken into account, and constructively perceived by employees of the executive and legislative bodies responsible for information policy. Ultimately, this should help identify the main trends in the modernization of the system of state and municipal government, and most importantly, have a significant impact on the functioning of government.

**SUMMARY**

As a result of this analysis and investigation, we draw the following conclusions:

1. It is proved that with the development of society, economy, and science the prerequisites and patterns that cause changes in management paradigms and make adjustments to previous conceptual provisions are formed.

In connection with the penetration of information and telecommunications technologies in all spheres of society, the radical changes in the organization and management of the economy, the social structure of society, which determined the formation of a network or information paradigm happened in the late twentieth - early twenty-first centuries. Trends in the informatization of society have greatly influenced the search for new forms of organization and management of the enterprise and led to a change of traditional ideas about the boundaries of enterprises, industries and the need for a new perspective on business process management. In the new paradigm, business enterprises are seen as networked and virtual corporations focused on knowledge, information, and their boundaries become uncertain.

2. It is determined that a virtual organization is a cooperative network of enterprises (organizations, individual teams, and people) with key competencies for the best execution of market orders based on a single information system.

The typology of modern virtual organizations is revealed:

- centralized type of management where "agents" act on behalf of their organizations, and one of the "agents" manages the process, gives tasks to other "agents", summarizes results, and makes decisions;

- distributed type of management, where knowledge and resources are shared between "agents". But this type is characterized by a common command management body that makes decisions in conflict situations;

- decentralized type of management where all management processes are carried out only through local interactions between "agents".

In this research work, we emphasize that virtual organizations implement more than one form and are a hybrid of several virtual systems, such as virtual communities, virtual "web", virtual corporations, network brokers, etc. in practice. The space of virtualization of organizations includes three main categories of phenomena: virtual market, virtual reality, virtual (network) organizational forms.

It is determined that the management process of creating a virtual organization includes the following main stages:

* 1. Selection of potential participants
  2. Identification of a virtual organization
  3. Formation of a single information space
  4. Formalization of competencies
  5. Distribution of roles in the structure of a virtual organization
  6. Differentiation of statuses of network members
  7. Creating an environment of trust in the network of participants of the virtual organization
  8. Structuring information flows

Modern information technologies adopted by virtual enterprises are considered in this work, among them are: communication technologies (Internet and more modern broadband technologies); information storage technologies; monitoring and scanning technologies, analytical technologies for data set analysis and provision of information in cataloged form; modeling technologies, design technologies, production technologies, service delivery technologies; combinations of different types of technological systems that exist in the form of systems that may consist of one, two, three or more types of technologies.

The analysis allowed to formulate the distinctive features of the control system of a computer-integrated virtual organization:

* unified goal: a general view of values ​​and goals, a common idea of ​​the end result in terms of maintaining the synchronicity of operations and directives;
* independence of team members;
* voluntary relationship, which is expressed in the combination of partnership efforts;
* number of leaders: each person or group in the business system based on the Network has a special uniqueness to provide assistance at any point in the process;
* multilevel: business systems of the Network operate at different levels, i.e. cooperation between organizations, departments, and the public can be carried out at the same time.

In this work it is determined that being a new organizational form of the information society, virtual organizations have the following competitive advantages: speed of execution of the market order; reducing the deficit of information and increasing the efficiency of its use; intensification of processes of accumulation and transfer of knowledge; establishing a high level of trust; intensification of cooperative relations between partner companies, etc. But at the same time, virtual organizations have weaknesses, namely: excessive economic dependence on partners, which is due to the narrow specialization of network members; practical lack of social and material support of their partners due to the abandonment of the classic long-term contractual forms and normal employment relationships.

Thus, we can note that the complexity of managing a virtual enterprise is due to the need to find a compromise between the integrity of the object and the flexibility of economic cooperation.

1. Based on the analysis of global trends, it is substantiated that in the information society there is a rethinking of the role and importance of the state, designed to solve complex problems of coordination of administrative, market, technological, social processes to increase competitiveness and economic growth. The information paradigm in public administration involves the formation of the information state as a power structure of a new type, where management is carried out through a system of information technology and communications and a new system of functional representation.

We can identify some common features and approaches in the implementation of the strategy of formation and development of the information space in the most developed countries (USA, South Korea, Singapore, France, Great Britain), which are:

* encouragement of competition, fight against monopoly (control over the concentration of ownership in the media, issuance of permits for mergers, decisions on the disintegration of large monopoly companies);
* ensuring the right and technical capacity for access to information and information resources for the entire population;
* observance of freedom of speech;
* protection of the interests of national minorities, the next generation in the information sphere;
* protection of national cultural heritage, language, opposition to cultural expansion of other countries;
* information security;
* protection of intellectual property, fight against piracy;
* fight against computer and high-tech crimes;
* control over the use of information and telecommunication technologies in state institutions;
* censorship in global computer networks;
* the priority of ensuring the transparency of the information resource and the development of interactive services for the provision of public services.

The analysis of the international practice of regulating the information sphere of society shows that this process affects not only the interests of government agencies but also business and the whole society, and therefore requires joint participation and cooperation of all stakeholders, based on trust and mutual responsibility.

6. The analysis of the experience of Ukraine of practical implementation of the concept of virtual management suggested that despite the existing problems, the real prerequisites for creating an information space based on the active introduction of information and communication technologies in business structures and government agencies were formed in Ukraine in the early twenty-first century. The number of Internet users increased to 71%.65% of Ukrainians have the Internet at home. According to the study, almost the entire population of Ukraine under the age of 35 is an Internet user.

Ukraine ranks 56th in the world in terms of information technology development The competitive advantage that Ukraine has in this aspect is a strong IT staff, i.e. Ukraine has a very high level of training of programmers. Information technologies confidently occupy the third position in terms of export earnings.

The study identified obstacles to the development of the information society in Ukraine, which should include, first of all, economic and legislative problems, insufficient development and inefficiency of the information infrastructure, uneven distribution of communications and telecommunications in the regions; lag in the field of information technology and the development of computer technology; insufficient financial support for research in the field of informatization; shortage of specialists in the field of information; lack of commercial trust of partners to each other, as well as the low level of information and legal culture of the society in general and the information passivity of some citizens, especially the elderly, in particular.

In this master thesis, we consider two possible options for Ukraine's transition to the information society:

- The first option is to repeat the path that has already been taken or is being taken by other countries, mainly European ones. The speed of movement under this option will be provided by the allocated funds (not less than 5-7% of GDP). In addition, this path will require a significant change in the Ukrainian mentality and the reorientation of public consciousness to the goals, priorities, and directions of development inherent in the American or European way of life.

- The second option is to find a path focused on purely national criteria and characteristics of quality of life, socio-cultural features, and requires only minimal investment by the state in today's socio-economic conditions. However, it provides for at least minimal rates of economic growth, political stability in society, and the political will of the executive and legislature, which has set society the task of transition to the information society as a task of high priority.

On the basis of the comparative analysis, the conclusion on prospects of realization of the second way is made. Confirmation of the correctness of this choice is that in recent years in Ukraine have formed such factors of socio-economic, scientific, technical and cultural development, which can be considered as prerequisites for the transition to the information society: first, information becomes a public resource of development, its use became comparable to traditional (energy, raw materials, etc.) resources; secondly, we can say that in Ukraine the national market of telecommunications, information technologies, products and services has been formed and is successfully developing; thirdly, in public opinion there is an understanding of the urgency of the task of transition to the information society of political and economic points of view; fourth, today Ukraine is part of the world political and economic community, joining the rest of the world by cable and satellite channels; finally, fifthly, the state structure responsible for the creation and development of the information technology base to ensure the transition processes has been formed and is functioning.

1. We admit that the conceptual principles of e-government have already been created and there is an active process of mass introduction of information and communication technologies in the activities of state and municipal authorities currently in Ukraine. However, the main problems that inhibit the process of transformation of the content of management processes have been identified. Reforming the system of public administration is one of the priority national tasks, as the inefficiency of the political system undermines the strength, authority, and influence of the state on the development of the economy and society as a whole.

8. Some innovative methods and models of designing management structures of virtual enterprises are proposed in the research work. The agent-oriented approach to the design of a virtual enterprise, based on creating a complex and changing structure of agents - physical or virtual units that can operate in a certain electronic space, communicating with other agents with resources and abilities. The integration approach to the creation of virtual enterprises is based on the formation of a single organizational, technological, and information environment by temporarily pooling the resources of different autonomous economic agents in order to increase the efficiency of their activities and competitiveness. The most acceptable organizational form that can absorb all the achievements of science and technology can be a "Virtual Web-corporation", which involves the creation of supporting structures, such as a "Virtual Web -platform".

As an example of innovative structuring, virtual organizations created on the basis of innovative cloud service technology are considered. The principle of cloud services is the provision of a service on the "cloud", remotely and on the equipment of a third-party company - the provider. For example, virtual ATCs are one of the youngest in the global telecommunications market, but they are considered to be the most promising and dynamically developing technology of so-called "cloud" services.

The reviewed above innovation structures allow us to conclude that virtual organization is an innovative form of a business organization aimed at forming a new mechanism of market competition, especially for small and medium-sized businesses and enterprises associated with the creation of complex knowledge-intensive products. This mechanism should be based on the formation of a flexible structure capable of responding quickly to market changes and customer orders through cooperation, coordination, and integration of resources of autonomous economic agents.

1. The conceptual provisions of the innovative culture of virtual management are determined. Organizational culture is one of the system-forming and stabilizing factors of the virtual organization in the process of constant changes in the information society.

Communications, evaluation, and training are reviewed as system-forming elements of the culture of virtual management. The analysis of the basic elements allowed us to conclude that virtual management is characterized by an innovative type of culture that ensures the existence of a virtual organization as a self-organized system. The defining difference of the culture of virtual organizations is its focus on continuous staff training, search, and creation of opportunities and conditions for the development and realization of the potential of its own employees, the desire to constantly improve their competencies as a competitive advantage.

10. Methodological recommendations for assessing the effectiveness of information and communication infrastructure in the system of state and municipal government have been developed in this research work. The infrastructure of access to municipal services means a set of software and hardware and other technical means that perform functional tasks to organize access of citizens and organizations to the consolidated register of state and municipal services (functions).

In order to achieve the goals stated in the programs of e-government and e-municipalities, it is extremely important to regularly monitor the state of affairs with the development of informatization of regions (regional and local levels), as well as the demand for e-government services. Based on the comparative analysis of the experience of different monitoring methods conducted in world and national practice, the following methodological recommendations have been developed.

Firstly, a special methodology for assessing the government or municipal site should take into account a number of specific indicators: the completeness of the site materials; relevance and availability of posted information (including how easy it is possible to find certain data on the site); specifics of the competence of regional executive and legislative bodies.

Secondly, in order to better track the development of public services online and to measure the indicator "availability of public services online", they should be grouped together.

In addition, it is important not only to evaluate the design of the site but also to evaluate the interactivity of sites at all levels of government. Sites should be evaluated by an integrated summary criterion, which consists of the following components: the quality of the information content of the site; user-friendliness of the interface; attractive site design; site interactivity.

The obtained monitoring results in this master's thesis are designed to identify the main areas of improvement of the e-government program, and, what is more important, to make a significant impact on the customer-oriented functioning of government structures, ensuring effective interaction between government, population, and business.

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