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THE SOCIO-ECONOMIC ASPECTS OF COMMUNICATION ACTIVITY IN INFORMATION ECONOMY

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The results of the practice-oriented research are presented to help solve the complex problem of regulation of the sphere of communication activity in the information society which is characterized, on the one hand, by virtualization of information products and their separation from reality, on the other hand, by social responsibility to consumers and users of communication networks in the process of production of information products that are factors forming communication capital and communication society.

For specialists in economics and communication sciences.

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Content

Introduction

The society of mass consumption has brought to life service economy; and the information sector of economy has become the most rapidly developing one. It means that the basis of modern progress is the development of information and communication technologies whose diversity and opportunities have led to the formation of a new era – the information society which is gradually forming a communication society.

Positioning of any country in the modern information socio-economic space depends on the nature of interaction of the state and its economic and legal system in the social institutions and economic entities, on the internal economic relations, i.e. on the state regulation of communication processes in the economy. In turn, new information and communication technologies determine the content and development trends of communication just as an economic activity. The adoption of the Law of Ukraine "On the Information Society Development in Ukraine in 2007 – 2015" defined strategic goals and development trends of information society in Ukraine. According to them, the issues of communication of public authorities, local governments, businesses, mass media and the public need theoretical, methodological and methodical development. The relevance of the information flows and communication is defined as a function of the Information Security Board, founded in 2014 as part of the National Guard of the Ministry of Internal Affairs of Ukraine.

The urgent necessity for the development and implementation of state regulation of communications is defined by the need to introduce common standards for two-way information exchange between public authorities, local governments, business entities, public and mass communication. Lack of standards leads to reduced quality of implementation of decisions through: the neglect of the interests of all stakeholders, inadequate feedback, difficulty in controlling the information flows under free access to information resources. The result is a decline in the confidence of citizens and businesses in government agencies, raising social and economic tension in the society, underutilization of communication resources in the economy.

These features require some consideration in order to emphasize the scientific feasibility and practical utility of formulating and solving actual

scientific problems of development of theoretical and methodological foundations of communication activity at various levels of economy in the information society.

The first chapter of the monograph is devoted to the theoretical foundations of research and software development of communication activities at various levels of the economy under the current socio-economic conditions. The author has explored the peculiarities of the information society development in the context of conditions and prospects of the communication area formation; generalized the concept studies of the modern social and economic structure; outlined the general trend of transnational society dissociation, and formulated the features of the socio-economic development of the national economy. Following the completion of the available framework of the concepts and categories of various spheres of communication, the meaning of communication society, communication activities, communications capital and the whole communication space has been further developed in the monograph.

The sixth and seventh chapters of the monograph are devoted to the formation and implementation of practice development of communication activity. The author has outlined the socio-economic aspects of the Internet and e-government.

Some features of the methodological support development of communication activity diagnostics have been revealed by the author in the last chapter of the monograph. The scientific and methodical approach to the assessment of the areas of communications, which facilitates the analysis of conditions of development, was taken by the author. The paradigm of economic analysis foundations, trend models were used for synergetic approaches.

The scientific methodology employed in the monograph forms a single set of the theoretical and methodological support, which has theoretical and practical value to the subjects that develop the communication activities.

To validate the conclusions and recommendations, the author used the publications of domestic and foreign scientists, statistics of the official portals of the Government of Ukraine, Russia and the United States, the State Statistics Service of Ukraine, the World Bank, the site "Eurostat".

Chapter 1
Informatization of the commercial sector of economy

The current global trend in economic development is characterized by informatization of the commercial sector of economy. Thus, according to the report "Measuring the Information Society 2016" made by the Department of Information and statistical data on the ICT market (the Department of the Telecommunication Development Bureau of the International Telecommuni–cation Union (ITU)) in 2016, many people no longer go online, they are online [312]. Also at the end of 2016, the Internet was used by 3,696 million people [418; 419]. Computerization in business is realized by the modernization scheme.

The main driving forces that determine the commercial development of the informatization sector are as follows [312; 320; 321; 337; 401]:

lower prices of various information and communication technologies (ICT), which increases the appropriate demand and promotes economic trade;

spread of the electronic lifestyle – e-mails, trade and banking, booking travel; Internet and other services available only to those who have a personal computer;

a large number of electronic games designed for children who will potentially preach the possibilities of information and communication technologies at work tomorrow;

computerization of education which under the influence of competition, the growth of computer literacy of parents and students themselves as well as under the influence of the network services development increases the social role of information and communication technologies;

comfort and easiness of use of devices at home, in an office, in a car which have always been important engines of social change;

more and more people and organizations using electronic devices for personal safety and security;

home computer revolution.

Understanding the opportunities of ICT and interest in them is constantly growing. Undoubtedly, the industry of telecommunications and information technology is in constant motion all over the world: the transition to new

technologies, new participants, moving income and changing business models. For example, according to a number of industry observers, the proceeds from telecommunications in Africa can reach 69 billion US dollars by 2016 compared to 40 billion US dollars in 2010. Regarding ICT services, in 2010, revenues from the telecommunication sector reached 55 trillion US dollars, which corresponds to 44 % of the world gross domestic product (GDP) [312; 406; 418].

The total market of telecommunication services in Russia reached 1 674 billion rubles in 2015 (it was 1 135.6 billion rubles in 2011) [105; 324; 346; 394].

The volume of production and services in the High-Tech Park in Belarus was 1.4 trillion rubles in 2011 [405].

In 2014, the growth rate in the sector of information and communication technologies, in the telecommunications, in the postal sector in Azerbaijan totaled 13 %, compared with the 2013 according to the report of the Ministry of Communication and Information Technology [325; 347].

A similar situation was observed in Ukraine where in 2011 – 2016 the major segments of the industry of information and communications showed revenue growth [316; 319]. Thus, according to the National Commission, which performs state regulation in the sphere of communication and informatization, the growth rate of sales of communications services outstripped GDP growth (5.2 %) in 2011 and amounted to 6.0 % compared to 2010. It was for the first time that the amount of income in absolute terms had exceeded 50 billion USD and reached 50.3 billion USD. Services rendered to the population accounted for 37 % (or 18.4 billion UAH) of total revenues from communication services. It is 434 million UAH more than in 2010. By December 2016 the volume of revenues from communication services in the total income of the service sector of Ukraine amounted to 61.9 billion UAH and increased by 7 % in comparison with 2015. Revenues from the sale of telecommunication services to the citizens amounted to 33.9 billion UAH, which is 4.4 % more than in 2015 [316; 431].

Increased activity of operators in the broadband market and the introduction of new telecommunication technologies provided a growth in the number of users having access to the broadband Internet. It was the outpace

market growth of broadband which has become a major factor in increasing revenues of operators, including mobile operators.

The need to bridge the digital divide and provide access to universal broadband has been recognized on a global level in the context of major international global development goals, such as the millennium development goals, and objectives formulated at the World Summit on the Information Society. The Commission for Broadband Digital Development at its fourth meeting held in October 2011 in Geneva set the following objectives to be gained [321]:

objective 1: to make a universal policy in the field of broadband. By 2015, all countries should develop a national plan or strategy to ensure nationwide broadband, in compliance with the broadband concept included in their definition of universal access/service;

objective 2: to make broadband acceptable in terms of price, for example, the cost should not exceed 5 percent of the average GNI per capita;

objective 3: to connect homes to broadband. By 2015, 40 percent of households in the countries that are developing should have access to the Internet.

objective 4: to provide people's access to the Internet. By 2015, the number of Internet users should reach 60 % globally, 50 % in the countries that are developing and 15 % in the less developed ones.

Unfortunately not all the aims were realized, thus, 3.9 billion people, more than half the world's total population, are still offline [312].

The rapid technological progress in the West provides Ukraine, along with many other countries, with a chance to easily get the latest information tools and technologies (because of becoming cheaper on the world markets), but Ukraine is increasingly losing its ability to create them on its own and is lagging behind Europe in the development, implementation and putting into practice its own innovative technologies.

According to the report of the State Statistics Service of Ukraine, in 2014 – 2016, the number of enterprises and surveyed industrial companies engaged in innovation activities decreased (in 2010, it was 1 462 companies, or 13.8 %; in 2015, it amounted to 824 enterprises making 17.3 % of the total number) [316; 319; 326; 327]. Higher than average in Ukraine, was the share

of innovative enterprises in the gas extraction, production of ready-made metal products, food products, refined petroleum products, chemical, pharmaceutical and petrochemical industry; in terms of regions, it was at the industrial enterprises of Zaporizhzhia, Ivano-Frankivsk, Mykolaiv, Odesa, Sumy, Ternopil, Kharkiv, Kherson, Khmelnytski, Cherkasy, Chernivtsi, Chernihiv regions, Kyiv.

The number of companies spending money on innovation, increased by more than 17 %. The volume of innovation expenditures in 2015 amounted to 13.8 billion UAH (in 2010 it was 8.045 billion UAH) [316].

The report of the State Statistics Service of Ukraine [316] stated that the acquisition of machinery, equipment and software made almost three quarters of total innovation expenditures. In research and development (hereinafter R & D) the expenditures amounted to 1.1 billion UAH, 70 % of which was spent on research on their own. Another negative trend of 2016 is the reduction of export of innovative products supplied by companies in the amount of 2.62 billion UAH (against 13.7 billion UAH in 2010), more than 60 % of which was sold to CIS countries (in 2010 it was 58.8 %) [316].

It should be noted that the very model of market reforms effected in Ukraine in 1991, reproduces and increases the gap [24; 107; 234; 235]. Firstly, today, the same as in the past, much (if not most) of the domestic production is not oriented to the domestic market and in fact does not depend on the scale of consumption of industrial products within Ukraine itself. Secondly, the economy consumes productive investment but still is in a shortage of it (for example, investment in industry in 2010 was 55 384.4 million UAH, in 2015 it was 87 656 million UAH, in 2016 it amounted to 117 753.6 million UAH) [316]. Thirdly, the domestic industry does not currently produce most high technology consumer goods competitive even on the inside market. Tele- and radio sets are assembled from imported components, production of computer equipment, mobile telephony, satellite communication systems are not available, the domestic automotive industry depends on foreign investment. It is important, that the so-called "catch-up" development in contemporary Ukraine is complicated by the fact that the state is a net consumer rather than a net investor which is the case with most countries of Asia.

The position of countries in the modern world socio-economic space is defined by a large number of indicators, among which there are complex ones, even taking into account the level of development of the ICT sector and the level of human capital. Unfortunately, various world rankings indicate that Ukraine does not occupy a leading position (Tables 1 and 2).

Table 1

The position of Ukraine in the world ratings of information society assessment [425; 427; 428]

Ranking	Time period	Total number of countries	Ranking position
The World Economic Forum (WEF) Global Competitiveness Index	2012 – 2013	144	73
The WEF Networked Readiness Index	2013	144	73
	2014		81
The Economist Intelligence Unit (EIU) e-Readiness Ranking	2010	70	62
The UN Global e-Government Index	2012	190	68
	2014	192	87

Table 2

The UN Global e-Government Index, 2016 [430; 432]

Country rank	The UN Global e-Government Index	Components		
		The on-line service component	The telecommunications infrastructure component	The human capital component
Ukraine – 62	0.6076	0.5870	0.3968	0.8390
The United Kingdom of Great Britain and Northern Ireland – 1	0.9193	1.0000	0.8177	0.9402

In the global ranking of economic freedom Ukraine also ranks 162nd out of 178 (Table 3).

Table 3

The ranking of economic freedom, 2016 [428]

Country	Ranking position	Overall rating score	Business freedom score	Corruption freedom score
Honkong, China	1	88.6	97.4	87
Singapore	2	87.8	95.1	84
New Zealand	3	81.6	91.4	91
USA	11	75.4	84.7	74
Poland	39	69.3	68.7	61
Russia	153	50.6	72.2	27
Ukraine	162	46.8	56.8	26

It means that the state received the status of a repressive country. These data were provided by the experts of the Washington research center The Heritage Foundation [428].

In 1990 the UNDP published the first report of the assessment of economic and social progress in the world, in which the concept of human development was formulated: "Human development is a process of expanding the range of choices. The most important elements of choice are to live long and healthy lives, get an education and have a decent standard of living. Additional elements include the choice of political will, guaranteed human rights and self-respect".

A Human Development Index was also proposed. This system focused on improving the quality of human life, expansion and improvement of opportunities in all areas. The concept of human development has changed the "classical" theory of economic development that was based on the gross national product and the man considered only as a driving force of economic development and where economic growth was proclaimed the main objective of social progress.

Since 2010 the Human Development Index has been adjusted, so three new indices have been introduced: the Human Development Index, the Index of Gender Inequality and the Multidimensional Poverty Index adjusted for socio-economical inequality.

Ukraine has received the status of a country with a medium Human Development Index (Table 4) being the 83rd according to the Human Development Index of countries in 2014. Compared with the results of other CIS countries and the EU, Ukraine is an outsider, indicating the current need

for improvement and development of public regulation of the socio-economical sphere [428].

Table 4

The Human Development Index of countries, 2013 – 2014 [425]

Country	Ranking place		HDI	
	2012 – 2013	2013 – 2014	2012 – 2013	2013 – 2014
Countries with a very high Human Development Index				
Norway	1	1	0.943	0.944
Australia	2	2	0.931	0.933
Switzerland	3	3	0.916	0.917
USA	5	5	0.912	0.914
Countries with a high Human Development Index				
Russia	55	57	0.777	0.778
Countries with a medium Human Development Index				
Kazakhstan	69	70	0.755	0.757
Ukraine	78	83	0.733	0.734

The Global Competitiveness Index (the Growth Competitiveness Index) takes a special place in the world ranking. The list of primary data indicators increased to 152 in 2013 with the formation of the Growth Competitiveness Index, these data being total and partial and covering a wide range of factors affecting competitiveness, such as the labor market, the quality of infrastructure, education and health care, market volume. There are totally 12 groups and a separate zero group of values of GDP and population in the Index structure.

The distinguishing feature of this index is the ability to analyze varying indexes of the same factors considered in different countries. Comparative importance of particular factors for improvement of the country's competitiveness is the function of initial conditions, i.e. institutional and structural features that characterize the country compared to others as to the level of development in terms of the income per capita. Accordingly, countries can be divided into the following groups: factor-stimulated, efficiency-stimulated and stimulated by innovation performance. Ukraine ranked 79th in the Global Competitiveness Index in 2015 – 2016 (Table 5).

Table 5

The Global Competitiveness Index [425; 426]

Country	2011 – 2012	2012 – 2013	2014 – 2015		2015 – 2016	
	Ranking	Ranking	Ranking	Score	Ranking	Score
Switzerland	1	1	1	5.7	1	5.76
Singapore	2	2	2	5.6	2	5.68
USA	5	7	3	5.5	3	5.61
Finland	4	3	4	5.5	8	5.45
China	26	29	28	4.9	28	4.49
Kazakhstan	72	51	50	4.4	42	4.49
Russia	66	67	53	4.4	45	4.44
Ukraine	82	73	76	4.1	79	4.03

There is a need to consider the group of the global competitiveness indexes characterizing the ICT sector (Tables 6 and 7). First, in the global competitiveness index there is a selected group of indicators 9.B "The Use of ICT" (9.B ICT use), but at the same time additional options related to communications and information technologies or products are determined. Thus, the value of the indicator "Internet access in schools" is estimated, which is included in 5.B "Quality of education".

Table 6

The indicators of the global competitiveness index that deal with ICT, 2012 – 2013 [425]

Indicator	Ukraine		Russia		USA		Period	Best country, score
	Ranking	Score	Ranking	Score	Ranking	Score		
1	2	3	4	5	6	7	8	9
2.B Electricity and telephony infrastructure, 1 – 7 (best)	60	4.6	49	4.9	21	5.9	2013	Hong Kong SAR / 6.88
2,07 Quality of electricity supply, 1 – 7 (best)	78	4.6	84	4.3	33	6.0	2013	Netherlands / 6.8
2,08 Mobile telephone subscriptions/100 pop	43	123.0	5	179.3	72	105.9	2011	Hong Kong SAR / 209.64

Table 6 (the end)

1	2	3	4	5	6	7	8	9
2,09 Fixed telephone lines/100 pop.	45	28.1	41	30.9	15	47.9	2011	Taiwan, China / 72.68
5,06 Internet access in schools, 1 – 7 (best)	62	4.4	70	4.2	24	5.7	2013	Iceland / 6.51
9.B ICT use, 1 – 7 (best)	77	2.7	35	4.6	11	6.0	2013	Denmark / 6.69
9,04 Individuals using the Internet, %	88	30.6	57	49.0	20	77.9	2011	Iceland / 95.02
9,05 Broadband Internet subscriptions/100 pop.	69	7.0	47	12.2	17	28.7	2011	Hong Kong SAR / 42.61
9,06 Int'l Internet bandwidth, kb/s per user	86	9.8	44	31.9	33	47.2	2011	Hong Kong SAR / 964.62
9,07 Mobile broadband subscriptions/100 pop.	84	4.4	17	47.9	8	65.5	2011	Singapore / 110.94
0,01 GDP (US$ billion)	55	165.0	9	1850.4	1	15094.0	2011	United States / 15094.03
0,02 Population (million)	27	46.8	9	147.1	3	325.1	2011	China / 1366.96

Table 7

The indicators of the global competitiveness index that deal with ICT, 2014 – 2015 [426]

Indicator	Ukraine		Russia		USA		Period	Best country, score
	Ranking	Score	Ranking	Score	Ranking	Score		
1	2	3	4	5	6	7	8	9
2.B Electricity and telephony infrastructure, 1 – 7 (best)	51	5.1	49	4.9	21	5.9	2014 – 2015	Hong Kong SAR / 6.88
2,07 Quality of electricity supply, 1 – 7 (best)	69	4.9	84	4.3	33	6.0	2013 – 2014	Netherlands / 6.8

Table 7 (the end)

1	2	3	4	5	6	7	8	9
2,08 Mobile telephone subscriptions/100 pop.	33	138.1	5	179.3	72	105.9	2013	Hong Kong SAR / 209.64
2,09 Fixed telephone lines/100 pop.	45	26.2	41	30.9	15	47.9	2013	Taiwan, China / 72.68
5,06 Internet access in schools, 1 – 7 (best)	67	4.3	70	4.2	24	5.7	2013 – 2014	Iceland / 6.51
9.B ICT use, 1 – 7 (best)	69	3	35	4.6	11	6.0	2014 – 2015	Denmark / 6.69
9,04 Individuals using the Internet, %	82	41.8	57	49.0	20	77.9	2013	Iceland / 95.02
9,05 Broadband Internet subscriptions/100 pop.	68	8.8	47	12.2	17	28.7	2013	Hong Kong SAR / 42.61
9,06 Int'l Internet bandwidth, kb/s per user	50	52 882.6	44	31.9	33	47.2	2013	Hong Kong SAR / 964.62
9,07 Mobile broadband subscriptions/100 pop.	107	5.4	17	47.9	8	65.5	2012	Singapore / 110.94
0,01 GDP (US $ billions)	41	177.8	9	1 850.4	1	15 094.0	2011	United States / 15094.03
0,02 Population (millions)	27	45.7	9	147.1	3	325.1	2011	China / 1366.96

The analysis of the above data shows that Ukraine as a whole improved its position in the rating. In the press release of the Interregional Forum of the International Telecommunication Union held in September 2012 it was also stated that the ICT industry in Ukraine demonstrated positive dynamics. Thus, in 2011 the income from the sale of communication services amounted to 50.3 billion UAH, which is 6.0 % more compared to the previous year. The statistical data [316] on the volume of sales of Ukraine's regions (Fig. 1 and 2) indicate that the telecommunication sector of the economy has been growing rapidly, sometimes even surpassing the performance of some sectors.

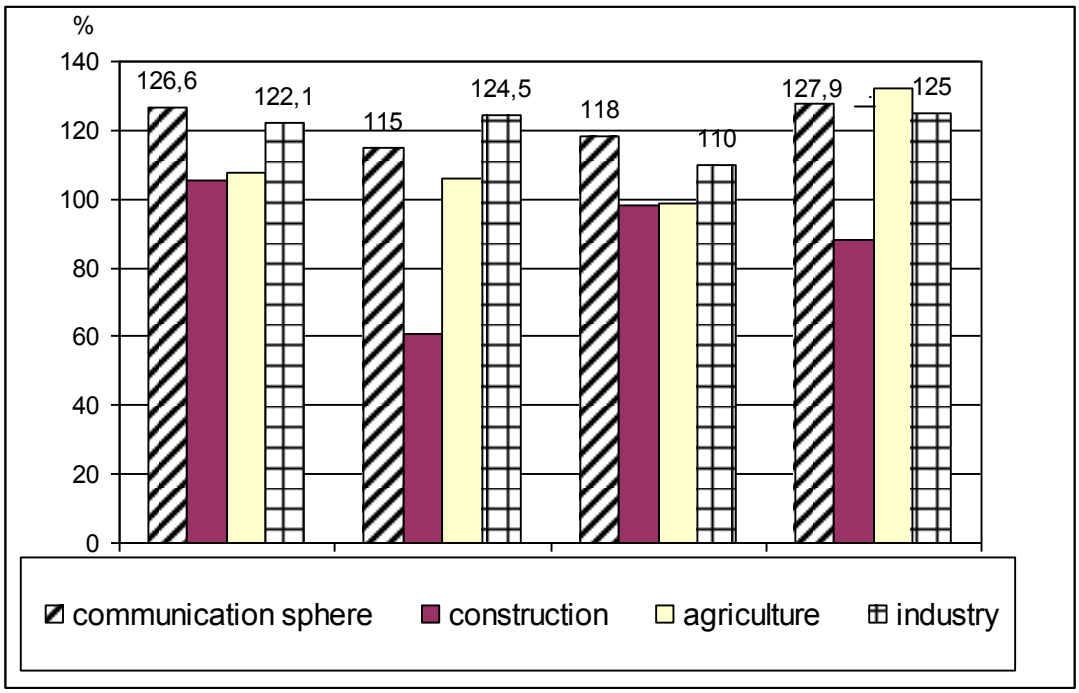

Fig. 1. **The sectoral dynamics of change in the index of sales of products (goods, services) in Ukraine** (according to the CIEA data, quarters of 2005)

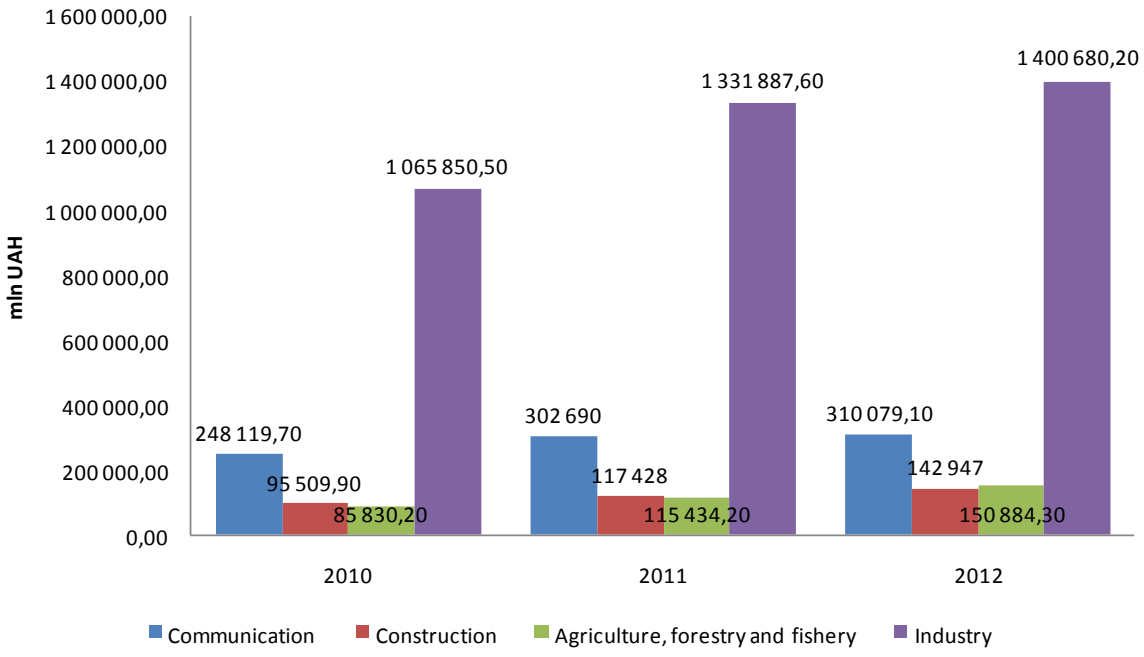

Fig. 2. **The sectoral dynamics of sales (goods, services) in Ukraine** (the CIEA data, 2010 – 2012)

Analysis of the sectoral dynamics of sales (goods, services) in million UAH in Ukraine (the CIEA data, 2010 – 2012) shows that the communications sector in the absolute value is ahead of construction and agriculture. This demonstrates the undoubted leadership of the communications sector in the economy of Ukraine.

Revenue growth was recorded in 2011 – 2012 in the major segments of the telecommunication industry. Thus, according to the National Commission that provides State Regulation of Communications and Informatization, the growth rate of sales of communication services outstripped the GDP growth (5.2 %) and amounted to 6.0 % in 2011 compared to 2010. In absolute terms, the amount of income for the first time exceeded 50 billion UAH and reached 50.3 billion UAH. Services rendered to the population, accounted for 37 % (or 18.4 billion) of the total revenues from services. It is 434 million UAH more than in 2010 [316].

By 2012 the volume of the revenue from the services and communication areas of informatisation in the total revenues of the service sector amounted to 23 % of Ukraine, or about 62 billion UAH and increased by 6.7 % in comparison with 2011. Revenues from the sale of communication services amounted to 52.3 billion UAH, which is 4 % (or 2 billion) more than in 2011 [316].

Despite the fact that according to the latest report on the global competitiveness made by the World Economic Forum in Davos (WEF), Ukraine climbed nine positions higher – from 82d in 2011 to 79th in 2016, its performance relative to the level of ICT development requires substantial improvement.

In these circumstances, the development of the communication sphere can solve pressing problems in Ukraine, but it will not make Ukraine a postindustrial state. Today, a significant part of the national wealth of postindustrial countries is represented by intellectual capital of their citizens, intellect-intensive production and a developed infrastructure of services.

The formation of Ukraine as a postindustrial country is determined by certain peculiarities [47; 55; 66; 80; 104; 164; 172; 211; 229; 234; 235; 251]. It has universal, but outdated production capacity, certain natural resources, significant domestic market and skilled labor. All these important qualities are

associated with past industrial achievements of the region that is why modern Ukraine needs investments in innovative technologies and creation of conditions for Ukraine's integration into the information society. The political and economic elite of Ukraine should focus on the improvement of products able to compete with foreign analogues, more active formation and development of the intellectual potential of the nation, development of the communications activities. It is necessary to create conditions of information and economic openness attractive for foreign investors who should create new production capacities rather than extract local natural raw materials.

Ukraine must naturally integrate into the global economy, increasing the GDP share of industrial sectors that make the end-consumer products, and reducing the share of mining and resource industries. Finished products produced domestically should replace products of the raw sector and become the main source of domestic exports. In the shortage of financial resources Ukraine must support the goals and objectives that will have obvious technological and innovation priority. Such policy would rearm the domestic production, provide new technological developments in the industry and agriculture, get rid of dependence on imports of consumer goods and food. In the longer term the economic complex of Ukraine, as that of the majority of the preindustrial and industrial formation can transfer to a postindustrial one, and this will only become the basis for our country's entering in the information age commonwealth of countries.

It can be concluded from the above that the proponents of the postindustrial theory often note some methodological difficulty in clearly defining certain types of society and especially their chronological boundaries. Even the detailed definitions of the Information Society have no clear indication of its fundamental characteristics. The definition of the chronological framework of each socio-economic structure is rather complicated. Despite the argues that new trends began to grow after World War II, most often it happened in the forms that make it possible to speak about the expansion of industrialism. If the degree of development of the tertiary sector is used as a criterion, then the mid-1950s of the twentieth century make a critical point, when the number of US service workers exceeded the number of employees in the material production. However, the real change that let

most researchers indicate a new stage of development of society, i.e. the information (postindustrial) one, occurred by the 1970s and included a radical acceleration of the technological progress, the emergence of the Internet system, the development of computers, rapid changes in the structure of employment, new mentality in the majority of the population.

Thus, although the information economy can be considered as a type of society which opens a new era in the historical development, the reality of the postindustrial trend does not replace the previous socio-economic formations as stages of social evolution. They coexist deepening the complexity of society and the nature of the social structure.

In terms of understanding the processes that are actually taking place in the modern information society, a significant contribution was made by Tom Stonier [300] and John Naisbitt [287]. Scientists think that the most likely outcome of social development in the near future is the integration of existing systems with new personal and mass communication means, increasing electronic technology, active informatization of society. The development of the new information order does not mean the disappearance of industrial society. Rather, there is a probability of establishing a total electronic control over technological processes, data banks, production processes and consumption. Information, having become the staple product, simultaneously turns into a power resource, whose concentration in one source could potentially lead to the emergence of a new variant of totalitarian rule. Even Western futurologists (J. Masuda [285], A. Toffler [301]) who predict a certain future transformation of the social order in connection with the development of communication activities do not exclude this possibility. Another prerequisite for a society of total communication and as a result, total electronic control is the speed of interchange with informational messages, an instant opportunity of comprehensive mass awareness inherent in modern life that is mass influence. In turn, B. Gates is very optimistic about the development of information society in his book "The Way to the Future" [34]. It underlines that over time, the number of employed and the diversity of professions in education, social security and entertainment will increase.

Chapter 2
The nature of interrelation of categories of information, communication and management

We live in a world that is rapidly changing and becoming complicated. All the more numerous, diverse and interdependent are the factors that have to be considered when making any decisions. Increasingly apart in time and space are often unexpected consequences. In figurative expression of the academician A. I. Berg [15], "information penetrates into all pores of life and society, and life is impossible in an information vacuum".

Translated from Latin, "informatio" is clarification, statement, that is data (or their combination) concerning objects, phenomena and processes of the world. Today, there is no established and comprehensive interpretation of the term. Therefore, the author considers the evolution of this concept, beginning with the analysis of the philosophers' researches.

It is known that there was a period of confrontation between materialism and idealism on the problem of the definition of the concept "information". Thus, in cybernetics scientists try to "dissolve" the matter in information, emphasizing at the same time that information is the identification of "pure movement". L. Kershner assures that one-third of the world is covered by the concept of information that it is neither matter nor energy [278]. A more sophisticated idealistic interpretation of the concept of information is offered by the known researcher Carl Friedrich von Weizsäeker, who describes it through another concept, the form, i.e. states that mass and energy are equivalent pieces of information [305].

After N. Wiener most of the Western authors that directly or indirectly deal with philosophical and methodological studies of cybernetics, started to talk about information as a factor that supposedly indicates the possibility of getting away from the existing dilemma "materialism – idealism". A typical expression "an odd man out" in philosophy, comes to neither materialism nor idealism, but there is so-called three-digit metaphysics, declaring information to be some third, "neutral", "intermediate" between spirit and matter.

Some philosophers who hold the positions of Marxist-Leninist philosophy, have attempted to correlate the information with the notion of

representation, revealing at the same time the need for unity of representation and interaction as a dialectical unity of polar categories [53; 108; 109; 256; 258]. That refers to the first concept of information that still takes place [10].

It is well known that nature history science of the 19th century really reduced all the relationships between things to interaction, and more than that, to a well-known at that time formula of interaction – the physical one, and in many cases even to mechanical, or force interaction. In quantum theory a special type of communication was discovered that is not reduced to force interaction, although V. A. Fok, for example, calls it interaction, adding the epithet "instant change" [403, p. 462]. Namely this connection unknown to the natural history of the 19th century or non-force interaction is in the basis of the phenomena described by the concepts of representation and information.

This treatment is not so far from the modern interpretation of the concept "representation". It is about complementarity (relative to the idea of complementarity by N. Bohr) of two ways to describe physical reality: causal-dynamic and information. This is described by V. A. Fok in his article where he states that to express the specific non-forcible interaction, one must bear in mind not just the stochastic process but a special process, accompanied by information, which should be paid at the cost of entropy in the relevant no-turn processes [403].

There is a second concept of information which is, according to many scientists, a more fruitful approach to the problem of information – a "varied" concept of information. Under this approach, information can be interpreted as "withdrawn" indistinguishability, as diversity. It is emphasized that information is available wherever there is diversity, heterogeneity. Information "appears" if at least two aggregate "elements" are different, and it "disappears" when objects get "stuck", "identical" [10].

Many authors use in their research the definitions of information given in the encyclopedia: "information is data transmitted by people orally, in the written form or otherwise" [18; 51; 206; 223; 257; 258]. At the same time, a more generalized systemic concept is considered here: "Information is a general scientific concept that includes the exchange of information between people, man and machine, machine and machine; exchange of signals in the animal and plant world; transfer of characteristics from cell to cell, from organism to organism" [18; 51; 206; 223; 257; 258]. It should be noted that

these two definitions are characterized by a common inner essence, which gives reason to use them for various systems.

The development of science and its computerization determine the evolution of the concept of information. One of the first definitions of information concerning the "computer age" belongs to N. Wiener: "Information is a designation of the meaning, derived from the outside world in the process of our adaptation to it, and the adaption of our senses to it. The process of obtaining and using information is a process of adaptation to the randomness of our environment and our vital activity in this sphere" [28].

The researchers of this problem believe that this definition does not indicate the object whose content information represents, its nature and origin of the material basis. In this regard it should be noted that it is the displaying category that was the key that made it possible to open the secret of the nature of information; this is a philosophical category which was methodologically fruitful to penetrate its essence. So, in this philosophical concept information is understood as a means to "remove uncertainty" (entropy) of a particular event, a particular object of cognition.

Further development of science was also linked to the success of the statistical information theory and a rapid take-off of cybernetics. So, it is natural that the concept of information has been transformed and has acquired the status of a general scientific concept and at the same time has fallen under the process of "inflation". First, information was associated with the measure of elimination of uncertainty about the specified number of possible outcomes or events. It was determined based on the ratio of a priori and a posteriori knowledge of an individual of this number in connection with reports regarding the outcomes.

Then a broader interpretation of information as some knowledge in general was stated in literature. It should be assumed that it reduces uncertainty, but it is not always possible to determine how many outcomes or events are meant, what the ratio of a priori and a posteriori knowledge is, which reports the provided information is related to. In cases where reports are considered irrelevant of whether they change or not the knowledge of the individual, the term "data" can be used. Thus, data is a reflection of the condition of an object; it may have information for the individual or not,

supplement his knowledge of the object, but that is another issue. Finally, neither the concept "information" nor the concept "data" make it possible to determine how important to the individual the relevant knowledge is, that is to set the value or usefulness of the information. Its pragmatic assessment is only possible in relation to the internal state or behavior, the goals of the individual.

It would be a mistake to assume that only the scientific component of the real determines the development of the concept of information. The objective fact is that this process is dialectically linked to the development of a particular society. In Ukraine, a democratic, social, legal society is developing and strengthening, that is why it could not but be reflected in the perception of information.

In the author's opinion, it will be methodologically correct to define the following phase of the research on the concept of information: analysis of its structure, content and features. It is appropriate and useful to describe this information model based on an individual that sets a socio-economic task and then carries it out. Suppose, an individual is a system (a person, a group, an institution, an automated device), which has a target, sets and completes relevant tasks. The proposed information model of an individual reflects the results of much psychological and social research in this area conducted by such scientists as, for instance, O. Leontiev, N. Amosov, J. Levada, A. Mole [2; 95; 98 – 101; 116].

All the sectors of the models interact with each other and are connected with the environment. The environment is not strictly divided and all types of information, intertwined with each other in the flow of messages, get to various units of the model.

An individual is constantly immersed in the information environment, and all the time he accumulates, modifies and improves basic information i.e., the information that he has regardless of the decision-making process (DMP). It is completed due to the implementation of the made decisions, evaluation of the results [16; 25; 32; 308; 309].

In addition, each decision making is connected with a special flow of current information. It can be regular, i.e. systematically arriving at certain times; usually regular current information feeds the standard periodically

recurring DMP. Current information can be one-time. Then it is collected specially for a particular decision making and either completes regular information in the case of significant changes in the conditions that are not covered by standard data, or is associated with unique decision making.

It should be noted that many studies on information systems in planning and management are usually focused on the current regular information, and only that which is recorded in documents. At best it is viewed as one-time information collected in the form of "question – answer" in various databases. Undocumented current information (phone calls, personal contacts, meetings), as well as all basic information in fact remains outside the purview of specialists in information systems management. It should be noted that in the management information systems basic and current undocumented information should play a primary role in the DMP.

For a more complete and deep analysis of the concept of information it is more expedient to highlight the issues that are associated with basic and current information [9; 40; 54; 88].

Basic information is formed by the individual and it is extremely diverse in its content. It serves primarily as information representation of all social relations in which the individual performed before and performs now. Therefore, it contains intertwined socio-political, economic, ethical and aesthetic, scientific-theoretical and technical-technological information, information about the environment and so on. Social relations of production play a decisive role in the complex of relationships whose intersection determines the social position of the individual, his place in the system of social production. Recognition of the major role of the socio-economic and overall sociogenic factors in shaping basic information does not deny the value of biological and psychogenic elements of personality, first of all as factors of individual "refraction" and interpretation of social information, the degree of conformity of the individual.

Basic information is formed and integrated from three main sources. First, it comes from public macrosystems (state, public organizations, mass media, the education system) as an array of knowledge, worldview, legal regulations, government directives, etc. Second, it comes from small groups, which the individual is directly related to through various lines (family, the

employment group, the reference group, school, social work, the circle of friends, etc.); through keeping to private behavioral rules, specific interests and acquisition of knowledge. Third, physiological factors and characteristics of the individual determine his temperament, sensitivity, the structure of emotions. Thus, in the temporary aspect, basic information of the individual, so to say, synthesizes universal and collective historical experience, individual experience and hereditary genetic information.

The author assumes that the information received by the individual, appears as if in some "encyclopedia". It should be noted that a similar conclusion was drawn by the scientist A. Mole, who believed that such information is projected to the "screen of knowledge" of the individual which is of a different scope and performance with different people [116]. The concept of the "screen of knowledge" is substantially similar to the concept of thesaurus in the sense in which it is used by Y. A. Schrader [255]. It should be noted that the volume of the "screen of knowledge" is determined by the number of elements while its performance depends on the capability for associations, changes in the structure of knowledge (accordingly, the first characteristic is associated with erudition, and the second one describes the creative abilities of the individual). Comprehensive consideration of these factors is important in the analyses of the basic information used to solve complex social and economic problems.

Social programs of behavior are deeply heterogeneous not only in the content but also in their internal structure. Y. A. Levada distinguishes two types of programs: traditional and rational ones [95]. These programs are the result of training, but in the first case it is normal, and in the second one it is adaptive.

At the stage of receiving data, the individual's orientation "constructs" a kind of barrier, a filter for the external information flow to prevent from drowning in this flow. That is, they are caused by the limited capacity of the individual as a channel of information. Therefore, each DMP gets far from all the information that may be useful during the development of the objectives and the relevant decision. In this respect, a lot depends on the quality of the filter.

With regard to the current information, it basically updates the setting of specific socio-economic problems acting as a stimulant of this setting. Simultaneously basic information is activated and mobilized being "drawn" and grouped around the situations and problems by current information. Generally, there are two main types of current information, the "object" and "subjective" ones.

"Object" information comes in the regular or one-off order from the object of observation (in the broad sense, including both the directly controlled object and another external environment). In the socio-economic information regular information is still prevailing. In general, "object" information is usually determined, one might even say "programmed" by the observer – in the scope, content, time of coming and so on. It represents the characteristics of the object, but also has a stimulating effect on the individual, for example putting him on decision-making in extremal situations.

"Subjective" information is focused on the definition or change of any characteristics of the individual, his/her motives, attitudes and actions. Typically, it is not "programmed" by the individual (in terms of volume, time, content), but it rather depends on the outer factors affecting him. Even when the "subjective" information contains regulatory characteristics of the object controlled by the individual (e.g., policy targets), it is addressed not to the object, but to the individual or the collective, which shall ensure compliance with the specified characteristics. The said feature is important because it provides stimulating nature to any "subjective" information. In practice, sometimes this feature of address targets that have to be coordinated with other stimulating effects is not taken into account.

"Subjective" information primarily comes in the form of binding directives (targets, orders, instructions, legal rules with compulsory interpretation, etc.). It is usually based on the administrative or some other form of subordination of the individual to a corresponding formal social institution and involves clearly defined sanctions for deviant behavior. In terms of informal relations, the individual also receives a significant amount of "subjective" information (e.g. thoughts of competent people about a situation or problem). Mass media radically increase the proportion and the value of this flow in shaping both the basic and current information. Moreover, they do not only convey it, but also

create authorities, especially for a conformal type of behavior. There is also a third source, namely, the individual's own inner intents and motivations. They are usually of minor, induced nature and result from the relevant background information (motives, emotions, attitudes of the individual) updated under the influence of current events. However, in some cases, they can occur spontaneously, or at least significantly deviate from the general structure of the stereotype. Similar phenomena are sometimes found in so-called extreme stress situations with a very high "pain" potential for a particular individual.

Let's focus on another important aspect, i.e. informational features of socialization of the individual [96; 106; 113; 129; 130; 137; 139; 144; 154; 158]. The problem of socialization of the individual is one of the central problems in sociology and social psychology. The process of the individual's involvement in the network of public relations, displaying his social position is generally carried out through various communication channels. In class society this process in a broad sense has a distinct class character that defines the content of the information that ensures socialization of the individual. Some of its important types, i.e. basic and current, have already been described. Motives and attitudes, behavioral patterns, not only traditional but also rational programs in the basic information of the individual, a set of assessments and criteria – all this is the result of socialization of the individual, and is crucially determined by his social position in society.

The author offers a brief characteristic of three main methods of the information influence on the socialization process for further analysis of management processes, including decision making. In the author's opinion, these effects could be reduced to two types of signals: "painful" and "neutral". J. Kornai wrote about the "monopoly of order" and the "monopoly on information" that can be interpreted as the actual concentrates of "painful-" and "neutral-" informing influences on the individual [87].

The author considers it appropriate to try to distinguish the response to the following three categories: order, appeal to the interest and neutral information. However, they are not completely separated from each other, in fact, each message that comes to the individual, combines all the three types in various ratios. Therefore, the message (a document named "order")

actually contains impulses that appeal to the interest of the executor (violation of orders usually assumes entirely "painful" sanctions while timely carrying them out is associated with a particular promotion). As a rule, in the same message there is a variety of information that is essential for understanding and implementation of certain provisions of the order by the executor, that is neutral information.

The difference between these three methods of information influence is associated with the structure of social relations which the individual fits in the process of socialization. The order presupposes the existence of a formal organization with internal relationships of power and subordination. These relationships are formed and governed by a specific supervisory unit that identifies itself with the goals of the organization. Thus, the order specifies the "vertical" relationship and subordination within the organization. Such an order can have impact of informal moral or scientific credibility in a separate way, and even internal motivation of personality. Naturally, the provision of the order monopoly, in which there would be no conflicting or contradictory policy effects, increases the effectiveness of this method.

An appeal to the interest ("incentives") is not limited to the vertical organizational power and subordination. It can be equally transmitted "top-down", by other individuals and organizations that operate independently, and to some extent, "bottom up" by subordinates. It is essential that information always involves stimulating internal identification of the individual and his interests with those actions that explicitly or implicitly stimulated reply. Any-way the generator and the transmitter of information are "trying" to simulate the individual reactions to stimuli and out of this model.

Neutral information includes all other messages that suggest neither power, nor interest as a factor that gives rise to it. If the orders and incentives are designed for a definite, specific target (an individual or a group), the neutral message can be clearly non-directional. Examples are the actual messages published to inform – statistical reports, patents, weather reports and more. Nevertheless, it is still only a theory. In fact, this information is often not neutral for the process of management, especially in the presence of a "monopoly on information" – no matter whether such a monopoly was enshrined by a formal organization or it has developed informally (for

example, by the concentration of the media). In this case, supposedly neutral information forms the orientation of the individual and can play a pivotal catalytic role.

Characteristics of the order, the stimulus and neutral information are associated with external factors of social activity of the individual observed, and crucially conditioned by his social position in society and are formed under the influence of a certain social genotype to be described further.

It should be noted, that not all the features of information have been considered and analyzed. Research on the ideas about the nature of the category "management" will contribute to the development of this process [23; 48; 64; 114; 135; 148; 173; 179; 180; 187; 188; 214; 215; 239; 250; 318; 404].

The concept of governance today has so organically entered the language practice that it may seem that modern science has quite clear, unambiguous understanding of the nature of management, a high degree of certainty and scrutiny. However, a critical assessment of the real state of affairs shows that one cannot speak so far about the existence of a single, securely developed image of the analyzed phenomenon, i.e. a generalized model of governance, which is set at the level of its most essential features.

All this makes very important the task of clarifying the modern scientific knowledge of ideas about the nature of management, especially given the ambiguity of the concept of governance stated in science. In what cases does the question of the use of the concept of control arise today?

The concept of management combines several different meanings. So, well known, but scientifically less interesting is the use of the term describing the management entity (a company, an institution) which manages. More interesting is the case when management means the type of syntactic context in which the "pivotal" word determines the form of subordinate words. This understanding, which is regarded by some researchers as "traditional", should of course, be borne in mind in the further development of management issues.

In modern science, the idea of management was stated as a very specific effect of one object on another, which is not observed everywhere in the universe, but is only characteristic of the objects of nature, in technical systems and in society. Given the commonality of features that are inherent in all such systems, they were attributed to a single class of "management

systems" that are seen as composed of "controlling" and "controlled" subsystems (in another version of "controlling systems" and "managed objects"), the cooperation of these subsystems providing the management processes. The notion of control in this particular interpretation should be discussed in more detail, especially as without some additional defining of this concept it is almost impossible to select the researched type of dependencies out of a great variety of types that occur.

Introduction to scientific literature which deals with management issues shows that today rather full clarification of what management constitutes is related to two tasks. First, it is the definition of a complete set of essential features that distinguish management processes from other processes; second, it is the specification of these very attributes. Setting the first task is conditioned by the fact that there is no general definition of management in categorical terms. Besides, solving this problem is complicated by the fact that the current opinions about the content of the management processes are usually rather vague, focused on some management features that are primarily interesting to a corresponding researcher.

Thus, some experts see management as a process of information processing; for others it is the process of converting information into action; finally, others believe that the concept of management may be described as influence on the object storage system to an existing condition or transfer from one state to another, regardless of whether it occurs in nature or in public life.

Comparison of common definitions of the concept which is analyzed leads to the conclusion that the fundamental characteristics of the management processes of today are the following features: the targeted control actions necessarily have the informative character and are implemented under the feedback scheme. Of course, the completeness of the selected features is in doubt, but the idea of management as a purposeful information influence of a control subsystem on a managed subsystem, between which there is feedback, basically makes it possible to bring many well-known definitions of management to a common standard, however, after appropriate correction of the content that is read in each concept used in the definition. The latter reservation is needed because unity in understanding the main features only concerns the phenomenon of feedback.

As has already been mentioned, the relationship between the managing and managed subsystems is not limited to the impact of the former on the latter. Most of the studied systems of management are characterized by a complex relationship of their subsystems, in which the formation of control actions directly affects the state of the respective managed object. This effect is achieved by the system' having not only the direct connections through which the managing influence is exerted, but also a so-called "feedback" that makes it possible for the controlled subsystem to effect the controlling one. Depending on whether the feedback stimulates changes that occur in the managed objects, or suppresses them, the feedback can be positive or negative.

The accuracy of controlling actions turns to be related to the accuracy of our ideas about purposefulness and informativeness. In the author's opinion, one should start with the fact that reference to purposefulness in the definition of control in fact does not work beyond the analysis of purposeful activity. This is due to the fact that philosophical tradition involves the use of the term "purpose" and its derivatives only in respect to human activity.

According to some scientists, it is useful to introduce the concept of a dominant process, a process which is determined by the essential nature of the features of the system in which it is carried out [13; 42; 61; 168; 216]. This provides a possibility of building a single logic of control processes in the objects of various nature without artificial expanding the scope of definitions of purpose and purposefulness. From the author's viewpoint, it is advisable to work in two directions. Firstly, it is necessary to analyze the concepts expressed by such, in fact, synonymous words as "focus", "desire" and "trend". So far one can only speak about a very preliminary, mostly intuitive understanding of the nature of the phenomena expressed by it. Secondly, it is desirable to identify the way of the analysis of numerous definitions of control that would create the possibility of determining sustainable features of management in objects of various nature, describing the attribute of orientation of control actions. This approach is especially fruitful today because it provides a number of interesting findings.

Thus, according to almost a general belief it appears that all the known control systems today are generally characterized by two stable features:

negentropy, that is the ability not to deteriorate and even to progressively evolve, and the tendency to optimization of internal processes that is the focus on the achievement of the condition, wherein the values of the parameters most contribute to its maintenance and development. In other words, negentropy and optimality are currently regarded as essentially defining dominants of the management processes that occur in nature and society. On this occasion, one can refer to a very authoritative statement of both cybernetists, and philosophers who have been developing philosophical questions of the science of management.

As noted in these statements, in general, it is now clear that the unity of diverse management processes is that they are all characterized by accurate quantitative measure – a decrease of entropy, that the process is the antithesis of management processes disorganization and that the higher ultimate goal of control, resulting in very general terms, is to optimize the system, make the best beneficial effects for the least effort and cost.

These features of management processes are in fact sufficiently well known. Moreover, in the scientific literature the definition is proposed that management as a process of ordering a system, and cybernetics is regarded as a science about not just focused, but also optimal managing complex systems and processes. However, there are researchers who either underestimate or overestimate this dominance of management processes. To decide on the possibility of reducing the two dominants to the rank of axiomatic ones, that is to believe them to be fundamental in the science of management, one will have to consider the real nature of the determination of management processes in more detail.

With limited and unilateral approaches, the researchers ignore the fact that the management system and the managed object form a strong integrity, i.e. a "self-managed system" that can only be divided into parts in abstraction. It is due to this fact that one could argue that the dominant of control is given by the whole system of management rather than by one of its subsystems.

Given the differences in the determination of control processes at the level of a self-governing system and at the level of its subsystems, it is appropriate to introduce the concepts of integral management and local control. Local influential actions are conditioned by the peculiarities of the

respective subsystems, but ultimately decisive for them become the properties of the integrated systems. The integrated systems will include those ones which are not subsystems of any of the natural system. Out of a great variety of social systems, only social organisms, that is some particular societies, can be categorized with some degree of approximation as integrated ones, because these systems are to be regarded as independent units of social reality. In fact, such social community as mankind can only claim the status of the initial one for the analysis of social processes of managing an integrated system.

The clarification made above leads to the conclusion that the orientation to negentropy and optimization of impact can really be considered significant dominants of the management processes that determine the general direction of these processes, especially at the level of integrated management systems. Negentropy and optimization as dominant management processes are quite clearly expressed in the self-managed social systems. The focus of these changes, viewed in the history of human society, is in favor of the discussed thesis.

There is no reason to believe that the two dominants considered fully exhaust even the most general ideas about the trend of management systems of different nature. The analysis of the concept of dominance administration did not touch upon the fundamental questions about the specific form of the determination of the management processes, which manage real self-governing systems and this fact should be kept in mind when research goes beyond the usual approach to the study of natural phenomena.

It should be noted that negentropy and optimization phenomena occur in such objects that are not usually associated with management mechanisms. As an example, one could mention the arbitrary crystal growth. If we want to separate cybernetic management processes proper from those processes (as shown above), which are not such, another significant attribute preconditioned by the term "the information mode of management" should be used.

It is this term that experts usually imply when they say that government is ordering exercised through processing of information or that the management process is always a process of information. In this regard, crucial for the understanding of management processes is an adequate understanding of

information, information and control actions. In turn, information control action can be realized only through the process of communication.

Communication as one of the most common and most intensively used terms – like all concepts with the broadest scope – is the most abstract one out of a number of related terms. It is therefore necessary to propose the criteria which the author chooses for key information in the separation process of communication. The subject-subject relationship in communication, the subject-object in the information model – that is the difference which is crucial to further research in the context of implementation of recommendations for state regulation of communications activities.

To draw a clear distinction between information and communication models of sharing data, the author defined the basic criterion which is the vector of relations: the subject-object, monological one-way communication describes the information model, and the subject-subjective, dialogical interrelation with feedback, determines the communication model. The author believes that any information model in dynamics is the first step of the communication model [138; 141; 288; 289] (Fig. 3).

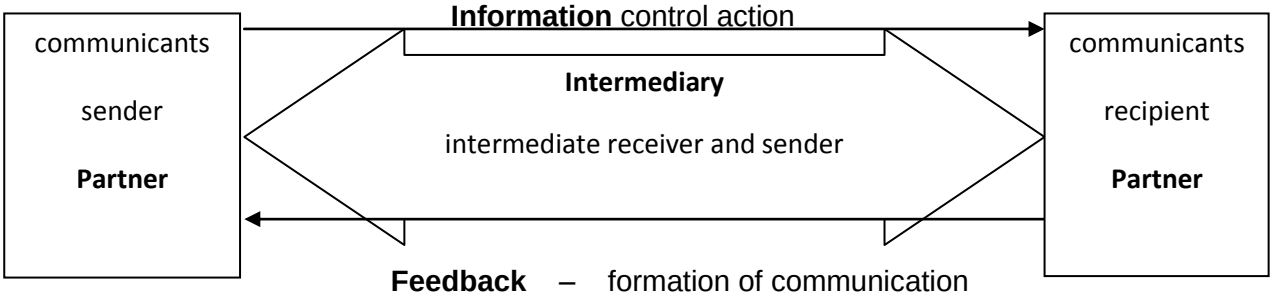

Fig. 3. **The information and communication model of a control action**

The nature of the information and communication exchange depends on the characteristics of the subject of the process. For example, a creature has consciousness, a motivational sphere, while the inanimate has an algorithm of reactions.

Defining communication as a phenomenon with certain characteristics or a process with certain stages, each scientific field focuses on the phase and properties of communication, their own respective subject area. Using

the classification of scientific and technological activities adopted in Ukraine and published in the State Classifier of Ukraine "Classification of Scientific and Technical Activities DK 015-97" [317] the author has selected characteristics of understanding of the category "communication" in various scientific fields [3; 4; 6; 18 – 20; 27; 44; 52; 56; 68; 83 – 85; 94; 97; 102; 115; 138; 141; 145; 152; 153; 159; 163; 165; 166; 177; 178; 185; 189; 226; 252; 256] (Table 8).

Table 8

The multidimensional assessment of the category of communication
(developed by the author)

The field of knowledge	The features assessed (highlighted by the author)	The definitions of the concept "communication"
Philosophy (see "Communicative Philosophy")	Belonging to a social group	The category which means communication by which the "I" finds himself in another one
Technical sciences (ergonomics, instrumentation, electronics, radio engineering and telecommunication)	Providing information and its loss	Sharing values (information) between individuals through a common system of symbols (signs) of language signs
Humanitarian sciences (history, philology, linguistics, art)	Transferring the content	Transfer of contents, values, culture, traditions
Social sciences (economics, psychology, sociology, ethics, entrepreneurship, management)	Meeting the needs	Contacts, communication, information exchange and human interaction with one another
	Achieving goals, effectiveness, efficiency	Remedy message and communication, information contacts
Natural sciences (mathematics, chemistry, physics, biology)	The level of mutual adaptation, harmony	Transmission of signals between organisms or parts of an organism; providing reproduction and perception; exchange of information and mutual adaptation

Thus, philosophy reveals the content of the phenomenon "communication" in the ideas of world famous philosophers such as Karl-Otto Apel, Jürgen Habermas, Dietrich Boler, Karl Theodor Jaspers, Herbert Marshall McLuhan, Vittorio Hösle, Martin Buber, Otto Friedrich Bollnow. They contributed to the emergence and expansion of the trend "communicative philosophy" for modern philosophy and the epistemology communicative approach. Thus, the philosophy scientific and conceptual vocabulary includes new scientific terms and concepts developed in the "classical" communicative philosophy. The development of communicative philosophy is also associated with the understanding of current processes by domestic scientists, application of the ideas of communicative philosophy, epistemology principles of the communicative approach to various areas of scientific knowledge. Engineering sciences define information as a basic category; and communication is studied as a subsidiary process that ensures the quality of information use.

The main tasks of technical sciences is to develop innovations that provide high-quality production, transportation, storage and use of information by scientific and technological progress.

Humanitarian sciences see the primary goal in the accuracy of content, in translation or in the description of historical events. The problem is defined as quality transmission of a subjective worldview understanding and transmission of the perception in the environment.

Natural sciences explore communication as a phenomenon of life support systems. The main function of communication is considered to be mutual adaptation of the system elements.

Social sciences study society as a system. They consider the ability to achieve a goal and get a result to be the basic criterion of utility of using communications. Thus, in terms of management and economy, the primary criterion of effectiveness is the achievement of objectives. The authors researching the modern management develop the concept of diagonal management, diagonal communications, under which management performs a compensatory function – as a complex coordinator of a common result of interaction of the management structure (state, enterprises governing body) and externally focused and controlled self-organized social and economic subsystems (companies or departments in the company). Thus, conceptually, the "diagonal" of the result is the main feature of the complex coordination of management capabilities and means, which maximizes the effect of self-

management and minimizes the external influence. The current approaches to managing communications have been developed within the marketing mix and designated as management of marketing communications. Let's consider the etymology of the term "communication" and its definition in the scientific literature [3; 4; 6; 10; 18 – 20; 22; 27; 44; 46; 52; 53; 56; 68; 83 – 85; 94; 97; 102; 115; 125; 138; 141; 145; 152; 153; 159; 160; 163; 165; 166; 177; 178; 185; 189; 218; 219; 225; 226; 246; 252; 256] (Table 9).

Table 9

The content analysis of the definition of communication

(developed by the author)

The aim and the result of communication	Identification
1	2
Connecting, informing, uniting	Communication, message / making common, uniting
Achieving the desired result or purpose	Process / the process of interconnected items
Accelerating the exchange of information	Process / the process accelerating the exchange of information
Transmission of information	Communication, information, transfer, form of communication
Social unity and identity of each element	Achieving social unity
Not provided	Networks
Not provided	Railways, communication lines / communication
Bringing the individual information to other people	Transmission of information
Not provided	The semantic aspect of social interaction
Transferring the content	Process / the purposeful process of transfer
Creating and sending messages	The process of creation and sending important messages
Setting up joint activities	Exchange of information between people
Interaction of people	Act of communication / function
Not provided	Different methods of messaging and connection
Combining	What unites, what is transmitted between partners
Ensuring collaboration	Exchange of information and content between two or more people

Table 9 (the end)

1	2
Exchange of information; identifying problems and finding solutions; the regulation of conflicting interests of interactions	Act of communication

The term "communication" (from the Latin *communicatio*) is translated as "exchange of information, message" [220; 257; 258]. In other sources there are references to the origin of the term "communication" from the Latin *communico*, which means "making general, combining" [220; 257; 258].

L. Barker defines communication as "the process of interconnected elements that work together to achieve the desired result or purpose" [262, p. 5]. Commenting on the above, the famous Ukrainian scientist G. Pocheptsov notes that L. Barker "lacks specificity in communication, because it is a very broad definition, which can embrace anything" [192; 193, p. 16]. G. Pocheptsov treats communication "as a process of accelerating the exchange of information". He believes that "all means of mass communication have grown on to accelerate the process of informing" [192; 193, p. 17].

The textbook on public administration under the editorship of V. Kozbanenko treats communication as "communication, transfer of information from human to human, a form of communication". Mass communication is "a process of messaging the information through technical means" – media or communication means (print media, radio, television, computer network) – to large audiences. A variety of mass communication is communication in state bodies which carry out the functions of government [37, p. 165].

In the author's opinion, a proper definition of the basic function of communication is given by V. Kondrashov in [83, p. 896] : "achieving social community while maintaining the individuality of each of its elements".

Therefore, it should be noted that in all the above definitions communication is seen as a dynamic process of exchange of information, and a feature characteristic of an organized system with established relationships. Most dictionaries treat communication as a "network of underground urban economy facilities (electricity, gas)" [51; 53; 219].

In the vast majority of old dictionaries the interpretation of communication as terrestrial communication systems is in the first place.

The explanatory dictionary of foreign words states the following: Communication (Lat.) – 1. railways, communication lines and so on; 2. communication, sharing information" [218; 220]. The Russian scientist Vladimir Dahl also put this meaning in the first place (but it is not justified by the time of research): "Communication (from lat. *communicatio*) – 1. communication, connecting one place to another; ways, roads; 2. communication, transmission of thought, communication means [219].

It should be emphasized that the second meaning refers to a permanent system of means of communication. One should also note that in the scientific literature communication is often identified with intercourse. The author believes that these concepts are synonymous, but not equivalent.

Any phenomenon from the perspective of a system approach has static, dynamic and qualitative aspects of the study. Thus, N. R. Nyzhnyk succinctly remarked that "the essence of a system in its statics is revealed through regular connections and relationships. The structure characterizes the system in terms of quality certainty, statics. The essence of the system in its dynamics is revealed through the analysis of functions of each element and understanding the operation and development trends in general" [168, c. 56]. Thus, communication as a systemic phenomenon has three aspects of study (Fig. 4), which is also confirmed by the analysis of the definition of this category [131; 138; 141; 142].

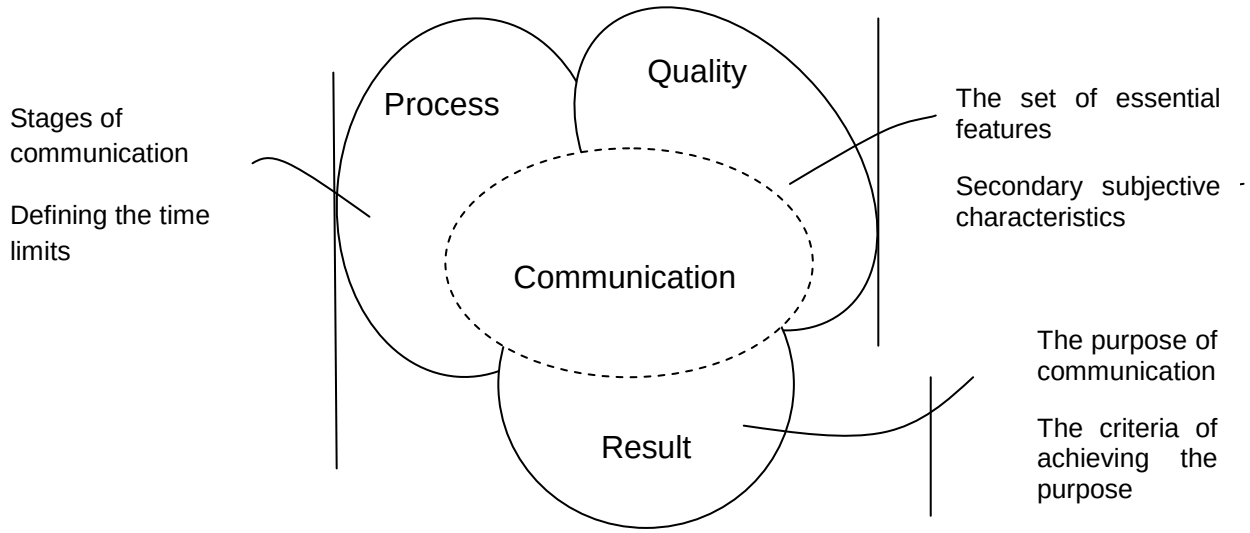

Fig. 4. **The aspects of research on communication**
(developed by the author)

Researchers compare communication with the process of intercourse, sharing, collaboration, transmission, distribution and association. As a result, communication is identified with dialogue, exchange, encounter, interaction and mutual understanding [113; 138; 143; 147; 192; 228; 272; 410] (Table 10).

Table 10

The triune consideration of the category of communication

(developed by the author)

Communication as	Identification	Function
a process	The combination of interaction, transmission, achieving commonality, sharing, communication	Specifying succession of events in some time period, providing for certain factors
a result	Messages, communications, communication, network, system interfaces, exchange, meeting	Defining objectives to be achieved; receipt of a certain state that provides certain criteria for achieving the results
a quality	Dynamism, social information value, completeness, symbolism, subjectivity, reflexivity	Characterizing special features of communication as a concept and category

The semantic analysis of related categories (communication, sharing, meeting, etc.), with which the researchers equate communication, makes it possible to offer the logic of their development and relationships and determine the place of the category of communication (Table 11).

Table 11

The semantic comparison and the logic of connection of the related synonymous categories

(developed by the author based on [83; 206; 207; 218; 219; 245; 246])

Monologue, effect →	Communication, intercourse, dialog →	Harmony
1	2	3
Greek *monos* – "one" and *logos* – "word"	Latin *communicatio* – "connection, message"; Old Slovenic *опчитися* – "to share; to make a member";	Greek *harmonia* – "communication, harmony, proportionality"

Table 11 (the end)

1	2	3
	[Greek *dia* – "two" and *logos* – "word"]	
One-way **transmission**	Feedback, i.e. **exchange**	**Achievements** due to a community
Address of the subject to others or to himself	Informative and existential subject – subject interaction which resulted from understanding	Deep ordering, balanced integrity, consistency mutual correspondence
Speaker base, concrete processes of interaction	Unity, difference	Formation, balanced integrity
The early stage of interaction	Consecutive, phase, monologue	High result of the interaction, which is due to subjective activity
Provides interaction process orientation, filling it with subjective content	Shape, cooperation, items	An output pattern being essential inner relationship of alternative principles, the final form of development

So, if the term "communication" emphasizes the procedural nature of data sharing, the unity of bilateral flows, communication is usually understood as a special type of intercourse in which the basic process is accompanied by an emotional and existential component. K. Jaspers describes existential communication as follows: "In a communication of this kind I first meet and learn myself, another person is really another person: the person's uniqueness is crucial for substantiality of their very existence. Existential communication cannot prepare any "before" or "after" it exists here and now. It is in this process that individuals create each other. The relationship of these two autonomous individuals within a certain event and related communication enables each of them to understand their own life" [261].

Existential anthropology describes such characteristics of a human being as a "meeting", "awakening", "confidence", "holiday", "event". The idea of Karl Jaspers was clarified by Otto F. Bollnow [267] through the category of meeting in his eponymous essay: "Meeting is a testimony about a person's encounter with an unpredictable in itself reality that is fateful for it and differs from what the person expected, makes him navigate in the world in a new way" [267]. This means that the subject-subject relationship changes a human's life through the discovery of new fundamental opportunities, self-actualization that happens through communication.

Note that in organizational management, communications occur at the level of relations between government and society, and at the level of interpersonal communication.

Understanding communication as existential communication and dialogue is demonstrated by communicative and modern philosophy, studied by K. Apel, J. Habermas, V. Hosle, etc. On this basis, a methodological turn in the philosophy of postmodern era from "the classic paradigm of the philosophy of consciousness to the post-classical philosophy paradigm of communication" takes place [52, p. 9].

Beginning with Martin Buber, Edmund Husserl and Charles Theodor Jaspers, the mandatory presence in philosophy of the "other" as "you" as a significant factor in the deployment of the human world inevitably leads communicative philosophy to moral and ethical issues and problems of values as a meaningful core that makes possible mutual understanding, including speech. The "other" is the subject of communication, which is of equal, and no less value than "I", which is thus constituted not within the subject-object relationship, but on a much wider subject-subject ground. Communication itself in this context reveals itself in all its dimensions as an exchange of not only signs but meanings and values and even energy.

In the literal translation from Latin, *communicare* means "counsel" or in the aphoristic formulation of F. Kaufman, this is "the primacy" of a contact instead of a contract": first the communicative doctrine originated as opposed to the theory of the social contract, "because a contract is a relationship based on the commonality of people while communication, by the definition of its leading theorists (Karl Jaspers, O. Bollnow, K. Apel, J. Habermas), is finding himself, reflecting himself in "the other" (which does not necessarily refer to the other person, but to another communicative reality).

According to L. Menzhulina, "we can understand only what seems to us an answer to the question that is already living inside us. Understanding is not determined by penetration into another consciousness – it is impossible because of the historical dynamics of consciousness, but the degree of existential understanding of the importance of the subject for the interpreter, how far this understanding enhances the possibility of his real authentic existence. That is why a person tries to understand only that object, that being, whose knowledge is also self-knowledge. The interest of a person in the world is a reflection or manifestation of the hidden meanings of his own existence [110, p. 56, 63]. Thus, communication is a process of display of the contents of the initiator of communication, mapping his needs and interests, i.e. nature and activity.

Chapter 3
Communication activity as a type of economic activity and its functions

The concept of communication activities is complex and determined by other categories. Let's consider the relationship between the categories and concepts based on the definitions of the term "communication activities" given by various authors [3; 4; 6; 18 – 20; 27; 44; 52; 56; 68; 83 – 85; 94; 97; 102; 115; 138; 141; 145; 152; 153; 159; 163; 165; 166; 177; 178; 185; 189; 226; 252; 256] (Table 12).

Table 12

Generalization of the meaning of communication activities

Definition	Identification / feature
1	2
The kind of economic activity which consists in the production and perception of new properties and provides specific categorization of spiritual change between the activity and reverse transferring of the spiritual content of consciousness	Type of activity, the production and perception of new properties
Information on the impact of internal and external environment of the enterprise in order to create demand and promote sales	Media impact
A complex multichannel system of human interaction	The system of human interaction
An advanced multi-faceted process of establishment and development of contacts between people (interpersonal communication) and groups (intergroup communication) generated by the needs of the common minimum which includes three different processes: communication (information exchange), interaction (exchange of operations) and social perception (perception and understanding of a partner)	The process of establishment and development of contacts
The activity of social institutions, where the most important goal is the formation of public opinion and public sentiment, social-psychological atmosphere and other states of conscious society	Social institutions' activities
Tool support and use of social memory that accumulates the cultural and historical experiences of social actors	Tool support and use of social memory

Table 12 (continuation)

1	2
Communication between people in the process of joint activity – exchange of information, thoughts, feelings and ideas	Communication of people
A complex multichannel system of human interaction, part of which is communicative, interactive (organization of communication), perceptual (understanding)	A talk. The complex multichannel system of human interaction
The activity, which is the subject of communication with another person – a partner in communication revealing the psychology of communication. The communication need is the desire of man for the knowledge and assessment of other people and through them, and with their help – self-knowledge and self-esteem, which leads to knowing oneself that becomes the object of knowledge and relationships with other participants in communication	The activity, which is the subject of communication
The category of idealist philosophy, which means communication by which the "Self" finds itself in another one	Communication
The concept does not only describe the action message that "transports" information, but also a very poetic auto operation, combining three different parts, namely information, communication, understanding, which may be included in subsequent communication	Action message of poetic auto operation
The purposeful interaction of all participants in communication, learning and development, which is reflected in the transition of the communication objective practical experience in the subjective experience of communication	Purposeful interaction
Information on the impact of internal and external environment of the enterprise in order to create and stimulate demand for their products	Media impact
Activities aiming to transfer information from the source to the receiver via a channel	Transmission of information
An advanced multi-faceted process of establishment and development of contacts between people and their group needs generated by joint activities	The process of establishment and development of contacts
Informative interaction of people who communicate	Informative interaction
Social communication due to the transfer of information and perceptions in terms of interpersonal and mass communication through different channels using different communication tools	The process of transferring and perception of information

Table 12 (the end)

1	2
The joint activity of participants in communication (communicators), during which a general (up to a certain limit) view of things and actions with them is developed	Joint activities
Transfer of content in the social space. The subjects who entered in communication, have three objectives: firstly, the recipient wishes to receive content from some attractive communicant; secondly, the recipient wants to communicate some content to other participants to affect their behavior; thirdly, both the communicants and the recipient are interested in cooperation to share some content	Transfer of content
The activity, which is the subject of another person – a partner in communication. The concept of communication activities can reveal the psychological nature of communication. Communicative need is the desire of man for knowledge and assessment of other people and through them, and with their help – for self-knowledge and self-esteem. People learn about themselves and the environment through a variety of activities, because the peculiar nature of people is manifested in each of them. But communication activity plays a special role in this regard, because it is aimed directly at the other person as to its subject, and being a two-way process (interaction) leads to knowing oneself which becomes an object of knowledge and relationships with other participants or other communication	A two-way process of interaction that is the desire of man for knowledge and assessment of other people and through them, and with their help – for self-knowledge and self-esteem
A complex multichannel system of human interaction. The main components of communicative processes are [3]: • communication, providing information transfer; • the interactive element, which contributes to the regulation of interaction of partners in the communication process; • the perceptive component responsible for organizing mutual perception, understanding, and reflection of communication assessment	A system of human interaction

The concept of communication activities includes two categories – communication and activities. The category of activity is more focused on production, consumption, cognition and so on. In turn, the category of communication combines the concepts of a communication process, a communication structure, a communication system and so on.

Combining the two categories of communication and activity makes it possible to unite the content of these two notions (Fig. 5).

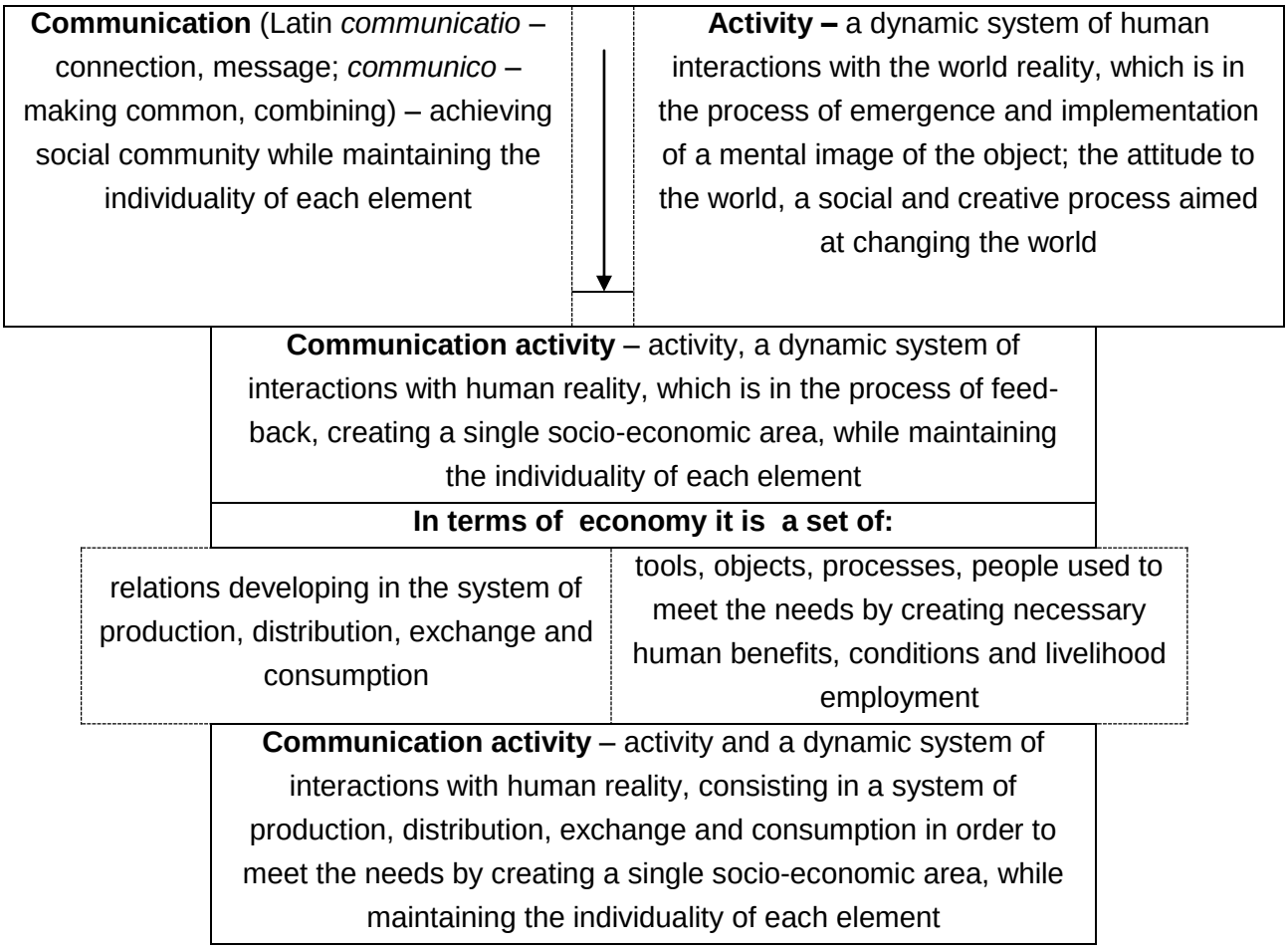

Fig. 5. **Formation of the category "communication activities"**

To sum up, the category in this case is an activity that, in turn, manifests itself through the category of system.

Any system assumes the existence of certain elements, which are linked to certain bonds. The dynamic aspect of the study of communication involves the use of a process approach to the study of the category of communication activities. The communication process works as an active process of scientific teaching, aiming to optimize the exchange of information, namely the transfer of the content without any deviations.

Communication as one of the common and extensively used terms is the most abstract of a number of related ones. It is therefore necessary to offer a criterion that the author chooses for key information in the separation process of the communication process.

The communication process in the economy as a set of specific stages, includes the steps of forming dynamic change, transmission, reception, decoding and use of information in both directions by the interaction of communicants.

Different approaches to the consideration of communication cause a large variety of models of the communication process. Among them are: linear models of Harold Lasswell (1948) [280]; the Shannon – Weaver mathematical model (1949) [299]; Berlo's SMCR model (1960) [266]; Wilbur Schramm's interactive model (1954) [298]; nonlinear geometric three-dimensional models of T. Newcomb; Friedemann Schulz von Thun, Westley and MacLean's conceptual model (1957); Sam Becker's mosaic model (1968); Frank Dance's helical spiral (1967) [274]; circular patterns of G. Maletzke (Maletzke's model of the mass communication process) [422]; two-step models formulated by Paul F. Lazarsfeld, Bernard Berelson and Hazel Gaudet (1940) [281] and later supplemented by Elihu A. Katz (1955) [297]; multidimensional models of Ruesch and Bateson (the functional model, 1951); Dean Barnlund's transactional model (1970) [263; 264]; the suggestions for communication models [263; 264]; the systemic model of communication (1972); Brown's holographic model (1987); the fractal model of communication.

All the researchers used a common analytical approach: to understand the mechanism of the act of communication, they divided it into component parts and analyzed each component separately. The synthesis of approaches to modeling the communication process is given in Table 13.

Table 13

The elements of the communication process (foreign authors) (developed by the author)

	Source. Sender	Transmitter	Message	Goal of messaging. Reason for interaction	Channel. Medium. Form of communication	Coding	Decoding	Signal	Noise	Image	Effect	Experience, culture	Leader	Feedback	Recipient
Classic model															
Aristotle [7, 8]	+		+												+
Linear models															
H. Lasswell [280]	+		+		+						+	+			+
D. Berlo SMCR	+		+		+										+
C. Shannon, W. Weaver [299]	+	+	+		+			+	+						+
W. Schramm [298]	+		+		+	+	+							+	+
Nonlinear models															
T. Newcomb	+			+											+
F. Schultz von Thun	+		+												+
S. Becker	+		+		+										+
P. Watzlawick [433]	+														+
B. Westley, M. McLean	+											+		+	+
G. Maletzke [422]	+		+		+					+				+	+
P. Lazarsfeld [281]	+		+										+		+
D. Barnlund [263; 264]	+		+		+	+	+								+

Aristotle distinguished three components of communication: the language (Logos), the speaker (Ethos) and the audience (Pathos). This classic triad (communicator – message – communicant) is used in all models of communication. The most simple model, convenient for initial analysis, is also the linear model of communication SMCR of David Berlo (1960): source – message – channel – recipient. It is also called the Stanford model of communication. According to it, each item has its own characteristics: for the source and recipient they are communication skills, attitudes, knowledge, characteristics of the social system and culture; for the message they are content, items, processing, structure and coding; the channel can be visual, auditory, tactile, gustatory, olfactory. D. Berlo puts the source and the recipient of a message into the social and cultural environment that affects the content of messages through feedback; he also identifies five possible channels of communication.

The model of Claude Shannon and Warren Weaver was designed in 1948 – 1949 by studying the efficiency of propagation of radio signals and telephone cables. The model includes the information source, the message, the transmitter, the signal, the channel, the noise, the receiver, the information destination. The authors claimed three levels of analysis of the communication process: technical, messaging semantics, understanding the effectiveness of the message recipient.

Professor Wilbur Schramm identified communication with an act of establishing contact between the sender and the receiver via a message. In one of his models (1954), he introduced the interpreter and the feedback, making the model self-regulatory. The main elements of the models are: a source, an encoder, a message, a channel, a decoder, a receiver. When required, the recipient of information may, on his own initiative, send a message, thus turning from a passive participant in the information model into an active participant in communication. In this situation, the unilateral action passes to interaction and feedback is formed.

One of the most famous linear models of communication is H. Lasswell's model which highlighted five important components of the communication process: Who says? – Informing? – To whom? – What channel? – With what effect?

Linear models through simplification facilitate understanding of step-by-step events. But in most cases they do not reflect the real state of the system. In practice, there is often not just a consistent exchange of information, but more complex processes take place that attract to their structure not only people, but also their thoughts, feelings, attitudes, social experience, emotional and mental state, etc.

The nonlinear geometric model of communication of T. Newcomb (1953) was represented as a triangle in terms of social psychology. The model takes the form of an equilateral triangle whose vertices are: the communicator – A (the sender), the recipient – B (the receiver) – the cause of interaction – X (the matter of concern). In the translated publications the element X is called a social situation, this model is also known as the ABX model. T. Newcomb claimed that the focus of A, B and X elements depends on each other, he pointed out four orientations (A to X; A to B; B to X; B to A).

The four sides of the message model after F. Schulz von Thun are: the subject content (the messages I send), the attitude (you-message, my attitude to you, what I think about you), the appeal (what I want to achieve by sending this message), self-expression (I-message, what I want to say about myself).

The mosaic communication model of S. Becker (1968) (recipient – message – messenger – communication channel) implies that each of us exists in a complex communications environment – mosaic. This mosaic consists of a huge number of fragments, bits which are located in space and time. Everyone should understand what bits are its needs and how they group together to form a specific message to go to its holistic worldview.

Another model of bulk communication is represented by the helical spiral model developed by Frank Dance. This model defines communication as a dynamic process which is the subject of an individual personality development from birth to present. It is not confined to a communication cycle, communication moving forward, repeating the passed stages of development at a new level.

The volume "toothed" model, developed by Paul Watzlawick, Janet Beavin, and Don Jackson (1967), which includes the beginning of communication (beginning of a communication event), the communicants

(person 1 and person 2) and the end of communication (the end of the communication event), stresses that the dynamic evolutionary nature of the communication process is much more determining than the components and the purpose of the communication process.

The model of B. Westley and M. McLean (1957) states that communication starts from the moment when a person selectively responds to his environment or sensitive experience. Underlining the value of feedback and exchange of information with external social environment makes it circular.

In circular communication, as opposed to the linear one, people simultaneously and continuously act as a source and a recipient of the information. Here, the linear model is transformed into a continuous process of communication. The first circular communication model was presented by the German communicavist G. Maletzke who based it on traditional basic elements: the communicant, the message, the means of communication (the medium) and the recipient, but also added components between the means and the receiver, namely the impact of communication means on the recipient's image. In traditional communication components (the communicator, the message recipient, the medium) the medium is treated by him as both the channels of communication and the information media. G. Maletzke introduces the concept of the communicant's image and the recipient's image. As to the feedback, he studied the pressure of the content of the message and the medium on the communicant, and the medium's pressure on the receiver.

The idea of a two-step model was grounded in 1940 during the election campaign in Ohio (USA). It was later advanced by the sociologists P. Lazarsfeld, B. Berelson, H. Gaudet, E. Katz who suggested that the message sent to the audience is first received by the most authoritative members of the group. In the next step, the leaders begin spreading the information among their supporters.

Messages in the system of mass communications tend to follow the audience, that is the audience is given the information it needs and can understand. Otherwise it will not be included in the system of communications. So the audience shows its homogeneity (uniformity) and the initial information interacts with the whole mass of people and each person separately. The

uniformity of people as members is realized through the mass behavior. People having become members of the mass begin to behave independently of the roles preconditioned by their social status in the routine life. The audience of mass communication is a sufficiently specific formation that does not match the social groups of human communities which consistently reproduce themselves within a particular social structure.

Barnlund's idea that the communicator and the recipient are interested in both receiving the message, and sending it is represented in the model which consists of the following elements: communication (considered as a communication channel); a separately singled out act of transferring information from one interlocutor to another, this information being separate from the message (a concrete communication session called a speech act); the personal filter of the sender and the personal filters of the recipient which may vary depending on the culture or gender; interference ("noise"); the encoding and decoding processes, whose effectiveness is conditioned by the same encryption system. Increasing the elements of the communication process, on the one hand, complicates the analysis, on the other hand, makes the analysis more detailed and justified. The practice of mass communication has also shown that in the development of communication models it makes sense to introduce such significant components as obstacles, barriers of communication.

Accordingly, the model of the communication process, developed by Yuriy Vorontsov is of significant interest. Yu. Vorontsov identifies the following components: the source of information, the communicator, the message, the recipient, the communication channel, the extra-setting message, the source of the mechanical interference, the source of semantic obstacles, class and social filters, individual filters, semantic fields, the fields of the communication environment, information loss, the feedback "recipient – communicator", the feedback "recipient – source of information".

The model of Vorontsov encourages researchers to study communication as a system of conditions and factors rather than after the type "communicator – recipient". This approach to the analysis of communication greatly enhances understanding of the process and makes it more manageable, and therefore more effective.

The systematic study of the communication process simulates modelling possible development scenarios, understanding the causes of the

processes. In economic terms, the interest in the communication process is primarily related to the effect of communication. The ability to evaluate the effectiveness of the communication process makes it possible to consider the communication process both as a result of communication and as an element of the industrial economic system.

The basis of communication activities, as rightly pointed by Aristotle is the word (a message or information). However, who exactly spreads information, what for and how information is spread are the key questions of modern communication.

The author believes that the communication process should be studied from the perspective of the motivational activity approach. Then the communication process should be logically researched in terms of orientation to needs with meeting these needs being the priority of communication (Fig. 6).

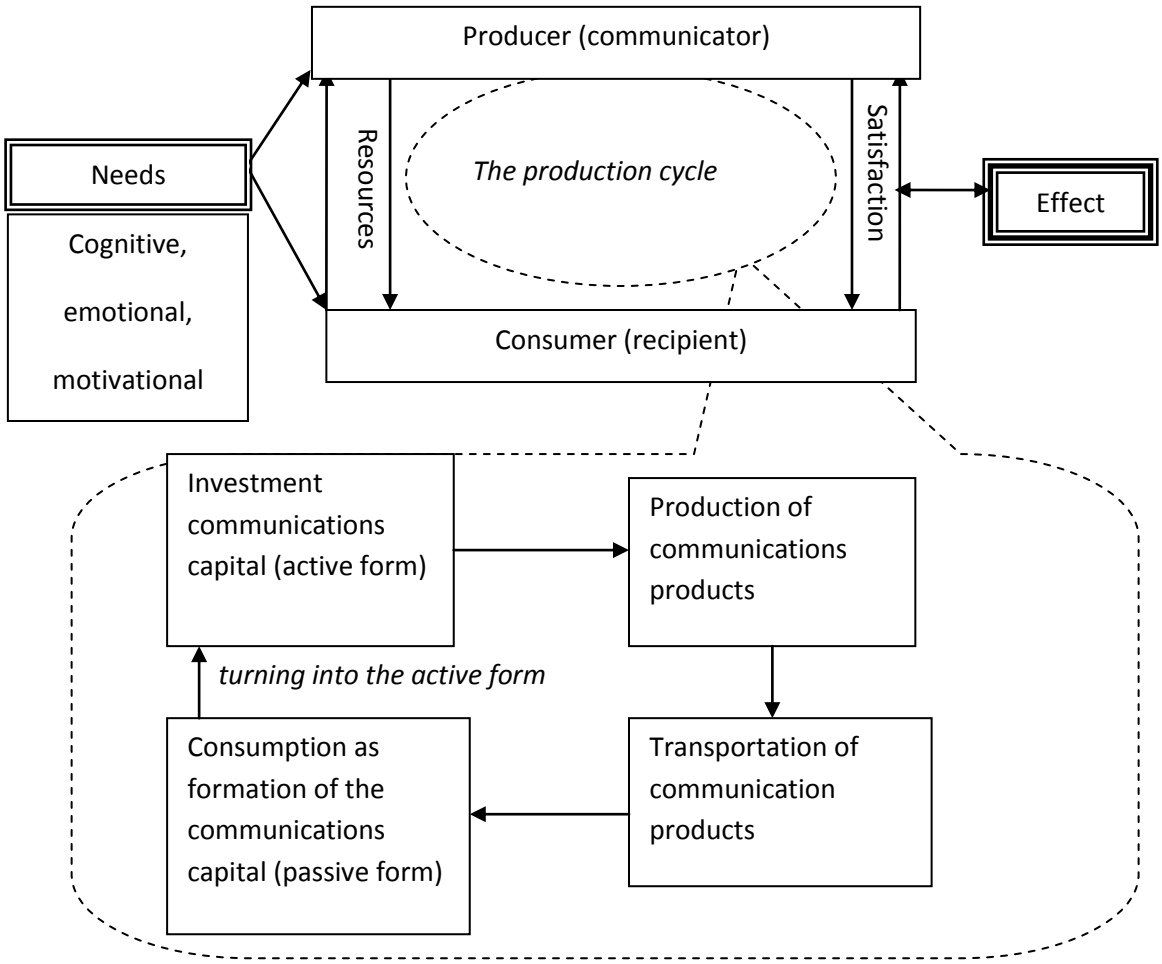

Fig. 6. **The diagram of the communication model (in terms of the production cycle)** (developed by the author)

In turn, the diagnosis of the qualitative and quantitative characteristics of the communication process should be based on the following elements: needs; producer (communicator, sender); consumer (recipient, receiver); communication product (messages, information, experiences); communication capital; communication channel; effect (result, satisfaction of needs).

Meeting the needs in the economy is realized through the consumption of certain products. Communication needs are met through communication products: communication goods and services. The concept of a communication product in literature is not defined. The category of a communication product is not used in legislation, but there is the term "communication services". It is used in the Law of Ukraine "On the Basic Principles of Information Society in Ukraine in 2007 – 2015" [385]. According to this law "the private sector of the economy ... provides information and communication services" and the "association of citizens interacts with the government, local authorities and the private sector in terms of a fair and equal access to information and communication services, shapes public opinion on the priorities and perspectives of development of information society".

But the law in Ukraine does not provide a detailed description of what communication services are, there is no definition of the term. Along with the term "communication services", the text of the laws contains such synonymous terms as "a telecommunication service", "an e-service". The term "a telecommunication service" is defined by the Law of Ukraine "On Telecommunications": "a telecommunication service as a product of activity of the operator and/or provider of telecommunications, aiming to meet the needs of consumers in the telecommunications sector" [202]. In turn, telecommunication is defined as "transmission, sending and/or reception of signs, signals, written text, images and sounds or messages of any kind on the radio, wire, optical or other electromagnetic systems".

The communication product is a basic element of economic processes in the market of communications. Thus, the author believes that it is necessary to outline the main elements of the concept of communication product (Table 14). From the standpoint of the content and structural analysis of the concept, the following elements should be selected for its definition: identification, special features, functions and the result to which the phenomenon defined is oriented.

Table 14

The structure of the concept "a communication product"

(developed by the author based on: [122; 127; 138; 140; 152; 202])

Element	Definition
Identification	the type of product as a subject, as a result of human labor; the product type of communication; the result of human activity in the area of communications; the result of communication
Special feature	communication that is associated with quality; characteristics of the notion of communication, namely: social, informational, dynamic, meaningful, symbolic, subjective, reflective
Function	communication processes, the combination of interaction, transmission, achieving community exchange
Result	Fact message, communication, transfer, exchange, meetings, networking, system interfaces

Thus, using the structural characteristics listed above one can attribute the products of economic activity to a class of communication products. A specific feature of a communication product is its complexity and inseparability of communication goods from communication services. Communication goods without appropriate communication services have no value and, consequently, their price in the market is unprofitable. Also the quality of the communication product directly affects the quality of communications services (the phone that does not work is unable to realize its function, i.e. join the mobile networks, but if the network coverage is unavailable, the mobile phone will not work either).

Thus, the author believes that the complex nature of the material and immaterial communication products is worth noting (Fig. 7)

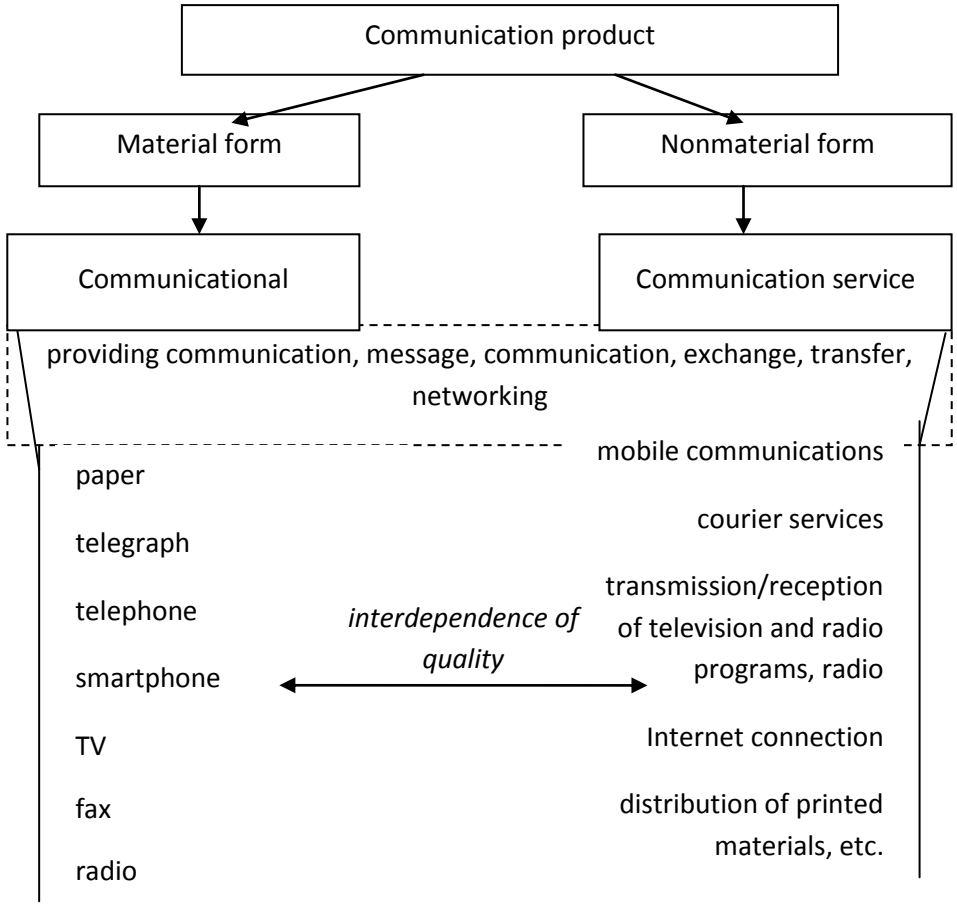

Fig. 7. **The structure of the communication product**
(developed by the author)

The list of products belonging to the category of the communication product must be specified using the defining characteristics of the category "communication". The legislation in Ukraine does not provide a general and universal classification of goods and services; it only defines the goods nomenclature for foreign economic activity. This list includes products that are related to ensuring the effectiveness of the communication process. Thus, the following items are singled out: "electrical machinery and equipment and parts thereof; apparatus for recording or reproduction of sound, equipment for television recording and reproduction of sound and images, parts and accessories"; "transport vehicles, equipment and devices related to transportation"; "optical, photographic, cinematographic, monitoring, measuring, precision; medical or surgical devices and apparatus; parts and accessories thereof" [331, p. 85, 86–90].

In the transition to a market economy and strengthening social and economic instability, the responsibility of managers for the results of economic activity, the efficiency of using the category "capital" increases. The mechanisms of formation and the efficient use of capital, the laws of the origin and distribution of social wealth have always interested representatives of economic thought of different times. Therefore, the question of the essence of the category "capital" has always belonged to the most acute and complex ones [127]. In the scientific literature, capital is regarded by the authors as: 1) the factor of production; 2) the movement of advanced value; 3) the resource of revenue; 4) the equivalent of value.

Capital (from the Latin *capitalis*) – main, the main property, the amount of) is a set of assets used for getting profits in the future. The main problem of the capital theory is the study of changing patterns of surplus value. The turning point in the development of economic thought was the work by Karl Marx "Capital, Critique of Political Economy" [108].

The basic idea of Karl Marx – commodity circulation is the starting point of capital" [108] – inspired researchers to look for new sources of capital creation – its new factors. The classic list of factors of production (land, labor, capital) has extended by the categories of business, information, competence, social bonds, brand.

Understanding capital in terms of the doctrine of Marx as movement of value ("... the value originally advanced is not only kept in circulation, but also changes its value, adds surplus value or increases. And this movement transforms it to capital ... " [108]) requires clarification of the conceptual system of the category "capital". That is capital as movement of cost in the end turns into money, which, by definition of K. Marks, "is its end product. This end product of commodity circulation is the first form of manifestation of capital". The purpose of the movement of advance funds on the stages "... commodity – money – goods ..." is meeting needs. In its turn, the need may be the movement itself – capital for the sake of capital.

The process of consumption in the economy is predetermined by needs whose satisfaction provides an individual with the necessary quality of life. Work as a purposeful, conscious activity aimed at meeting the needs of the individual and society, serves the process, providing the manifestation of

capital. However, besides work, psychology highlights other activities: playing, learning, communication [3; 18; 19; 27; 51; 98; 166]. V. P. Andrushchenko and N. I. Mikhalchenko also believe that the phenomena of activities and communication mutually condition qualitative features of each other. Communication of people is always active, and vice versa – human activity is only possible on the basis of communication. Irrespective of circumstances and forms of human activity, no matter what structure it takes, it cannot be regarded as displaced of public relations of social life [4, p. 96]

Therefore it would be reasonable to assume that the formation of the additional cost may result from other activities – games, communication and training. Thus, the author offers a new integrated approach to the classification of capital – depending on the type of activity – as a way of building additional cost with regard to its form of manifestation. The correlation of the major categories, providing the manifestation of capital in today's information society and received on the basis of the aforementioned approach is shown in Fig. 8 (developed by the author).

For the modern classification of capital it is necessary to consider tangible and intangible forms of the elements of the process. Such a division is of particular importance in terms of information society and knowledge economy. Thus, the advance cost movement can act both as a carrier of only physical characteristics, i.e. labor, and socio-psychological ones, i.e. staff, human, capital.

The existing classifications of capital offer many kinds of it in theory and practice, so one should pay attention to potential unlimited varieties of capital embodiment. Thus, the author believes that the elements of the column "the object of activity" as items of capital manifestation, such as information, communication, emotion, etc., give rise to new types of capital, respectively, – information, communication, emotional, etc.

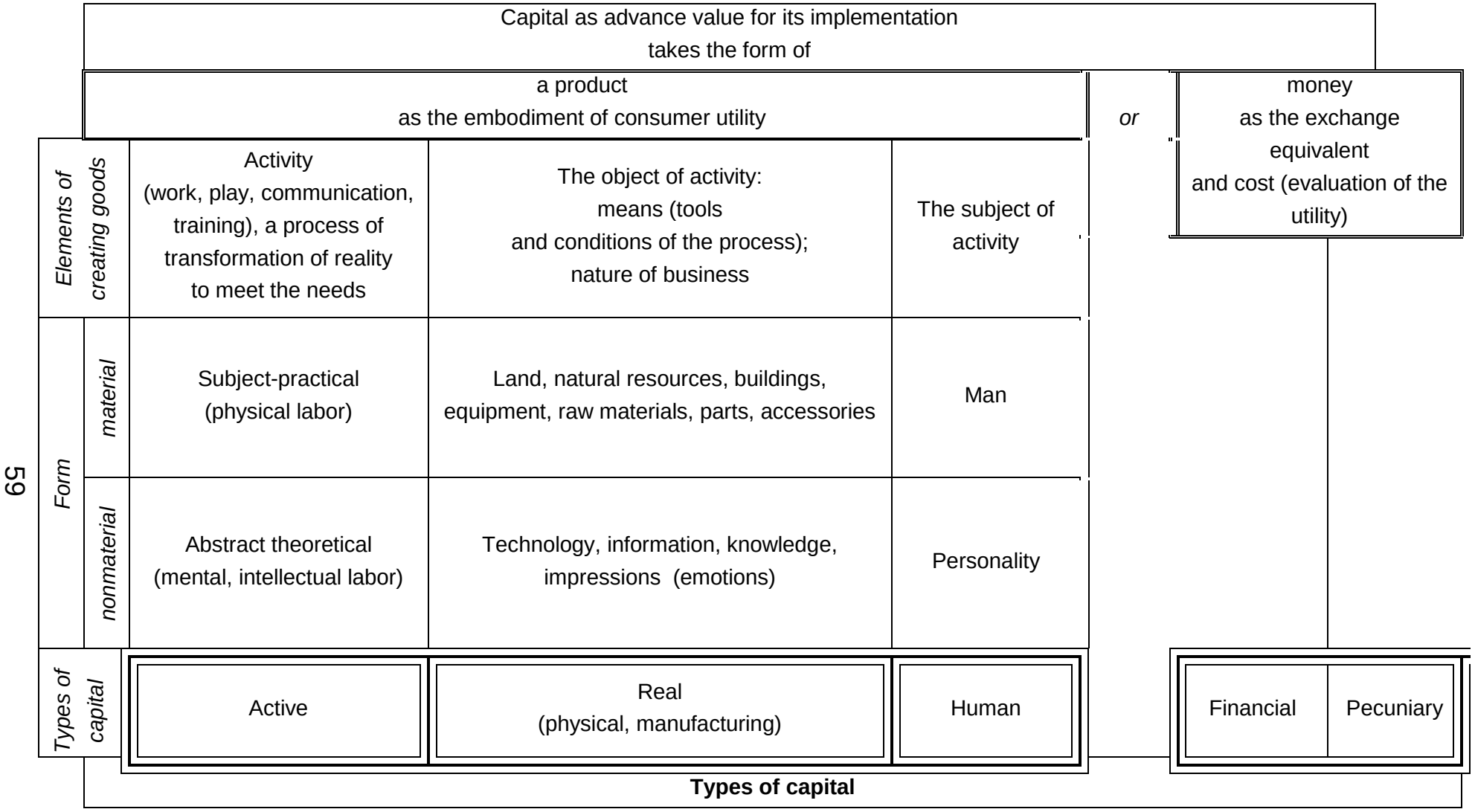

Fig. 8. **The major categories of value providing modern manifestation of capital in information society** (developed by the author)

According to Nando Malmelin, the category "communication capital" consists of four components: legal, organizational, human and relationship capital. But the classification given in Fig. 8 makes it clear that it is impossible to identify the components listed above. Thus, the definition of the concept "communication capital" should be based on an economic approach. Taking into account the fact that the economic practice fixes the types of capital in legislation and official documents of international organizations, the author offers a legislative definition of the concept "communication capital" as the advance value of communication (communication products) that brings income as a result of communication activities.

The current level of government regulation of economies makes it possible to introduce new technologies (information, communication, management) in practice, which improves the quality and speed of decision making and effective monitoring of implementation of decisions, ensure the stability and optimization of the processes of state regulation The idea that widespread use of socio-economic communication in management, the expansion and enhancement of the role of information technology, computer networks, telecommunications will grow in the future is supported by different authors [1; 12; 14; 21; 33; 34; 37; 38; 43; 60; 62; 63; 70]. Accordingly, the value of these factors in the optimization of the state regulation of the economy, particularly in terms of the development of communication activities, will also grow.

Chapter 4
The idea of a common information space as a condition of economic and information security

Each state, depending on its national and historical traditions, geographical and geopolitical conditions and labor skills of the population creates its own set of industries. Ukraine's economy also has a special integrated complex of interdependent industries.

Ukrainian economy development through processes of cooperation, integration and specialization of activities leads to the formation of stable relations between sectors, creates mixed production and interindustry complexes, which in turn cause the formation of new industries and types of production.

Definitely true is the conclusion that in the transition to a market economy of Ukraine the sectoral principle of its vertical organization should cease to exist in the near future because market makes it difficult to identify an enterprise with a particular industry. Analysis of regulations and publications has shown that a global industrial restructuring has started [14; 17; 59; 60; 70; 71; 89].

The Commercial Code of Ukraine (Art. 260) [36] and statistical classifications define the term "industry" as a set of all production units which are engaged in principally the same or similar economic activities. The Ministry of Economic Development and Trade of Ukraine [349] separately positioned ten categories in the section "Basic economy branches of Ukraine": chemicals and pharmaceuticals; mechanical engineering; woodworking and pulp and paper industry; light industry; mining and metals; energy; agriculture; transport, communications, information; tourism; science. The magazine "Focus" in April 2009 made a forecast of industries in Ukraine, namely six of them: metallurgy, chemicals, real estate, finance, food and processing industry, mechanical engineering [394; 400].

According to the General Classifier, in 1995 [331], Ukraine had nine branches with relevant codes: industry (10 000), agriculture (20 000), forestry (30 000), fishery (40 000), transport and communication (50 000), construction (60 000), trade and catering (70 000), logistics and marketing (80 000), utilities (90 000). The latest version of NACE codes (NACE 2010) [331] identifies 17 sectors: A – agriculture, hunting, forestry; B – fishing, fish farming; C – mining industry; D – processing industry; E – electricity, gas and water; F – construction; G – trade, repair of motor vehicles, household appliances and personal use items; H – hotels and restaurants; I – transport and communication; J – financial activities; K – real estate, renting and business activities; L – public administration; M – education; N – health care and social assistance; O – communal and individual services, activity in culture and sport; P – activities of household; Q – activities of extraterritorial organizations.

The author also agrees with the idea that "a lot of enterprises of various ownership striving for operation flexibility and sometimes survival are objectively functional, i.e. are engaged in mixed activity" [331].

According to N. D. Kondratiev, the modern economy is characterized by "flexibility" which is a key feature for determining the laws of the national economy. He studied building a society and the main categories of social phenomena in his book [82] in which be concluded that "the tendency of the psychophysical nature of man to variability is one of the deepest terms of variability and plasticity of the society … Society is to some extent not only real, but totality organized. Thus, plasticity of the structural component of the national economy is determined by the ontological essence of a human activity spirit".

The need for separation of priority sectors or activities for development and as a result, changes in the structure of the national economy was characterized by Francois Perroux in his concept of a harmonized economic growth. The doctrine of "growth poles" and the dominant units was described by F. Perroux in the work "Economy of the Twentieth Century" [292]. Its main idea is that macroeconomic growth policy must achieve a better allocation of resources and income and, based on the effect of dominance, harmonize the existing sectoral, territorial and social structure. His idea that structural policy is inevitably selective, aimed at the "growth poles", i.e. complex economic units (sectors or territorial centers), provided that out of a number of activities those ones are chosen as leaders that grow faster than the economy in general and are most conducive to research and massive innovation in the future. A vanguard industry (activity) unit also causes a synergistic effect of agglomeration, combining interdependent economic activities that receive additional benefit from the fact of being in one place.

The author has to justify the need for selecting communications as a sector of the economy and determining a complex communication system as an integral unit of the national economy.

The system (from the Greek *systema* – composed of parts, connected) is a set of interrelated and connected elements forming a certain integrity, unity [51; 223; 257].

In the philosophical dictionary [246] a system is a category that means a facility, organized as integrity, where the energy of links between the elements of the system exceeds the energy of their connections with the elements of other systems which determines the ontological core of the system approach. The forms of objectification of this category in different ways and through different approaches used the established theoretical and

methodological concepts and tools. Describing the system as a whole scientists traditionally speak of the unity and integrity of interrelated elements. The semantic field of the concept "system" includes the terms "communication", "element", "whole", "unity" and "structure", i.e. circuit connections between the elements.

In turn, in management the control system is a set of all elements, subsystems and communication between them and the processes that ensure the functioning of the organization [68; 112; 169; 175; 176].

Modern treatment of the systematic paradigm of the economic theory as the basis of building a unified theory of the strategic process is presented in the ideas of J. Kornai [87].

The main difference between the "new systemic" version and the classic systems approach which is most developed in the publications of classic scholars L. von Bertalanffy, M. Mesarovic, is in the transition from endogenous to exogenous treatment of the system that combines descriptive and normative approaches [53]. In the new formulation the system does not mean a lot of elements interconnected in some way (the endogenous definition) rather it is seen as an integral part of the world, relatively stable in the space and time, which is singled out by the observer based on spatial or functional characteristics (the exogenous definition). Organizations, markets, industries, countries and other economic facilities naturally belong to economic systems. However, the composition of socio-economic systems is immeasurably wider because institutions and institutional knowledge, processes, and projects can be classified as systems.

Thus, the "new systemic" version is associated with the rejection of set-theoretic foundations of the concept "system" and the recognition of the system as a partial image of reality in the individual or social consciousness ("the Gestalt system"). It is this understanding of the system that can be reconstructed, in particular based on the works of the founder of the new systemacity J. Kornai [87]. The system paradigm, representing the economy as a set of interacting transformed systems which evolve, acts, thus, on the one hand, as an alternative to the paradigm of neoclassical economics with its distribution into macro- and microeconomics, on the other hand – as a concept that integrates the neoclassical, institutional and evolutionary approaches.

The fundamental systemic approach to the study of this type of economy, according to G. Kleiner [75; 76] "could be called natural economy, similar to the natural philosophy (the first historical form of philosophy, speculative interpretation of nature, considered in its unity)". He identifies its basic principles (similar to the principles of natural philosophy) Table 15.

Table 15

The principles of the natural economy

(summarized by the author [according to 75; 76])

Principle	Meaning
Holism	The unity of the social and economic macro- and microcosm, the harmony of nature, society and the human
Universalism	The picture of the socio-economic space as a universe which is subject to universal laws
Syncretism	Indivisibility of the knowledge of the socio-economic world
Autochtonity	The possibility of describing it without recourse to hypersensitive entities "in its territory"
Speculation	Reliance on human consciousness, language, literature and art achievements

Operation of any socio-economic system can be described in terms of five basic processes:

metabolism (exchange with the environment or, in a narrower sense, the transformation of the input streams into output flows);

reproduction (constant renewal of fixed reproducible conditions and operation, preservation and improvement of the characteristics of the system);

evolution (changes in the characteristics of systems based on self-organization mechanisms);

harmonization (internal space systems ensuring internal cohesion, coordinated functioning and development of the internal subsystems, as well as coordination with external conditions);

replication (producing identical systems).

G. Kleiner [75; 76] identifies four types of matrix-based systems depending on their being limited/unlimited (localized/nonlocalized) in time and space (Table 16).

Table 16

Classification of economic systems based on the space-time characteristics (compiled based on [75; 76])

Space length	Time duration	
	Limited. Time is localized	Unlimited. Time is not localized
Limited. Heterogeneity of space	The project system	The object system
	Construction; restructuring of a company; establishment of a company. Mission: innovative transformation of other types of systems, brining diversity in the structure of social and economic space of time. Typical product: transformation of economic systems	An enterprise; a city; a country; an individual. Mission: organization of disparate elements into a coherent whole during regular production, making the external economic environment diverse. Typical product: goods
Unlimited. Uniformity of space	The process system	The environment system
	The higher education system; science; art; diffusion of innovations. Mission: harmonization of all state and economic systems. Typical product: work	The Internet; regulatory and legal system of the country; the stock market. Mission: communication and coordination, creation of conditions for exchange between the various components of the economy, including transactions. Typical product : service

As far as it concerns the perception of the system as limited or unlimited in space or time, these attributes are subjective to a certain extent. So, one can talk about the severity of the characteristics of the system localization, the confidence in the belonging of a particular system to those chronologically or spatially bounded or unbounded. Given the incomplete certainty of the baseline information, one can identify four fundamentally different types of systems with the attributes of belonging to them being found in real systems to a greater or lesser extent, fixed by the observer with a greater or lesser degree of confidence.

According to G. Kleiner, [75; 76] each type of socio-economic systems is characterized by a certain tendency, immanent interest, which is to overcome the inherent limitations of space or time. There are also inherent preconditions for effective joint functioning of certain types or, incompatible types of systems. In addition, they participate in the division of functions

necessary for the operation of socio-economic universe. From this perspective metabolism, replication, evolution are evaluated. It turns out that the functioning of systems of object and environmental types increases the homogeneity of time, that is promotes a smooth transition from one period to another. Instead, design and process systems contribute to heterogeneity of time, difference between periods. However, the object and design systems increase the diversity of socio-economic space, while the environment and object systems harmonize space.

G. Kleiner's works provide for defining the type of the system "the sphere of communications" as a complex of communication, and justifying the structure of the communication complex in the economy, its development strategy.

Firstly, in the case of communication as a communication complex it is the type of environmental system. Its products are services and the major functions are communication and coordination, creation of conditions for exchange between the various components of the economy, including transactions.

Secondly, it is well known, that the main production factors, resources are divided into tangible and intangible. Each of these types requires a corresponding type of transportation. Intangible resources, such as information and finance, can be transferred by means of electronic technologies.

Thirdly, any system always has a guiding system, a managed system, the input and the outlet, certain limitations.

The structure of the communication complex is schematically shown in Fig. 9.

The author proposes to consider the communication complex structure of the national economy on the basis of systemic-synergetic methodology of functioning of economies.

The production cycle consists of basic stages: investment, production, storage, consumption. Transportation, that is moving or communication is a separate type of services which is classified as a separate branch. But transport characteristics are determined by the characteristics of products to be transformed. Intangible, abstract products (information services, knowledge, information of different types, money) can be transferred in both the material (paper) and intangible, e.g. electronic, format.

The diagram (Fig. 9) illustrates the place and role of communication in the structure of the national economic system, which makes it possible to

interpret the structure of the communication complex as a subsystem of the socio-economic system and as a structural component of each subsystem directly in the structure of the national economic system. In the market economy communications act as a communication product (both a service and a good). Therefore, in the system of state regulation the communication complex is subject to mixed regulation by the state and the market.

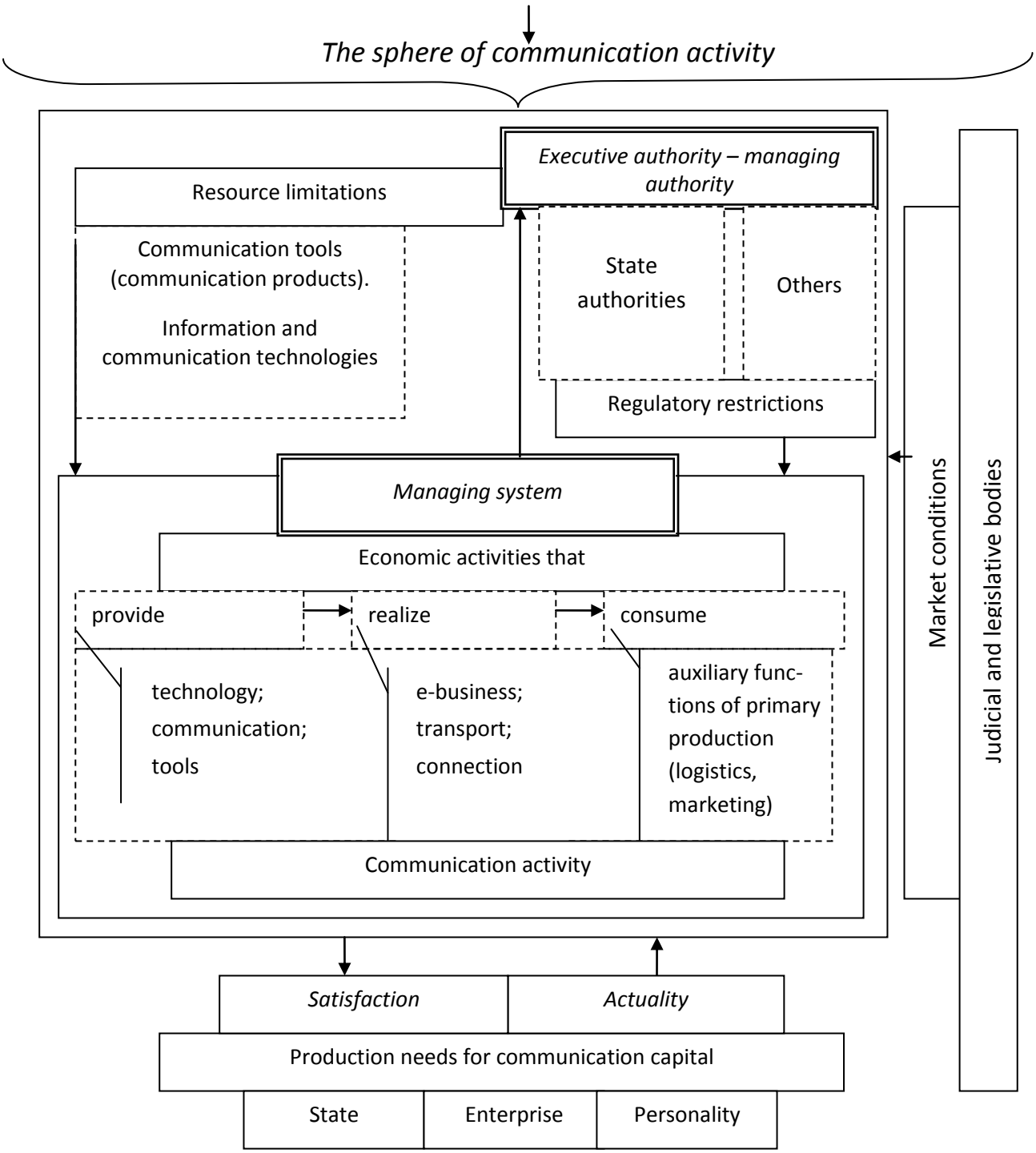

Fig. 9. **The diagram of the communication complex in the economy** (developed by the author)

In the system of consumption, distribution and reproduction the communication product sells its utility function: firstly, in the market of resources, and secondly, directly in the workplace, which is involved in creating value through the communication capital reproduction process in industrial economies; thirdly, it participates in the value creation of other types of capital as a final product in the production where communications are auxiliary functions.

To improve communication activities across the national economy, the elements of the communication complex should be structured and the links between them should be defined in detail. The solution to this problem is possible on the basis of a cognitive approach and methods of analysis of linkages based on statistical data "input-output".

The difference between the approaches to the classification of economic sectors in official and private analytical sources results from different perception of the degree of priority of the sectors with the objective preconditions for viewing the structure of the national economy of Ukraine. The Law of Ukraine "On the Stimulation of Investment in Priority Sectors of the Economy to Create New Jobs" [391] defines priority sectors as sectors aiming to meet the needs of society in a competitive high-tech environmentally friendly products, high quality services that implement the state policy for the development of industrial and export potential, creation of new jobs. The list of priority industries according to Art. 2 of this Law has been the authority of the Cabinet of Ministers of Ukraine since 2013.

The official procedure for classification of the economy sectors is set in the General Classification "The Sectors of the Economy of Ukraine" [331]. Thus, the main type of activity in the national economy can be determined based on the number of workers employed, the ratio of the total output of products (goods and services), the ratio of total income as received.

Analysis of practice in the field of telecommunication and communi-cation services has shown that corporate profits in this field are increasing rapidly.

The development of the telecommunications sphere of activity in the global space and a steady increase in profits justify the formation of a separate independent branch of the national economy or a separate

structural unit – the communication industry. That is, the integrated use of communication in the economy lets even talk about the idea of the economy communications complex. The evidence of this is the structural reform of the communications scope of the legislation. Thus, the decrees of the President of Ukraine No. 1065/2011 and 1067/2011 of November 23, 2011, abolished the National Commission for Regulation of Communications in Ukraine [339] and created the National Commission, which performs state regulation in the field of communication and information (NCRCI) as a state collegiate body subordinate of the President of Ukraine and accountable to the Verkhovna Rada of Ukraine.

With the Law's of Ukraine No. 2751-VI "On Amendments to the Law of Ukraine "On Telecommunications" (regarding the telecommunications market of traffic crossing) of December 2, 2010 having entered into force in January 2011 [202], the NCRCI received the right to define the markets of telecommunication services, to carry out the analysis of these markets and to establish operators with significant market advantage in its approved manner. The Law defined a clear selection criteria for operators playing a key role in various segments of the telecommunications market to perform a more vigilant oversight of such companies. However, the function of control over the competition laws was assigned to the Antimonopoly Committee of Ukraine.

Thus, the NCRCI is a guiding element of communication activities in the market of telecommunications and information services, an element of Ukraine's economy communications complex.

The rules of interaction in a single communication and information space should be designed to ensure:

everybody's right to freely collect, store, use and disseminate information by any lawful means, including getting acquainted with documents and materials directly affecting their rights and freedoms;

copyright protection and protection of the rights of property ownership to information resources, information technology and tools to support them;

forming and using information resources in terms of equality of all forms of ownership by creating an information market and competitive environment, the state antimonopoly policy;

forming the communication and information security and responsibility of a single communication and information space for the offense during the

formation and use of information resources, in particular personal responsibility of heads of government for the quality of the formation of state information resources and access to them;

consistency and making use of a single communication and information space;

close information cooperation with other countries and active information exchange in the international cooperation.

The problem of communication and information security is related to the insufficiently managed development of communication systems and networks. This leads to undesirable trends that could affect the strategic interests of the state:

computer information systems of national importance that are strategic in nature will be based on telecommunication systems on which the state impact will be limited, and the telecommunication technologies themselves might not meet the requirements of information security;

the whole telecommunication environment in the country will be a separate set of technologically incompatible telecommunication systems, technologically unmanaged in terms of state system position that will not achieve the reliability and viability of telecommunication system state in accordance with the requirements of safety and invested resources;

the level of tariffs for the transmission of data may increase because of a small number of users and limited time of the use of modern telecommunication equipment.

Currently, the market of communication and information technologies, tools, products and services (hereinafter – the information market) is one of the most dynamic sectors of the global market. The communication and information market has its own characteristics that significantly distinguish it from others:

heterogeneity of the market in the regions;

the state acts on the market as the main consumer, that is, generates market while not acting on it as a producer;

in the communication and information market the sector of personal consumption is unevenly developed and therefore the industry of services designed to meet the individual needs of the population is not developed.

The weakness of the legal regulation of the communication and information market also imposes serious constraints on its development.

The main areas of investment, customs and tax policy, that can greatly stimulate the development of the communication and information market should be:

the development of a strategy of state conduct in the market of communication and information in accordance with the general economic policy;

the development of a complex of legal and regulatory provisions that will ensure the implementation of these strategies.

It should be noted that considering the technical and technological component, public communication and information policy should focus primarily on the integrity of the formation of national information resources, on a systematic approach to the development of the information infrastructure, which in turn suggests that the communication and information space which is formed (through integration of its components) will be really unique and effective.

Chapter 5
The ideology of the communication society

Attempts of catchup development suggest, that no economic system is capable today for rapid development without a large-scale borrowing of technology and knowledge from developed nations, without active export of its products to the markets of postindustrial countries, as they have sufficient purchasing power. At the beginning of the new century the world situation does not objectively allow any country to enter a postindustrial community without its consent and without its active support, such as the country's accession to the WTO. Thus, the quality and result of communication processes directly affect the position of countries in the world.

The potential and prospects of development of societies in the information age are determined by the following main aspects: economic, technological, organizational, social, ethical and environmental. The author considers it necessary to add the communication aspect.

Currently, some researchers, such as G. Mernikov and A. Shevtsov [336] believe that after the collapse of the Soviet Union, the US is virtually the only political and military superpower. The US occupied 3rd place in the ranking of human development in 2013 and can influence the international socio-economic and political processes from direct military intervention (Gulf War, 1990) to initiating international sanctions (Iraq, Libya, Yugoslavia – in February 27, 2011 the UN Security Council imposed sanctions against Libya).

However, detailed analysis shows that the US mainly takes the way of creating technologies and products that are quite widespread and standardized, although at times have a global significance (unified MS-DOS systems, applications that manage online search, the most advanced technologies in computer science, bioengineering). The postindustrial US economy in many respects seems to be fused with the industrial ideology, and it should be noted that the success of the US postindustrial economy is still largely reached by the same methods that brought it to the vanguard of the social and economic progress in the era of industrialism.

In these circumstances, the development of the communication sphere can solve pressing problems in Ukraine, but it will not make Ukraine a post-industrial state. A significant part of the national wealth of the postindustrial countries is presented today by the intellectual capital of their citizens, intellect-intensive manufacturing and a developed infrastructure of services.

The formation of Ukraine as a postindustrial country is associated with certain characteristics. It has universal, but outdated production capacity, certain natural resources, a significant domestic market and skilled labor. All these important qualities are associated with past industrial success in the region because modern Ukraine needs investments in innovative technologies and creation of the conditions for Ukraine's integration into the information society. Political and economic elite of Ukraine should focus on how to establish a production that can compete with foreign models, more actively build and reveal the intellectual potential of the nation, develop the scope of communication activities. It is necessary to create conditions of economic information and publicity attractive for foreign capital investors, as well as creators of new production capacity rather than getters of local natural raw materials.

Computerization as one of the main trends of the world economy is in the focus of many researchers at present. The spread of information and communication in the practice of modern socio-economic activities is both a cause and a consequence of a qualitatively different stage of socio-economic relations, namely the development of postindustrial economy.

The term "postindustrial society" became widespread after the publication of the conceptual work of Harvard University professor Daniel Bell "The Coming of Post-Industrial Society" in 1973 [14].

Previously, before Daniel Bell, the concept of postindustrial society had been used as a scientific term at the beginning of the 20th century by the scholar Ananda Coomaraswamy, who specialized in preindustrial development of the Asian countries and by the Latin American social philosophy researcher Ivan Illich in the 1973 publication "Tools for Conviviality" [275]. Ivan Illich used the term "conviviality" as opposed to industrial "productivity". He believed conviviality to be individual freedom, based on personal independence, such as an internal ethical system. Post-industrial society, according to Ivan Illich, should be based on the fact that any person's ability to express themselves did not need artificial conditions of coercion to work, education, leisure, consumption and so on. Any human activity must be free and associated with pleasure, that is accompanied by positive emotions. Positive emotions are also formed in the process of communication.

The concept of postindustrial society by Daniel Bell is based on the distribution of the historical development of humanity in three stages: preindustrial, industrial and postindustrial.

Qualitative changes in socio-economic processes are globally supported not only by the numerical characteristics of statistical calculations and the practice of economic actors. Philosophers, sociologists, economists – a wide community of researchers of different scientific fields – also noted qualitative changes and coming of a new social and economic structure – a postindustrial society.

The concepts presented in Table 17 are similar to the postindustrial theory, namely information society, posteconomic society, postmodernism, the third wave, the fourth formation society, information civilization, i.e. a public information stage of production.

Table 17

The concept of the research on the development of the socio-economic structure (generalized by the author)

The key term. The idea of the concept	The author	The publication
Knowledge industry. Knowledge economy	Fritz Machlup	The Production and Distribution of Knowledge in the United States, 1962
The new industrial state	John Kenneth Galbraith	The New Industrial State, 1967
Late capitalism	Ernest Ezra Mandel	Der Spätkapitalismus, 1972
Information processing society	Tadao Umesao	Sociology in Information Societies, 1964
Information society	Kenichi Koyama	Introduction to an Information Society, 1968
Information society, Information civilization	Yoneji Masuda	The Information Society as Post-industrial Society, 1981
Information economy	Marc Uri Porat	The Information Economy: Definition and Measurement, 1977
Postindustrial society	Daniel Bell	The Coming of Post-Industrial Society, 1973
Information age	Bill Gates	The Road Ahead, 1995
Funky business. E-economy, emotional economy	Kjell Nordstrom, Jonas Ridderstrale	Funky Business, 2002
Communication society	Suggested by the author	

Investigation of the modern development of socio-economic formations outlines two approaches:

1) division into periods based on certain criteria;

2) the content-descriptive approach (Table 17).

The first approach focuses on the differences between the new state of society and the previous ones; the most characteristic feature of these concepts at the level of terminology is the use of the prefix "post-" concepts. Defining the new socio-economic structure with the use of the prefix "post-" provides an opportunity to highlight eras and oppose the new society not to the history of society on the whole, but to its separate stages (preindustrial,

industrial and postindustrial society according to J. Bell [14]; premodernist, modernist and postmodernist era according to J.-F. Lyotard [282]; first, second and third waves of civilization according to A. Toffler [241].

Timing of certain criteria is presented primarily by supporters of the theory of postindustrial society and the concept of postmodernity.

The ideas of postmodernity are widely used in economic, philosophical and sociological works. Some researchers specify their approaches speaking of a postindustrial capitalism, a postindustrial socialism, and an ecological and conventional postindustrialism. The general statement is the reducing role of material production and development of the service sector, the intangible nature of human activity, changes in the nature of the social structure and relationships.

Representatives of postmodernity do not only pay attention to economic processes but to the formation of a system postmaterial values as well. Thus, the value of using a person's creative potential is emphasized, namely the becoming of a new type of family and forms of social partnership, enhancing the role of knowledge in social self-realization, changing the education system, national and ethnic integration processes. All the above listed values cannot be formed beyond the communication process.

At the same time the ideas about the modern society as postbourgeois, postcapitalist, postentrepreneurial, postmarket and other ones are developing.

The ideologists of postindustrial society, in their social and philosophical studies, offer a particular vision of the historical process which can be described as a three-stage concept. The industrial society is opposed to the agrarian (or preindustrial) one, as a precursor, while the postindustrial (information) society is positioned as a successor. But A. Toffler stresses that the postindustrial society does not replace the industrial or even agricultural society. Many countries are simultaneously affected by two or even three quite different waves of change. Thus, the information society adds a new dimension, particularly in the area of data and information, which are a necessary component of society that is becoming complicated.

The second approach aims to identify the key characteristics of the socio-economic structure, selection of a feature, which is most characteristic of the modern time period (Table 18).

Table 18

The content of the stages of socio-economic formations (developed by the author)

Stages	Characteristic features	Value	Main institutes	Symbol
Preindustrial (agricultural)	Labor-intensive technologies. Using muscle strength. Skills that do not require long learning. Exploitation of natural resources	Land	Church. Army	Sower
Industrial	Machine production, capital-intensive technology. Using technology and means of production requiring long education	Capital. Workforce. Means of production	Corporation. Production organization	Conveyor
Postindustrial (information, communication)	Knowledge-based technology. The creative aspect of a person, continuous education. Growth of communications	Knowledge. Information. Moral. Communication	Transnational corporation. University	Computer. Communicators

Supporters of the content-descriptive approach define the new state of civilization through the examination of its individual features; attention is often focused on the phenomena that do not directly determine society as a social unit. The most famous attempt is the use of the term "information society" introduced virtually simultaneously in the US and Japan by F. Machlup and T. Umesao [283], which initiated the theory developed by such famous authors as M. Porat [293], J. Naisbitt [287], Y. Masuda [285], T. Stonier [300], R. Katz [276; 277]. This approach examines the evolution of humanity through the progress of knowledge. This concept directly includes the concept of a technetronic (from the Greek *Techne*) society by Z. Bzhezinski [17] and the concepts that emphasize the role of knowledge and denote modern society as knowledge economy: knowledgeable society, knowledge society or knowledge-value society.

It is important to note that the theory of postindustrial society brings together both economic and sociological, psychological, political, philosophical areas of research. This is determined, in the opinion of the author, by the globally covered methodological principles and concepts.

Supporters of postindustrialism base on the materialistic approach to the study of social phenomena. The focus of analysis is economic, organizational and technological aspects of production, distribution and exchange, while the social and psychological features of mutual relations in society, the question of political power, the ethics of the ideas of exploitation are out of attention. From the author's point of view, it is communication processes that are at the forefront of shaping the quality of life.

The most common concepts used to describe the new stage of social development are postindustrial society and information society. In fact, these terms are close, even identical in content, because postindustrial society is actually information, as information becomes the defining resource, while a priority activity is information activity. In this sense, the concept of information society is more specific than postindustrial society. Their common special feature is the fact that they absolutize the scientific and technological component of the coming era, which in fact does not exhaust the entire socio-cultural reality. Obviously, the most visible process that characterizes modern society is the informatization process, but along with

it there are other, less significant events related to the era of communication, such as: changing philosophical systems, changing approaches to scientific knowledge, review guidelines in the social and political practice.

The French philosopher Jean-Francois Lyotard [282] in his book "The Postmodern Condition" connects the society's entering in the postmodern period with the processes of inclusive informatization, which became one of the reasons for changing the status of knowledge and the emergence of a specific postmodernist vision of the world.

In order to justify the author's position it is necessary to find out what exactly makes the postmodern and postindustrial theories identical and based on what one can draw a parallel between them. In this regard, one should focus on the specific changes occurring in the economy of developed Western countries in recent decades; pay attention to new basic principles of the new socio-economic system, namely, diversity, pluralism, decentralization, fragmentation.

In the manufacturing sector, the major changes are mostly associated with the transition from mass to small-scale nature production – the principle of standardization is gradually replaced by the principle of diversity. From a technical point of view, this was made possible by the introduction of new computer technologies. In turn, the success of technologies that avoid a common approach in the industrial and economic sphere, is largely due to higher needs in the hierarchy of needs by Maslow, namely human desire for self-actualization. From a philosophical point of view, mass production and consumption, mass duplication of cultural standards and norms of perception of reality is an expression of the priority of the total over a part, of the common over the individual, of the single over the multiple, that is the substitution of individual values by the common ones. Such trends are peculiar to the industrial stage of capitalism which expresses the ideology of modernism when society turns into a totality which dominates a specific person.

The theorists of postindustrial society see a solution in the development of technologies, mainly electronic, i.e. reserves of humanization of technology are to be found in the deployment of the technical progress rather than in abandoning it. It is only the development of computer technol-

ogy that made possible the departure from mass production – production has become more flexible and designed to meet a variety of individual needs.

The principles of pluralism, decentralization and fragmentation that characterize the postindustrial society and are crucial for postmodernism are primarily in the establishment of diversity as a key message of the information society. As regards the economy, the variety is not only in the types of technology, product range and types of services, but in the need for a wide range of professions as well. Moreover, the worker of the "third wave" is seen as a versatile, inventive, proactive personality rather than a part of the conveyor, which can be replaced by any other one. As rightly pointed by A. Toffler [301], while the second wave technology promoted uniformity, the third wave technology provides social diversity. Of course, variety as a characteristic of postindustrial society is not only embodied in the economy but permeates all spheres and subsystems of society, changes which can be described by the categories of postmodern worldview.

The establishment of diversity as a fundamental basis guarantees pluralism, that is equal existence of a variety of positions, free communication; and postindustrial society creates certain conditions for the implementation of this postmodern principle.

Currently, decentralization covers almost all areas of society: in production, the processes of management demassification and downsizing of enterprises are observed; in the area of management, redistribution of power in favor of regional centers takes place, and basic planning is transferred to the local level. Regarding access to information, the latest electronic technologies offer opportunities for users to obtain the necessary information, regardless of the censorship of the center.

Along with the processes of decentralization and differentiation, integration trends take place in modern society. Thus, the processes of economic integration and the development of supranational economic and authority structures (such as the creation of the European Community and formation of cross-border economic clusters) make progress. There are simultaneous processes of globalization and differentiation in the media as well. But integration in the era of postindustrialism does not recognize the

supremacy of the center of power. In this case it is rather optimization of communications and coordination, whose purpose is the successful operation and development of the components of the socio-economic system "society." As a result it leads to the development of various subformations.

Undoubtedly, electronic telecommunication technologies play a special role in shaping the fragmented social and cultural subformations. They create the technical ability to develop an extremely intense information field, which almost universally surrounds the modern man and has the most selective, targeted nature.

In post-industrial society the departure from the centralized distribution of information occurs. This manifests itself in media development in the direction of increasing the number of publications and television channels, radio, addressed to different audiences, and distribution of cable and satellite channels. Virtually unlimited opportunities have appeared for access to information and communication through the Internet. The impact of information and communication technologies on the fragmentation of society into many small groups is in the fact that through them a person can be in the "fragment" of the information space which most appeals to him, while journalism, television and radio are one-way communication systems. The network computer technologies allow for two-way, interactive communication between people in real time.

The technologies of postindustrial society can extend entering the game element in human activities. In the postindustrial society, the ideas of Herbert Marcuse come true, these ideas suggesting that the principle of productivity must be replaced by the "pleasure principle" and consumer society morally corrupted humanity. According to him, a person must break out of the boundaries of material production – the dominion of alienated labor – and dive into the world of play and imagination. Work is a means of expression and realization of individual abilities which is possible with its transformation into a game, a kind of holiday. According to V. Krasilshchikov [89], H. Marcuse's radical left ideas are embodied in a personal computer. The computer opens a real opportunity to make labor a kind of game and let the man out of control of techno-bureaucracy.

Thus, postindustrialization predetermines the conversion of the process of work into a kind of creative activities for which opportunities increase with modern technology entering people's life.

Synthesis of the publications suggests that there are basic ideas that characterize modern trends in communication, postindustrial society:

lack of constant basic epistemological axioms for different objects of knowledge (the inadequacy of ideas about uniform criteria regarding the truth of any statements);

heterogeneity, mosaic and integrative nature of modern objects of knowledge;

priority of the individual over the general;

domination of the principles of diversity, pluralism, decentralization, fragmentation.

Thus, scientific and technological achievements of the late second millennium show today's society as being not only informational but also a communication, postmodern, postindustrial society. The period of the post-industrial society communication is difficult to predict. But no doubt it will be determined by a certain pace of scientific and technological progress.

Western sociologists usually talk about laying the foundations of postindustrial society as a process that began after World War II and has been progressively unfolding up today. Meanwhile, the formation of a new social reality, in the opinion of V. Inozemtsev [62; 63] was and is contra-dictory and uneven.

Describing the environment in which postindustrial groups develop, researchers noted not only strictly economic contradictions that give rise to cyclical and structural crises (which is most clearly illustrated in the work of A. Toffler [241] about the problems of "ecospasm"), but environmental problems as well. In addition, the category of conflict is researched as one of the most important characteristics of this era. Conflict is always a product of communication. It is exemplified by global conflicts, that constantly arise in relations between East and West, North and South, and conflicts at the microlevel, as evidenced by a significant number of cases.

Despite the active integration processes and promotion of tolerance, the problem of conflict is increasing and growing. According to the theory of

the world system of Immanuel Maurice Wallerstein [302; 303], the type "world – economy" is integration based on a three-tier structure: the center – the semiperiphery – the periphery. Despite the rapid progress of technology only some of the developing countries can take full advantage of its results. For most countries the technetronic era only resulted in the heightened understanding of the inaccessibility of advanced living standards and consumption. The contradictions of this kind are becoming more urgent because of the growing migration of the periphery and semiperiphery in Western Europe and the US. The governments are often unable to find adequate measures to counter this process and sometimes also stimulate it. Enhancing Islamic ideology and policy as well as economic growth in China in the twentieth century created opportunities for forming new world economic centers that are capable to change the trend of the 1990s in the case of unforeseen developments.

Despite the fact that most postindustrial countries abandoned the territorial expansion as a political objective and focused on the economic and technological development, constant communication, even invasion (expansion) of one state into the cultural and economic space of another one take place within the framework of globalization through the use of various financial instruments. Typically, multinational corporations serve the primary actors of such interventions.

Confirmation of this view is in the position of M. Archer [11]. Thus, in the opinion of M. Archer, globalization is the process that leads to covering the whole world with interconnected structures, cultures and institutions. Globalization, says M. Archer, means that society today is no more primary units of socio-economic analysis. M. Archer argues that society should be regarded only as a system surrounded by other systems and so as a subsystem of the world community.

International companies operate in the global commodity and financial markets based on high technologies, and labor competes on the global labor market. The neoclassical model of closed market economy is becoming transnatsionalized. J. N. Rosenau [295; 296] in the international relations theory, predicts the development of civilization toward "one world". Member states, according to J. W. Meyer [306], are only subsystems of the total world politics.

In turn, M. Bortova [310], considering the problem of transnationalization, suggests interpreting the term "globalization" not only as a relationship of internationalization of the economy, the development of a unified system of global interconnection, changes and weakening of the national state functions, but also the revitalization of transnational nonstate institutions, including such as ethnic diaspora, religious sects, mafia groups.

This idea is not contrary to economic reality, which shows that free trade and the economic tripolar structure of the world (the center – the semiperiphery – the periphery) is opposed to various subnational associations today. These include the southern and eastern regional cooperation where their autocratic development helps create the opposite center of power in respect of old industrial countries. The latter are seeking to unify a number of national legislations to create certain international spaces with a common policy in the economic and social sectors (for example, the development of a common constitution for the EU). The main difficulty in the construction and subsequent expansion of such spaces is that the policy of globalization requires national state coordination of certain formerly independent decisions of other national states and the subordination of their interests to the interests of the states of the community.

Chapter 6
Internet communication as a feature of the communication economy

The concept of Internet communication originated in the 60s and began to develop actively, starting with the introduction of the World Wide Web. The definition of the paradigms of the idea of Internet communication requires description of the scope and methods of implementing the system of concepts (basic concepts), constituting Internet communication and discovering the basics of understanding the value of these communications.

The traditional definition of the term "communication" was discussed in the second chapter, mostly it is the transfer of information.

Internet communication, spreading in everyday life, makes fundamental changes in the structure of the media of social communication. "Mass communication is the transfer of information from person to person through the use of various channels and media" [268]. Since the 1970s, the scientists J. Blumler,

E. Katz, M. Morris, C. Ogan, E. Parker, K. Rosengren, J. Walther have been involved in new communications technologies and they have been implementing them in a social system [268; 286; 291; 297; 304]. The researchers have faced conceptual problems because new communication technologies are studied with the use of previous communication theories and their corresponding categories and methodology of early technologies. V. Arshyniv, Y. Danylov, V. Tarasenko rightly believe that such concepts as information, exchange of information, storage of information are not sufficient to explain the processes occurring in the complex system of the Internet [308]. The network is used for storing and processing information; it is compared to the ocean, which is "required" for the storage and treatment of water. Sometimes this is true, but not always – there may be more interesting things in the ocean.

Obviously, the changes taking place in the theory and practice of communication require new scientific approaches. E. Parker is right in his idea that in terms of new information technologies a completely new program of studies of the effective use of technology is required [291]. In practice, the methodology of analysis often uses the methods of research that are used for traditional media (e.g. determining the number of users, frequency of broadcasting information). One should also agree with D. Bryant, S. Thompson that the lack of theoretical models that illustrate the transactional nature of modern means of communication, is aggravated by the rapid development and spread of new communication technologies [21].

The communicative environment, mediated by the Internet provides the traditional forms of communication with an original and independent character. Techno-mediated communication is both a means of interpersonal communication (one – another) and a mass media (one – many, many – many, many – one), Table 19.

Table 19

The techno-mediated communication (developed by the author)

Interpersonal communication	Technical advices
one – another	Telephone, postal services, Internet
one – many	Internet, printed matter, radio channels
many – many	Printed books, radio-television, Internet
many – one	Internet, telephone, postal services

The modern Internet communication includes all dimensions of social interaction: economic, political, social and cultural which could affect the nature of social life. The Internet as a means of interactive communication has reached a high level of development and the impact on public life; that is why it provides new perspectives for both interpersonal relationships ("dual" social relations) and building the community ("networks" of social relations).

There are many definitions of the Internet. According to E. Zhuravlova [57] the systematic approach treats the Internet as a type of a complex self-developing system which consists of interconnected heterogeneous elements and subsystems, properties and relationships created by people based on feedback and operating within certain limits. The elements of the Internet systems are: technical resources, information resources, software resources, technologies, qualified experts, energy resources and users. The sociological approach focuses on communicative abilities and social relations of people interacting in the global information environment. From this point of view I. Zasurskiy [58] defines the Internet as a set of communication channels, communication environment. A. Sokolov [226] specifies this definition based on the essential features inherent in the network: "The Internet is a global social communication computer network designed to meet the personal and group communication needs through the use of telecommunications technologies".

Based on the given approaches to the concepts of the Internet and Internet communication, one should provide the basic concepts of this new system: virtual reality, a virtual entity, a virtual image, a network organization, the Internet business, e-business, e-government. For example, the Internet is space, and the subject that is in it. It is involved in direct interpersonal communication, exchange of thoughts and feelings with other subjects presented in this space. The term "virtual space" or "virtual reality" has appeared.

Getting to the network, the subject gets involved in the Internet communication, reporting information to the network and perceiving it indirectly. Analysis of different forms of communication on the Internet suggests that the Internet thanks to anonymity, accessibility, invisibility, plurality, security and ease of use creates the conditions for the manipulation of an individual

identity. In the course of Internet communication, construction of virtual personalities becomes possible that may cause Internet addiction. Thus, in the system of Internet communication, a virtual entity and a virtual image are some of the elements. Perception of man by man is remote from the basic categories of social cognition, which are expressed in appearance, such as sex, race, age and belonging to a certain social stratum.

W. Dizard [270] indicates the difference between the new communication technologies and mass communications, where some signs of Internet communication can also be seen: decentralization of sources of messaging, interactive format of distributing information products, consumer control over the content, time and form of obtaining the selected service. There is no doubt that the Internet communication is an interactive multimedia communication that can provide the necessary information to users at any level of interest, and has no single point of management. As a result, there is a characteristic of decentralization and the concept of network organization.

The new social structure in the form of a network society is the foundation of the new economy. According to M. Castells and E. Kiseleva [71; 72] this is a new type of communication, information and global economy. In other words, knowledge and information are key sources of productivity and competitiveness of these two decisive factors in any economy. The information economy is organized around information networks that have no center, and is based on constant interaction between the nodes of the network, no matter whether they are local or global. The constant adaptation to eddy-like changes in the environment in capital, supply and technology is the essence of this game. The only rule is complete absence of rules. If they still exist, they do by using many networks.

The concept of Intrenet business becomes another defining concept of Internet communication.

The development of new forms of information transfer on a global scale will certainly entail changes in social processes. Thus, the classical theory of information society, such as the information-technology paradigm of M. Castells explains social system changes under the influence of information technology, and using the social network theory of M. Castells makes it possible to consider the Internet communication model. In turn, the theory of society

virtualization, discussed in the works of J. Baudrillard, R. Barth, N. Luhmann, helps determine the source of virtualization in the use of Internet communication, and explore the category of online communication resources [102].

M. Castells gives his version of the concept of the new economy – information society – through the analogy with the term "industrial society" with the predominance of the idea of the industrial basis of industrial relations. He said: "Industrial society (a usual notion in the sociological tradition) is not a society where there is industry, but society where social and technological forms of social organization permeate all spheres of activities, ranging from dominant ones – in the economic system and in military technology – to objects and practices of everyday life" [71]. The term "information society" in the treatment of M. Castells indicates a special sign of social and productive organization in which creation, processing and transmission of information are basic sources of productivity and power because of new technological conditions in the given historical period. The main distinctive characteristics in the communications economy are presented in Table 20.

Table 20

The distinctive characteristics of the communications economy

(developed by the author)

Characteristics	Industrial	Communicational
Types of communication	Interpersonal communication. Mass communication	Internet communication
The degree of openness of information	Centralized and selectively classified	Open, distributed
Forms of information resources	Printed matter. TV products. Radio products	Online resources
The basis of social inequality	The level of knowledge	The level of access to information
The principle of information transfer	Address	Networking
The nature of the production processes	Real	Virtual
Character motivation and transmission	Cognitive consumer; communicative	Playing

The new economy is not only characterized by globalization and active integrative processes. A new vector of society transformation is being developed – virtualization as a transition of key activities into the virtual space of the Internet. Information and communication of people are activities carried on-line on a mass scale.

Network relations of production lead to simplification of class relations. This does not eliminate exploitation, social differentiation and social resistance. But, according to M. Castells, social classes based on production in the form they existed in the industrial age cease to exist in the network society [71]. Relations of consumption (i.e. culturally meaningful, differentiated appropriation of a product) are determined by the interaction between the relations of production and culture. Implementation of networks in industrial relations results, on the one hand, in the individualization of work and increased differentiation and inequality of consumption. On the other hand, the fragmentation of culture and personalization of positions in industrial relations leads to growing diversify in consumption patterns, life styles. Power relations also undergo changes: the hierarchical principle of organization is replaced by the network. Power relations that continue to exist in society, take a different form: "The power of information flows prevails over the flows of power" [71].

In information society, as Castells believes, there is a transition from the "Gutenberg Galaxy" to the "Galaxy of McLuhan" [71]. A society in which television dominates, can be described as a system of mass media. Formation of mass society and the emergence of mass culture was largely due to the fact that the new electronic communications technology was controlled by governments and oligopoly of large corporations. However, the most significant change brought to the social life due to the advent of television, consisted in neither centralization nor its potential as a weapon of propaganda. TV meant, above all, the end of the Gutenberg galaxy domination, i.e. communication systems in which typographical thinking and phonetic alphabet dominated. The galaxy of McLuhan has been formed: "... TV completes a series of sensory perception of the world by man. With the ubiquitous ear eye that moves, we destroyed the letter – an audio-vizual metaphor that is the pace of Western civilization. TV introduces the practice

of active research approach that includes all feelings at the same time, not one vision. You have to be "within" television images projected onto you. You serve a screen. Photos are around you. You are the point of extinction. This creates a kind of focus inward, a reverse perspective... " [71].

According to some authors, the logic of network communications becomes dominant, destroys inappropriate communication models. The role of traditional social communities in the mass media began to decline. They saved their influence only in those of them who have accepted the logic of the network. According to M. Castells, from the standpoint of modern society, electronic communication is the inherent communication. With "digital, network communications all types of messages in a new type of society work in a binary mode: presence or absence in the communication multimedia system. All other messages reduced to individual imagination or to subcultures are becoming more and more marginalized, personal contacts dominate there. But this does not mean that the process of homogenization of manifestations of culture and complete mastery over codes from multiple senders occupying the central position takes place. Through diversification, multimodality and instability of the new communications system it is able to embrace and integrate all expressions of interests and values, including the expression of social conflicts" [70 – 72]. The cost of the inclusion in the system is the adoption of its logic, language, encoding and decoding, i.e. its values.

In the opinion of M. Grachev [38], the scientists have been recently more and more writing that humanity is entering the time period where the image of the world created by the media, and especially television, and in recent years with the help of the Internet as well, does not largely coincide with reality. New communication technologies create a fundamentally different, previously unknown "global space – time": local, limited space is literally becoming global and the specific time is getting rather relative, because when and how an event was presented and perceived is more important than when or how it took place [38]. With the increasing role of communication in the modern world, many key issues of social and economic development today can be defined in terms of the impact of information and symbolic content taken and transferred to the media industry, translated into everyday life typical conditions in which information products are perceived by recipients.

D. Ivanov [60] rightly insists that in a society where people lay no less and sometimes even more emphasis on images rather than real events, the development of information technology may not be otherwise, but through the creation of systems of centralized management and programming of social processes [60]. Accordingly, the use of the media and control over the content of the transmitted messages in the period of transition to an information society is one of compulsory prerequisites for the implementation, maintenance, and, if necessary, the conquest of power. Communication as creation of images in modern society plays a crucial role, according to G. McLuhan, R. Barth, J. Baudrillard, N. Luhmann and M. Castells [70 – 72].

Familiarity with the works of the above researchers suggests that the logic of network communications begins to form the character of all communication processes, including mass communications, despite the fact that the communication network directly covers no more than one tenth of the total population. First, it is determined by the fact that the opinion leaders in the vast majority already belong to the communities represented in the Network. But the most important here is not even a formal affiliation with network communities, but the functional dependence of their language, codes, communication organization. It is important to emphasize the effect of increasing speed of network communications and redundancy of information files. In an era of information explosion of the second half of the 20th century the growth of the velocity and volume of information processes led to the formation of a mosaic culture, postmodern aesthetics, influenced by the appearance of the postnonclassical scientific paradigm, the so-called countermodernism. Now scientists are trying to understand the situation where we are witnessing network information flows' multiplying, accelerating and growing. They also predict a qualitative change in all social practices in the near future. In the fields of formation of communication community ideologies a situation is observed where ideological transformations occur repeatedly in short intervals, changing not only the mental configuration, but the structure of past experience. One can say that the characteristics of communications are not less important than economic and political factors in determining the current social structure and the course of change.

The model of the modern Internet business proposed in the literature, can be described by the main elements: IT = IB + IC + IM + IO + IU ... where IT is Internet technology; IB is Internet business; IC is the information component; IM is Internet marketing; IO is investment opportunities; IU is the Internet user.

However, this model is just a list of part of the elements characterizing the features of electronic communication.

The elements of the communication cycle (chapter 2) define the basic elements of the model of Internet activity and activities determine the areas of self-development of Internet activities (Table 21).

Table 21

The development of Internet activity (represented in practice)

(developed by the author)

Basic types of activities	Internet activity	
	Commercial online business	Non commercial
Studying	Internet universities	Internet library. Supporting resources
Game	Online games	Online games
Labor	Manufacturing of an intangible product	
Communication	Internet connection exchange	Social networks
Management	Programs of distant support and influence	E-government

Given the characteristics of the production cycle of communication products (chapter 2) one should note that there are problems in the development of Internet business, that hinder this development and are based on the principles of the main stages of production (Table 22).

Table 22

The problems of Internet business (developed by the author)

Stages of production cycle	Problem	Example and direction of development
Investment, purchase	Safe transfer	SWIFT, coding of information
Production, processing	The development of technical processing, development of communications services	Options of Internet traffic, the possibility of creating technical services
Transportation, storage, marketing	The development of the transport infrastructure which provides short-term delivery	Types of advertising, delivery types, contextual and media advertising, delivery express, New Mail
Purchase, consumption	The development of the financial infrastructure that provides secure payment means – the use of tools and the competence of consumers	Means of payment. PayPal. Communication products provided to consumers

The main direction of modern Internet business is the contextual advertising mechanism that provides attraction to a lot of small businesses and private entrepreneurs with small budgets ready to spend a small amount on the customer "cry". There is no marginal cost on this advertising market, advertisers are free to choose how much they are willing to spend a day on Internet advertising and how much to pay for each visitor drawn by the advertisements.

Another area of advertising is media advertising with placing the world's largest brands, which are ready to pay a fee for services, for example, raising up their page in the section, additional posting a photo or video on the main page, advertising their blog.

Internet auctions are actively developing projects, these allowing individuals and small companies to sell goods over the Net. The core set of services on the auction site used to be free, now agreements are charged a few percent of the amount that is deducted from the user's individual account

(the account balance may be negative). An example of such auctions is molotok.ru, ebay, www.AUCTION.

Low consumer activity on the Internet is mainly caused by heterogeneity of Internet communications model elements. Thus, the Internet computer literacy of population is low compared with developed countries, online payments are insufficiently developed, a future purchase cannot be sensed actually.

In practice, there are different aspects of building an industry and, respectively, industry capital reproduction: technical, organizational, economic.

The production-and-technical aspect of building an industry is treated as the relationship and consistency of production processes, community of resources which are recycled, and materials, proportion and subordination of all production parts of the industry.

Production of the sector products (work, services) usually involves the implementation of various technological processes of processing (treatment) of resources, pieces of work – information, programs and messages. The process of obtaining the finished products involves some set of influences on feedstock (mechanical, physical, intellectual). That is, the manufacturing process of the communication sphere is a systematic and deliberate change in time and space of quantitative and qualitative characteristics of means of production and labor to make finished products (communication products) from input resources (raw materials) in accordance with the given program (the goal).

The set of processes of processing (treatment) of resources determines the technology of making communication products. The main phases of production of communication products are procuring, processing, cleaning (structuring), testing. As a result of exercising these stages the primary resource conversion into finished products – communication products – takes place.

Depending on the size and degree of completion of the process, the ongoing production processes in subdivisions are classified as follows: the primary element of the production process organization of the communication product is a job – a part of the production area where a worker or a group of workers perform special operations for the product or service manufacturing using appropriate equipment. Groups of workplaces are combined into production departments, where a relatively local part of the production

process is carried out – either finished communication product parts are manufactured, or a stage of the technological process is carried out. A department is the primary structural unit of the communication complex. The set of manufacturing processes determines the production structure of the communication complex – a set of basic, support and service units that provide the process of the system's input into its output – it is a ready communication product.

As a result of production processes a communication product is produced, which has different degrees of standardization: from highly standardized (standardized communication services) to a specific one (bespoke advertising).

In the first case, standardized technologies and resources are used. Typically, such industries are characterized by a high degree of automation and mechanization. Manufacturing of special products often features a unique nature of production, highly skilled workers involved, the production process being slow and less exposed to unification, more sophisticated control systems applied.

To characterize the industrial and technological structure, the production notions are used – the classification category of factors and elements of production determined by the nomenclature, the regularity and scale of production of communication products.

Depending on the degree of standardization and volume of communication products, the following types of production are distinguished (Table 23).

Table 23

The types of production in the areas of communications

(developed by the author)

Type of production	Characteristics	Notes
1	2	3
Single-piece production	Development of an individual information and communication project and production of small batches of communication products according to it	The project may be required for the development of a new or high-technology product, installation of a new production line. A typical example of such production is advertising

Table 23 (the end)

1	2	3
Production of lots	Making batches of communications services or of individual communication services with various specifications according to the customer orders	Typically, with this type of production to individual orders small batches of communications products are offered (produced). An example of this is the production of packages of communications providers with an opportunity of individual flexible formation
Serial production	Production of medium volume (series) homogeneous communication products	This type of production includes printing
Mass production	Production of large volumes of standardized products of communication areas	A typical feature of this production is a high level of standardization of both products and the necessary work, standardized communication services

At the present stage of development of the productive forces, the organization of production, harmonization and coordination of individual parts of the sphere of communication is one of the factors determining the efficiency of production and, in fact – the possibility of the communication industry.

The organizational aspect of building complex communication implies the organizational structure, relations and the relationship between the individual structural associations and administrative units of the complex, with central administration possible.

Relations between the individual elements of the communication complex are divided into vertical and horizontal. Horizontal relationships are characterized by coordination and are usually bonds of one level: relationships between competing companies, companies that produce complementary products or substitute products. Vertical relationships are subordination relations, the need for them arises when there are multiple levels of the technological cycle of production, i.e. the communication products production hierarchy.

While the industrial and technological structure of the communication complex presents the industry trend of resource flows (direction of complete production elements and the sequence of stages of the process), the management structure shows the direction of control actions. Within the

structure of communication complex management an appropriate process of state regulation takes place.

The variety of linear and functional relationships that can be established between individual objects, determines the diversity of self-organization structures of the communication complex. The scale and diversification of the production of communication products is of decisive importance. With a low and medium number of businesses and few linear functions and relations between them a linear structure is acceptable. With the growth of the communication complex and the increasing complexity of its resource flows the transformation of its organization into a functional structure becomes necessary. With further increase of production the functional structure transforms into a network and even chaotic one.

The following reasons for changing the structure of the branch organization of the communications complex are typical:

expansion of the functional significance of communication products;

strengthening of resource flows in the communications sector;

marketing development;

organizations of economic security required.

The economic aspect of the mechanism of development of communication activities implies a set of activities on planning, organization, accounting and control, motivation (the functional aspect) and a set of material, technical and financial resources to provide them.

It is important to emphasize that the basis of the economic aspect of the mechanism for the development of communication activities is just a set of management techniques. During the production process the resources are distributed and transformed into finished products of communication. Each element of this sector has its niche in the overall communication process: the user chooses from the best alternatives of communication products based on the selection criteria (e.g. price – quality).

Therefore, speaking about the economic structurization, the scope of communication activities should be seen as a combination of elements, each of which influences the final results, being responsible for a particular area of work, for the fulfillment of a production and engineering or management and administration function. In other words, the scope of communication is a set of responsibility centers. Depending on how a particular responsibility center affects the economic performance of the industry, the centers of responsibility may be divided into cost centers and profit centers.

A cost center is a set of types of subsidized production, or dependent production, satellite production, existing as industry elements that perform support and service functions, deliver semiproducts (ancillary services) to profit centers. Depending on manageability, the centers may be those with regulated and partially regulated costs. An example of a regulated cost center may be production of semi-finished products for communication services. Examples of partially regulated cost centers are nature conservation facilities, production of electricity. Commercial and nonprofit cost centers can also be selected. Nonprofit cost centers are units of socio-cultural and domestic purposes, not focused on profit.

Profit centers are sector elements which are centers of growth which provide income and increased financial flows. Profit centers and cost centers can be centers of investment if the profit center is located in the area of growth. In practice, responsibility centers are divided according to two principles: functional and territorial. The functional principle is used to classify the following cost centers: service – providing services to other centers within the industry; material – responsibility centers engaged in manufacturing and warehousing communication products; production – the main production units, the units involved in direct production; management – providing consulting and outsourcing; sales – performing the intermediary sales function.

Distribution of responsibility centers based on the functional principle complements the distribution on a territorial basis.

The social aspect of the formation and development of the industry is linked to the social effect and manifests itself in terms of quality of life.

Chapter 7
The introduction of e-government

The concept of e-government appeared in the West in the early 90s, but its practical implementation began only in the late 90s of the twentieth century.

The definition of e-government by the World Bank [398] stresses that this is the use of information technologies enabling government agencies to transform the relationship between citizens, business and other branches of

government; e-government aims to make the interaction between government and citizens (G2C), government and businesses (G2B), and between government departments (G2G) more open, comfortable, transparent and uncostly.

The key preconditions for the formation of e-government were the formation and development of postindustrial society of information and communication technologies which has certain features [273; 411; 412]:

1) new expanding forms of communication along with the possibility of accumulation and processing of information;

2) the transformation of the structure of communicative experience of a person – there is a need for "building", constructing the image of both the partner in the communication and the rules of interaction with him;

3) there is a problem of trust/distrust in the information provided;

4) the basis of communication is not information, but the process of communication;

5) the basis of new social inequality is not the level of knowledge but the attitude to information;

6) the spread of the network principle of communication.

The network communication principle complicates any algorithmization of business activities, because it is based on the idea of continuous development, i.e. building the productive and communicative process. The practice of virtual manufacturing organizations and virtual communities shows that a significant transfer of information and financial flows into the Internet makes difficult the control over them. One reason is the vagueness of the status position of staff working in virtual networking organizations. Blurred positions and the disappearance of the usual responsible persons made impossible the classic administrative effect. Instead, new centers of influence are formed – the people or groups of people that play a key role in organizing communications. In turn, the accumulation of amounts of information makes high demands on their semantic interpretation by man – the subject and object of communication.

But the invention of a system of hypertext and the emergence of the World Wide Web formed the conditions for the practical implementation of the idea of state regulation by providing public information and commu-

nication services that are controlled at a distance and are intended to inform the public about government activities and ensure the provision of government services to individuals and legal persons, form an effective relationship between the state and citizens to create a civil society.

Singapore was the world's first to implement the idea of the government portal eCitizen Centre (www.ecitizen.gov.sg). Besides Singapore, other countries such as Japan, Korea, Canada, Austria, Germany, USA have considerable practical experience. For example, e-government was introduced in the United States by the Memorandum of President Clinton in 1999, and in 2000 the project FirstGov started uniting about twenty thousand sites of state authorities at different levels. At present, the Office of e-Government and Information Technology (E-Gov) headed by the Chief Information Officer of the Federal Government (CIO) operates in the USA. The e-Government develops and provides the use of Internet technologies to facilitate the interaction of citizens and business with the Federal Government, to reduce costs and optimize taxpayers' and citizen' participation [429].

The US strategy of e-Government since 2002 lists the benefits and the purpose of its implementation: improving the quality of services for citizens (citizens are able to obtain a service or information within minutes or hours); citizens, businesses, state and local authorities are able to submit the required reports without having to hire accountants and lawyers (civil servants do their job as effectively as their counterparts in the commercial sector).

Korea is known for its projects e-Korea (1999) and u-Korea (2007 – 2008). As part of the above initiatives, in Korea, there is an interesting idea of a u-City, which is implemented on the local initiative through local projects. The basic idea is to make the city a tourist center, a so-called ubiquitous tourist town [412].

Historically, the author of the idea of everywhere space is Japan. In 2003, in the second national development strategy of e-Japan it was determined that the everywhere network is the information and communication technological environment through which users can be connected anywhere, always and to any network. The main objectives of this strategy are to develop the infrastructure of everywhere networks (the broadband infrastructure of the e-Japan strategy); to promote information and communication technol-

ogy initiatives to address social and economic problems which faced Japan instead of active dissemination of information technologies in society; to form a safe information and communication technology environment that would meet the requirements of network environments everywhere [412].

Information needs of the citizens of Austria are satisfied by the project "Help.gv.at" (Help), launched in 1997 by the Federal Ministry of Finance in cooperation with the Austrian Federal Computer Center. The portal "Help.gv.at" of the e-government is a nationwide platform and place where all public authorities of Austria are concentrated in the Internet to support Austrian official procedures. This portal is oriented to the needs of users and focuses on the specific situations of individual citizens, on the problems of entrepreneurs and all types of interaction with public authorities regarding these situations and events [424].

Creating centers informing citizens is an effective option to solve this problem and a real evidence of future for decentralized local governments. This demonstrates the ability of municipal officials to carry out the new duties provided by the municipal government policy for decentralization. These centers have become one of the most successful instruments for involvement of citizens in the management of public affairs.

The initiative "Bundonline 2005" [409] requires the Federal Government to provide all possible services of the Federal Administration online. The federal government opened its service portal (www.bund.de) in Hannover in 2001, it contains links to all federal agencies, providing a wide range of services to citizens, including e-procurement and employment opportunities. For example, Bavaria, Rhineland-Palatinate and Berlin, Bremen, Hamburg presented their portals containing electronic markets. Also in these cities, electronic channels providing services to citizens were opened. For example, Mannheim drafted a "civil account" procedure standard with access. Esslingen tested the election process online, Nuremberg tried the work of smart cards and Hagen presented the project of a "virtual" town hall.

The development of communication technologies has led to the emergence of new concepts, such as e-government, mobile government, omnipresent (everywhere) government and others (Table 24).

Table 24

The concepts of the information society era

Concept name	Description
e-government	The concept of creating an open, comfortable, transparent and uncostly interaction between government and citizens (G2C), government and businesses (G2B), government and departments (G2G)
e-governance	The concept of electronic authority within the meaning broader than e-government. It reveals and features the impact on socio-economic processes based on the use of information and communication technologies
m-government (mobile government)	Using mobile devices, gadgets, smartphones, providing mobile access to the portal and e-government
u-government (ubiquitous government)	The idea of ubiquitous government is based on the technological capabilities of network access for every citizen. Broadband technol-ogies create the potential of ubiquitous government
u-city (ubiquitous city)	The "ubiquitous city" allows us to develop the tourism industry in the country on the basis of modern communication technologies and a comprehensive shortcut. A "ubiquitous city" is a copy of an electron with the possibility of a virtual city life
u-society (ubiquitous society)	Ubiquitous society has the following characteristics: a friendly government, intelligent land economy, recovering (regenerative economy), safe social space (safe and secure social environment), equipped simple service that provides ubiquitous life (tailored u-life service)
t-government (television e-government)	Advances in technology and the emergence of intelligent TV (smart-TV) make it possible to make the process of interaction between the state, citizens and business in the telecommunications regime

Government portals do not only offer information about state agencies, but provide some actions for the population to attend public institutions. The e-government can support multiple partitions simultaneously, such as business activity, defense, education, employment, health, housing, law and order. Every state institution must maintain their sector.

The idea of authority and e-government has an international status, as evidenced by the initiatives of the UN. Thus, the UN Department of Economic

and Social Affairs (UNDESA) publishes a report (UN E-Government Survey) every two years. It contains a comparative evaluation of global development of e-government in 193 countries, including indicators, strategies, tools of implementation; best practices are also described. The key findings and trends in e-governance were presented at the webinar in 2012; they offered to move towards greater innovation, consolidation of state regulation of e-strategies and development of science-based policies that will promote the adoption of new technologies and respond effectively to emerging needs of citizens [430].

In Ukraine, different areas have different experience in implementing elements of e-governance. The international rating of e-government development in 2012 positioned Ukraine in the 68th place among 190 countries. The performance indexes of e-government in 2012 are presented in Table 25.

Table 25

Ukraine's e-Government Development Index, 2012 [432]

Index	The value of the index		The meaning of the index
	Ukraine	The world average	
1	2	3	4
E-government index	0.565	0.496	The current state of e-government of UN Member States; the comprehensive index of capacity and willingness to use e-government in the field of information and communication technologies
Infrastructure index	0.354	0.326	A composite index of six major indexes based on basic infrastructural indicators that define the ICT infrastructure potential. These include: PC / 1 000; Internet users / 1 000; telephone lines / 1 000; online-connected population; mobile telephony / 1 000, as well as TV / 1 000
E-participation index	0.158	0.268	The quality and usefulness of the information and services provided by the country to involve citizens in public policy through the use of e-government programs

Table 25 (the end)

1	2	3	4
Online service index	0.425	0.440	Based on a four-phased model that gradually evolves and is built on the previous difficulty in the Internet presence state: initial presence; strengthening presence; transactional presence; connected presence
Human capital index	0.918	0.721	Based on the education index UNDP which is a set of adult literacy and combined primary, secondary and tertiary gross ratio reach: two-thirds weight is given to the literacy of adults and one third is the gross enrollment ratio

Some components of the indexes of Ukraine even exceed the global average values, thus the human capital index is 0.197 higher than the average in the world: the e-government and infrastructure indexes, are 0.069 and 0.028 higher respectively. The areas of participation and implementation of e-government online services require development as the values of their indexes lag behind the world average.

To enhance the citizens' participation in the formation of civil society in Ukraine, an initiative project portal "Electronic Ukraine" was started which has the idea to form an opportunity for citizens to submit proposals to those legislative acts that have been made by people's deputies of Ukraine, and that have been registered by the Verkhovna Rada of Ukraine. For practical implementation of public initiatives the portal contained a page entitled "Writing the law together" where visitors could express their proposals to improve all areas of the political and socio-economic life in our country. According to the authors of the project, "this project is a practical tool that combines the capabilities of advanced information technologies, the will of the Ukrainian people and the efforts of politicians. It provides taking into account the opinion of every citizen in the development and adoption of not only laws, but also management decisions at the state and local levels". But today it is only advertised for viewing.

Today, the only Web portal of the executive bodies which is central in the design of the system "Electronic Government" also continues to perform the presentation and analytical function, while an integrated system providing administrative services online has not been implemented so far.

Positive development is the introduction of information services on the web portal "Public Procurement". This portal offers advertising opportunities on the Internet and ordering information services on public procurement, in particular, rapid informing and formation of archival extracts on public procurement for participants and forming a separate summary of information on procurement procedures in the form of extracts from the register of public procurement for customers.

Today, an electronic system of inquiries of individuals and legal entities is being actively introduced in Ukraine. Pursuant to measures aiming to create a web portal to provide public electronic services according to the schedule of reforms in 2011 in the direction of "Development of science, technology and innovation sphere" of the Program of Economic Reforms for 2010 – 2014, in the first quarter of 2011 the State Agency for Information and Science of Ukraine together with the State Enterprise "The State Center for Information Resources of Ukraine" has developed and implemented the first nationwide automated system of work with electronic enquiries of citizens – a web-portal, which provides a possibility for citizens to address executive authorities in the electronic form.

Full-scale operation of the web resource will help improve the quality and transparency of the processing of applications in government, simplify the procedure for filing a request and getting a response to it with the results considering the request, provide the popularization of e-government technologies.

The Cabinet of Ministers of Ukraine passed its order dated June 9, 2011 No. 589 concerning the concept of the creation of the National System of processing enquiries to authorities of Ukraine, which provides for the introduction of the automated processing of enquiries that will come through the Internet. The list of administrative services provided with the use of the Internet in Ukraine is given in Table 26.

Table 26

Services provided by state authorities

Service	Institution
Processing tax returns, electronic use of the digital signature	The State Tax Administration of Ukraine
Electronic public reception, electronic address to a state authority	The National Agency of Ukraine for Civil Service
Government procurement	The Ministry of Ecology, the Ministry of Emergencies, the Ministry of Economy
E-forms	The Ministry of Economy, the State Service for Financial Monitoring of Ukraine, the State Committee for Television and Radio Broadcasting of Ukraine
Registration of new vehicles	The State Traffic Inspectorate
The order of using an international passport	The Ministry of International Affairs
Bill payment	Partner banks

Along with the positive changes in the improvement of the system of administrative services with the use of the Internet, a number of problems remain:

imperfection of the legal framework in the field of telecommunications, the use of Internet technologies, creating and using electronic information resources, information security and information protection;

lack of coordination between state authorities and bodies of the public and private sectors for effective use of available resources;

insufficient provision of public authorities with information and the Internet;

low level of computer literacy and awareness of the available resources of e-governance;

slow implementation of e-business technologies, electronic exchanges and auctions, electronic depositories, use of cashless payments for goods and services;

lack of integrated national information resources;

lack of common formats and protocols of digital signature;

slow creation of a national information infrastructure aiming to provide businesses and individuals with information services using the Internet by public authorities and local governments;

low level of informational representation of Ukraine in the Internet space, lack of online Ukrainian information resources;

insufficient involvement of the scientific community, business and civil society organizations in the processes of informatization of the country, building the information society;

deepening "digital divide" between different regions, economic sectors and various segments of the population.

Further development of an effective system of administrative services with the use of the Internet implies the following steps:

clear definition of the strategy of the authorities with provision of electronic services as a priority goal;

provision of state support for growth of new electronic sectors (trade, public services and banking services);

ensuring the establishment of national information systems, primarily in the areas of health, education, science, culture and environmental protection;

integrating the available electronic systems of government in a system that communicates, operates on a single regulation and is controlled by one executive body;

providing services to citizens and businesses electronically on a "single window" basis;

ensuring the improvement of administrative processes in government using ICT;

accelerating the creation of the information infrastructure of e-governance;

making a list of administrative services provided by public authorities via the Internet;

developing the criteria for assessing the quality of administrative services and establishing service standards.

Thus, it should be noted that despite the fact that the state of development of the system of electronic services rendered by public authorities in Ukraine is inadequate and does not meet the capacity and capabilities of the country compared with global trends, today in Ukraine, there has been developed an integrated approach to the implementation of the systems of administrative services via the Internet, as evidenced by the approval of the Concept of E-government in Ukraine and the Concept of the National System of Processing Enquiries to State Authorities, that have become strategic documents for the formation of e-democracy.

The results of the pilot survey [330; 419] showed that the idea of using the Internet by citizens of Ukraine for interaction with public authorities and local self-government is practicable; the most popular area of the use of e-government by citizens regardless of the age and status is complaints and enquiries to state and local authorities.

The main causes of the sceptical perception of the idea of e-government, as revealed by the supplementary interviews, were the following: 1) lack of confidence in the reliability and efficiency of the system, 2) the impossibility of direct communication, and 3) the problem of access to the Internet.

The above problems should be resolved at the legislative level. The National Action Plan for 2011 to implement the program of economic reforms for 2010 – 2014 "Prosperous Society, Competitive Economy, Effective State", approved by the Decree of the President of Ukraine of April, 27, 2011 No. 504/2011 under the section "Ensuring the development of people-centered, open and development-oriented information society" provides the basic task of building the backbone elements of the system "e-government". Analysis of the legislative acts that regulate the creation of e-government, showed that there are some problems to be solved.

Analysis of publications and legislation on e-government revealed that the main problems associated with the introduction of e-government are in such areas as law, economics, psychology, social and cultural processes.

Thus, the developers of the Concept [392] pointed to a number of unresolved issues that hinder the creation of a valuable electronic government in Ukraine. According to the authors, most of them are still pressing, in particular:

e-government tasks should not be only automation of existing processes, but also making more effective social and economic decisions through self-learning of e-government portal users;

the lack of implementation of a national system of indicators (parameters) evaluating the state of e-government. One of the basic principles of assessment should be the development of criteria for the quality of public e-services; the time spent, the number of cases, user satisfaction should be the criteria;

the need for improvement of uniform standards and regulations of the system of electronic document circulation with electronic digital signature, and driving state information resources, adapted to international standards;

limited access of citizens and businesses to the information resources of the state caused by legal, technical and socio-psychological factors;

no single universal enough integrated system of national information resources and information interaction of state and local governments, a system that would have the potential for combining with other information systems with the aim of international integration;

the need for expansion of the regulatory and methodological framework to ensure effective functioning in the information society, namely, poor legislative regulation of rendering administrative services and citizens' and e-commerce representatives' enquiries to government agencies and local governments through network systems and the Internet;

the need for the creation of local information and communication centers at all levels of the state to ensure the availability of public communication and information services.

It is necessary to draw attention to the fact that the information itself, no matter how well its progress through certain systems is organized, cannot change the behavior and organize activities. Therefore, the human factor is of special importance in this process, because the information is aimed at a human and the goal is not only to inform, but stimulate, motivate action, activity, ideas and solutions. Thus, the modern system of state regulation of social and economic processes features peculiarities of the socio-psychological processes of perception, understanding and processing of information; it is not just for in-house communication, but in any case aimed at the public. One should take into account the fact that in the context of communication, government regulation is a direct tool of civil society. It is clear that the essence of e-government as a form of modern government regulation is reduced to ensuring speed, transparency, openness and quality of public authorities, decreasing bureaucracy and incompetence.

The centers of informing citizens as a form of e-governance is an effective approach of authorities to the formation of harmonious relations with citizens who are not only taxpayers but also competent participants in the socio-economic and legal processes in the country.

The consequences of the introduction of e-government should be a high quality of public authorities and local governments, saving time and material resources, improving the quality of state regulation of all spheres of national economy.

Chapter 8
A complex approach to the development of the sphere of communication activity

From the standpoint of the problem of development of communication activities, the control of the communication capital reproduction is an important area. Thus, the mechanism of formation and management of the communication capital reproduction must be presented with a list of items having a relevant targeting.

The national economy of any country is a system consisting of branches or individual operating areas of the economy. Thus, the study of the development trends in communication activities should be based on a systems approach, since the focus of attention is not so much a short-time forecasting but conclusions on the possible development of each element of the communication areas in the medium term. In this case the apparatus of the trend growth models satisfies the study goals.

Forecasting economic performance based on the time series trend model classify as a univariate forecasting technique based on extrapolation (i.e. the continuation of the future trends observed in the past). In the case of trend growth models, variation of the studied parameters is not connected with specific factors, but with the time, which is manifested in the formation of one-dimensional time series. The algorithm of forecast development using the trend growth models involves the following steps: a) the choice of one or more growth curves whose shape corresponds to the nature of the dynamics of the time series; b) estimates of the chosen growth curve parameters; c) check of the adequacy of the selected growth curve; d) calculation of forecasts on its basis in the case of the adequacy of the selected growth curve.

Currently, there are a large number of types of growth curves for the economic process. To properly pick the best growth curve of modeling and forecasting economic phenomena, it is necessary to know the features of each type of curves. Generally, there are three types: 1) functions with a monotonic character of trends (these are polynomial curves); 2) saturation curves with a limit of growth; 3) S-shaped growth curves (the Gompertz curve

and the logistic curve). To select a particular growth curve for modeling the dynamics of the economic process, one should not only use the actual results of visual analysis of time series, but also theoretical considerations as to the features of changes in the studied economic indicators.

The results of the analysis of the prospects of development of communication systems using the trend growth models are presented in Table 27. Spot forecasted revenue values for each type of communication are presented in Table 28. The following activities can be attributed to those that are developing rapidly and whose proceeds will grow in the short and medium term: transmission and reception of television programs, computer communication, courier activities. The types of communication with the anticipated accelerating pace of revenue decrease in the medium term are the following: telegraphic communication, long distance telephony (including international). The types of communication for which one can expect, in the short term, only minor fluctuations in the value of the annual revenue as achieved in 2012 are the following: postal services, mobile communications. The continued existence of the latter two forms of communication may be associated with the use of new technologies in these fields and communication standards that should result in new trajectories of development of appropriate areas.

Table 27

Conclusions regarding the development of communication models based on the trend growth

Type of communication	Product revenue growth curve of this type of communication	The estimated trend growth model	Conclusion as to the medium-term development prospects
Postal	S-shaped Gompertz curve	$\hat{y}_t = 5\,000 \cdot e^{-7.8 \cdot 10^{146} e^{-0.1685 t}}$, where $t = \overline{2002, 2012}$	The trajectory of income entered the phase of a slowing growth rate. In the medium term a slight increase is expected. In the long term variations at the maximum level can be observed
Telegraph	Logarithmic parabola	$y_t = 28.54 \cdot 1.26^t \cdot 0.98^{t^2}$, where $t = \overline{1.11}$	Reduced income at an increasing pace until reaching a close to zero value by 2027
Long-distance telephone	Logarithmic parabola	$y_t = 3\,562.94 \cdot 1.24^t \cdot 0.98^{t^2}$, where $t = \overline{1.11}$	Reduced income at an increasing pace until reaching a close to zero value by 2027
Transmission and reception of TV and radio programs	S-shaped Gompertz curve	$y_t = 12\,800 \cdot e^{-1.13 \cdot 10^{75} e^{-0.09 t}}$, where $t = \overline{2002, 2012}$	The yield curve is in the phase of an intensive growth rate. Earnings growth is expected in the short term. The development of TV industry is ensured
Computer	S-shaped Gompertz curve	$y_t = 20\,400 \cdot e^{-1.02 \cdot 10^{98} e^{-0.11 t}}$, where $t = \overline{2002, 2012}$	Further development of computer communication is expected in the short and medium term. The yield curve entered the logarithmic phase of an intense growth rate
Mobile	S-shaped curve of Gomperz	$\hat{y}_t = 34\,500 \cdot e^{-1.7 \cdot 10^{304} e^{-0.3495 t}}$, where $t = \overline{2002, 2012}$	The trajectory of the revenue entered the plateau phase. In the short term the annual value will show almost no change. Fluctuations are possible around the limit level achieved. In the medium term a new trajectory of growth can be expected due to the introduction of new mobile communication standards
Courier activities	Linear increase	$\hat{y}_t = 28.25t - 56\,463$, where $t = \overline{2002, 2012}$	A linear increase of revenues in the short term

Table 28

Spot forecasted revenue values of post and other communication modes built on the basis of trend models

Type of communication	Product revenue growth curve of this type of communication	Spot forecast annual revenue in 2013, mln UAH	Spot forecast annual revenue in 2014, mln UAH
Postal	S-shaped Gompertz curve	3 505	3 704
Telegraph	Logarithmic parabola	28	22
Long-distance telephone	Logarithmic parabola	2 097	1 516
Transmission and reception of TV and radio programs	S-shaped Gompertz curve	2 896	3 272
Computer	S-shaped Gompertz curve	6 228	7 062
Mobile	S-shaped Gompertz curve	32 834	33 317
Courier activities	Linear increase	404	432

Communication assets as well as communication investments are dominant assets of service providers in the field of public information networks and information and communication technologies. Communication capital as permanent assets is designed to create and enhance socially available business services of radio communication and information networks.

In turn, the communication capital provided the classical interpretation of capital advanced as cost is advanced cost of communications that bring income. Communication (as defined above) is the activity, dynamical system of human interaction with reality in order to meet needs resulting in the creation of a single socio-economic area, while maintaining the individuality of each element. Communication is realized through the use of communication products.

It should be noted that in the previous chapter the author hypothesized that a communication product has two interrelated components: the material and nonmaterial ones, providing communication activities, namely the interaction to meet the needs and create a single socio-economic space.

To confirm this hypothesis, let's analyze the presence of a probability connection between the communication means and the income from providing an appropriate type of communication. To test the hypothesis for a close linear relationship between communications and the revenue from this type of communication the following pairs "means of communication – income" were chosen:

(A) the availability of personal computers in households – income from computer network;

(B) the availability of mobile phones in the household – revenues from mobile services;

(C) the number of long-distance payphones – revenues from long-distance telephone services.

Using the information provided by the State Statistics Committee of Ukraine on the program HBS as well as the official data on incomes of transport and communications, the correlation coefficients between the rows of data presented in Table 29 were calculated.

Table 29

Calculation of the correlation coefficients between the rows of data "means of communication – income from this type of communication"

Type of communication	Year	Indicators of communication means	Source of income
Computer	Year	The availability of personal computers, an average of 100 households	Providing computer communication services
	2003	4	643
	2004	6	935
	2005	9	1 009
	2006	12	1 256
	2008	22	2 416
	2010	25	4 237
	2012	33	643
	The correlation coefficient $r_a = 0.95$		
Mobile phone	Year	The availability of mobile phones, an average of 100 households	Mobile communication services
	2004	15	9 483
	2005	44	14 476
	2006	81	20 056
	2008	149	29 630
	2010	167	28 835
	2012	187	31 554
	The correlation coefficient $r_b = 0.97$		
Long-distance telephone (including international)	Year	The number of long-distance payphones (100 thousand people)	The provision of long-distance telephony services
	2000	43	2 824
	2003	102	4 637
	2004	110	6 033
	2005	123	6 624
	2006	120	6 184
	2007	102	5 879
	2008	90	5 511
	2009	68	4 656
	2010	60	3 962
	2011	50	3 482
	2012	22	3 019
	The correlation coefficient $r_c = 0.99$		

All the correlation coefficients between the data about availability of a communication means and the income from this type of communication service exceed 0.95 (Table 29), which indicates a very strong linear relationship between the studied rows of data. The significance of the correlation coefficients can be checked using the statistical Student's t-test:

$$t_{emp} = \frac{r \cdot \sqrt{n-1}}{(1-r^2)}, \quad (1)$$

where

r is the correlation coefficient obtained, the significance of which is checked;

n is the length of time series.

The coefficient can be considered statistically significant by Student's t-test, if the condition where $t_{emp} > t_{crit}$ is fulfilled, where t_{crit} is the Student's t-criterion tabulated value for the selected level of significance. The obtained correlation coefficients are significant with a 99 % level of confidence (Table 30), so the hypothesis of the close linear relationship between the communication means and the income from this type of communication is recognized fair.

Table 30

Checking the significance of the obtained correlation coefficients

The correlation coefficient r_a	The correlation coefficient r_b	The correlation coefficient r_c
$t_{emp}(r_a) = 29$	$t_{emp}(r_a) = 35$	$t_{emp}(r_a) = 109$
$c = 3.17$	$t_{crit} = 3.70$	$t_{crit} = 4.03$
significant	significant	significant

Thus, the material component of the communication product (availability of means of communication) is closely linked with the intangible element (income from a certain type of communication service); in turn, communication capital can be evaluated through the intangible component of the communication product, evaluated by the expert methods and the material component measured by the methods of economic analysis.

Speaking about the close relationship between the material and immaterial components of communication products, one should note that the cost of equipment for communication processes began to increase in almost

all industries. Thus, according to Gartner [416], buying smartphones and tablets significantly exceeds the volume of buying PCs; in the second quarter of 2013 they rose by 46.5 %. According to Gartner, spending on mobile devices (laptops, mobile phones, tablets and ultrabooks) in EMEA (Europe, Middle East and Africa) will be $188 billion in 2016 – 2017.

Productivity of communication capital is measured by the number of communications established over time. Productivity of communication capital embodied in communications products invested in communication networks is described by the network use intensity and the intangible effect reflected in the communications network and communications products performance data. However the author notes that measuring the value of communication capital and communications product is not stipulated in the system of bookkeeping and tax accounting.

To improve public regulation of the communication sector development of the economy, the statistical reporting practices should be developed in order to collect information about communication capital for the evaluation of the equity structure in the total gross profit and the structure of investment. The structural elements of measuring the performance of communication capital are shown in Fig. 10.

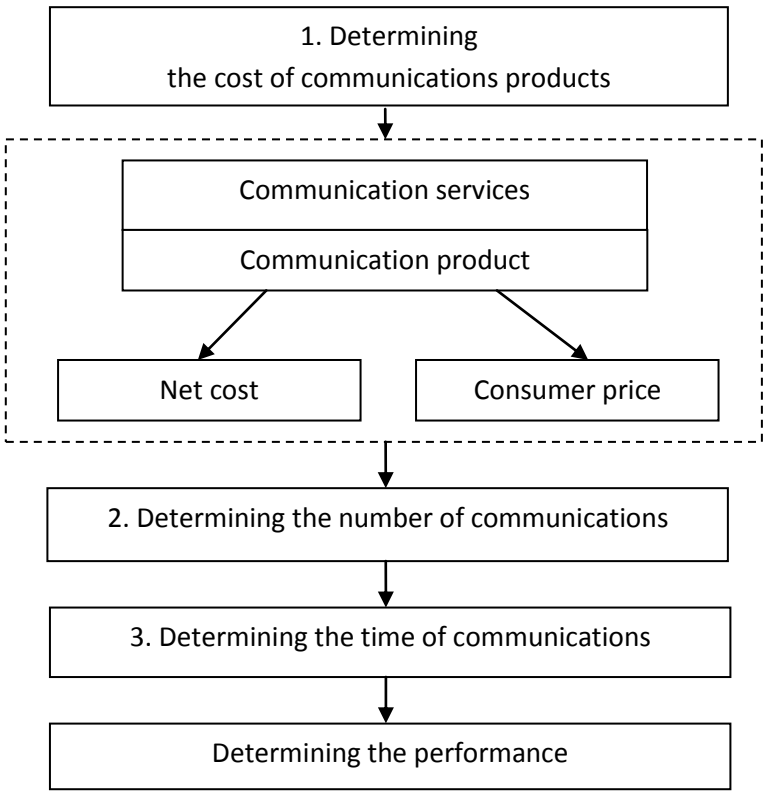

Fig. 10. **The scheme of determining the communication capital performance**

One of the measures of the effectiveness of an economic entity is the acceleration of the working capital turnover which can be achieved by improving the communication capital performance. Communication capital productivity growth is predetermined by the saved time and money spent on the act of communication that directly affect the efficiency of the core production, because, firstly, production costs associated with the duration of the production cycle are reduced, secondly, the need for a greater number of communications per unit of time is satisfied.

Regulation and performance evaluation in the field of ICT is accompanied by problems of performance evaluation in nonmaterial production. Firstly, resource elements of the information and communication services is determined. For example, the operator can simultaneously offer customers several different services (calls, transfer of images, access to the Internet, receiving messages). Services are usually provided in a complex and it is difficult to separate them because they are offered as a package. The package, in turn, has a certain value.

Secondly, the intangible nature of ICT defines the tasks of fixing the fact of rendering the service, because after the service has been provided there is usually no material evidence of it as such (products in physical form). For example, users' access (connection) to the Internet can be considered as a fact of rendering a service. But each product basically has an unsatisfied need. The existence of a satisfied customer need for communication systems, for which they connected to the Internet, is a repetition of pay, contract extension.

Thirdly, it is important to take into account the role of the consumer. Consumers are involved in the process of creation and delivery of a service. Consumer participation also creates problems with the assessment of the performance in communications.

Thus, with a number of information and telecommunication services customers themselves are engaged in the delivery of services, purchasing the necessary communication devices. Consumer effort is usually not taken into account in the labour contribution of the company that provides telecommunication services, and this causes biased assessment of the labor input of the producer of services and overvaluation of the performance.

Therefore, it becomes difficult to separate the consumer contribution from the contribution of the manufacturer. One can assert that, because consumers do part of the work (for example installation and setup of communication devices), the price of the services in practice is lower than should have been. On the other hand, inexperienced consumers can adversely affect the quality of telecommunication services.

In turn, the performance of the service may depend on the number of customers served. For example, the output of TV companies can be estimated as the number of viewers, in turn, several or no TV viewers may watch one TV set.

Volatility of the demand for a number of services is a separate problem. It is difficult to predict, but the company that provides telecommunication services must support the means of the service and always have available staff. For example, the intensity of calls to the subscriber support service differs from day to day, but the number of consultants is permanent. Thus, the personnel costs of unproductive days must somehow be taken into account in the overall performance.

The intangible nature of information and communication services causes difficulty in assessing both its quality and communication capital performance. For example, information services are usually estimated as the number of hours allocated for a separate case. However the result of this service – whether the information is comprehensive, complete and reliable – depends on the quality of information, but not on the amount of time spent by the consumer. In addition, consumers cannot properly evaluate the quality of the information because they are not competent, that is, have no special knowledge. This fact, together with the fact that many services require pre-payment, can lead to a reassessment of the performance of service because poor service quality is part of the overall result. Also, the quality of the results for information and communication capital may depend on the consumer and their behavior.

As a basis for the evaluation of the communication capital performance, the author uses Robert Metcalfe's law (Metcalfe's law) [411]. Metcalfe's law says that the utility of networks (in respect to Ethernet) is approximately equal to half the square of the number of network users ($n^2/2$).

It is assumed that communication takes place between the two parties. In this situation triple and other multilink connections, such as television or web conferences are not taken into account.

The law got its name in 1993 due to George Gilder. He claimed the importance of this pattern for the development of a so-called "New Economy" [417]. Next, Reed E. Hundt, chairman of the Federal Communications Commission in the US, said Metcalfe's law "gives us the best basis for understanding the Internet" [414]. A few years later Marc Andreessen, the founder of the first popular Web browser, connected rapid development of Web, for example, the AOL narrative framework with the Rule of Metcalfe's law.

The law describes the concept of the network effect and can be used in social networks, in network marketing. The network effect is the effect that the user of a product or service finds as the value of the product or service to others. The more users own the means of communication (phones, smartphones, ipads, radios, pagers), the more valuable the network usage of each user. The value increases with the increasing number of owners of the means of communication, because the connection of each additional user means being able to connect with a large number of others. This is an example of a positive effect, as the user can acquire a means of communication without the intention to create value for users, but connecting to the communications platform or network, inadvertently creates it. However, network effects may be negative, such as network congestion or congestion in the traffic.

Network effects were a central theme in the works of Theodore Vail [434], on the subject of the monopoly on telephone services. In 1908, when he introduced the concept in the annual report of Bell, there were about 4,000 local and regional exchanges, which eventually were merged into a single company Bell System. Metcalfe argued that the number of Ethernet cards must reach a certain critical mass of users to feel all the advantages of the network. In assessing the technology he proposed to use: the cost of cards sold directly proportional to their number N; the value of the created network to be directly proportional to the square of the number of users N^2.

The network effect is significant after a certain number of product or service users has been achieved (an extreme value), called a critical mass. At this point the value derived from using the product or service is greater than or equal to the price paid. Since the value is determined by the number of users, attracting customers after reaching a critical mass becomes a much easier task. New users will perceive the value of the service or product through positive network benefit rather than its actual cost. A key challenge for businesses operating in the market with the availability of communications network effects is to attract visitors to reach their critical mass.

In many networks users are homogeneous, i.e. they perform the same functions. Examples of unilateral networks are: instant messaging, fax, e-mail. However, the communication process always involves two subjects, and therefore bilateral communication networks, i.e. network markets that have two user groups with the emergence of network effects between them, appear and develop. In the two-way network for two categories of users, the goal of using the network and their role in the network are quite different. Representatives of different groups have different requirements for the functionality of the bilateral networks. But they are interdependent, and it is their interaction that determines the value and use of a common network.

As part of the national economy, consumers of communication services and products form the economic welfare of the country.

Interaction of user categories is effected through a single common platform, single communication and information space – a communication complex, which provides for such communication interaction. A communication complex is made up of institutions, communication products and services that combine the two user groups. The communication complex has a certain set of rules defining the conditions of transactions, the rights and duties of its users, the infrastructure (hardware and software), standards that ensure interoperability between the elements of the infrastructure.

Using the communication complex is economically feasible. Its existence improves the efficiency and effectiveness of communication compared to direct interaction bypassing the platform. In the two-way network, a cross network effect manifests itself which means that one category users change attitudes to the use of the network depending on the number of users of other

categories. In terms of one-sided network effect every member of the group of users also changes attitudes towards its use depending on the number of users of the same category.

The efficiency of the capital communication of a single communication space must pass some stages: the period of the creation of production capacity, during which productivity of capital falls; the time when the efficiency increases due to the increased number of users and the intensification of the use of the network, even if the equipment costs continue to increase. In terms of both the consumer and the provider, the network quality will depend on the balance of the network power networks and the real traffic. Nevertheless, according to Metcalfe' law, the revenue from the network increase is directly preconditioned by obtaining the benefits from the use of the installed equipment. Increased capacity utilization is an indication that the effect of the network use is possible without growth of concommitant costs of increase in the communication capital. Capital productivity is a manifestation of efficiency, according to which network services are delivered and can be considered as a given index based on the data of the real volume of services provided and the number of communications capital investments. Combining information networks and the subsequent monitoring of the efficiency of capital and the results of the joint use of communication capital show income falling for some time followed by their growth, together with increasing intensity. Thus, there is a problem of optimization, harmonization of situations of zoomed networks (due to the number of users) or increase of innovation in terms of strategic development.

Capital as a whole is the sum of working capital, fixed assets, intangible assets. The efficient use of capital is best characterized by its profitability. The level of return on equity is measured by the percentage of profit to equity.

The reserves of capital efficiency are: an increase in sales and profits from sales, restoring the active part of fixed assets and intangible assets, improved use of equipment in time and productivity.

The mechanisms that explain and reduce long-term total costs and their increase, are described by the manufacturing function. Assume that the network effect under Metcalfe' law appears in two values: 1) the trend in the network communication capital productivity; 2) the use of the communication

capital, such as the network. These variables can be described by classical dependence of productivity, i.e. the number of communications per unit time.

The efficiency of productivity is measured by the index "return". Otherwise efficiency is a change in the profitability associated with changes in capital ΔC.

Let R1 is return on K1 and R2 is return on DO2, then

$\Delta R = P2 - P1$; $\Delta K = DO2 - K1$; $\Delta D = D2 - D1$,

where

D1, D2 is income;

K1, DO2 is capital;

$\Delta R = \Delta D/\Delta K$ is change in profitability.

$P = D/K$,

therefore,

1) $\Delta R = \Delta (D/K)$, where $\Delta R = (D/K) = (D + \Delta D)/(K + \Delta K) - D/K =$

$= D/K + \Delta D/TO - D/DO2\ \Delta K - D/\Delta D = TO/TO - D/K\ \Delta K/K$;

2) $\Delta R/\Delta K = (\Delta D/TO - D/K \cdot \Delta K/K)/\Delta K = \Delta D/\Delta K \cdot 1/TO - D/K \cdot 1/K =$

$= 1/K\ (\Delta D/\Delta K - D/K)$.

Understanding the functioning of agents on the market of communication technology allows us to formulate a number of statements. If all products are mutually compatible, there is only one equilibrium that is symmetric. Symmetric balance for N operating firms only exists when the output V (A/N) ≥ A/N. For any N ≤ N + 1 under conditions of active symmetric equilibrium for N operating firms there is symmetric equilibrium (N +1) for active agents. The level of production with the industry-wide component is higher than any balance for below full compatibility. If two groups of agents make their communication products (produce a communication service) and merge, provided that industry-wide output by merger is less than A, then in any balance after merger: the average output in the groups of agents that merge will grow; the output of each of the firms that are not included in the groups that merge reduces; the industry output will grow. If the costs of merging are permanent, any change aimed at achieving full compatibility, increasing industry-wide income, is socially profitable. Even if any payments between any agents are possible, agents that maximize profits cannot achieve full

compatibility of products if full compatibility is socially optimal. When permanence of costs is inaccessible, limiting the possibility of private standardization is difficult. That is why there is a growing number of cases where agents do not achieve a socially beneficial standard. It remains true that any industry standard paying for agents is desired. If growth of compatibility does not lead to industry-wide compatibility, the private incentives that induce standardization may be excessive. Suppose there are only two agents on the market. If the market balance is not symmetrical and there are no side payments, then the share of production incentives for the adapter is too weak.

Based on this ratio, the performance assessment of the impact of communication on the activities of economic agents (e.g. organization) can be divided into four levels:

1) the level of rational expectations of communication subjects;

2) the level of emotional expectations of communication subjects;

3) the level of emotional impact on communication subjects in the interaction;

4) the level of frequency of interaction among the subjects of communication and management.

To determine the assessment of the communication impact effectiveness on the agent (firm) activities, relative indicators were taken. The reference value for each indicator of the level of impact will equal a unity, but the formula proposed below have a certain level of uncertainty. The latter arise because measurement of communication activity is a task in which there is no definitive formal criteria for determining the efficiency of communication, i.e. in the literature and in practice no reference criteria are set for determining the effectiveness. Thus, N. M. Dragomiretskaya similarly sets the problem in her studies. She offers to take into account emotional expectations as a variable in calculations, but it does not offer ways to define them [44]. We believe that it is necessary to separate the emotional and rational expectations, separately consider the time factor and the semantic load.

Therefore, to assess the effectiveness of the communication capital performance, the author offers to base the assessment on the ratio of expectations to the results of communication activities. And expectations

should be formalized as a goal tree and emotional expectations should be separated from the rational ones.

$$Ef = \frac{E_r}{R_r}, \quad (2)$$

where

Ef (effectiveness) is the level of achieving the ultimate goal;

E_r (expectation) is the expected result of business communications;

R_r (result) is what actually, really, particularly the object of communication activities received.

Another indicator characterizes meeting the information needs resulting from communication.

$$Ef = \frac{I_p}{I_n}, \quad (3)$$

where

Ef (effectiveness) is the level of satisfaction of information needs as a result of communication;

I_p (information presented) is the information that is provided;

I_n (information needed) is the information that is needed.

$$Ef = \frac{Q_i}{T}, \quad (4)$$

where

Ef (effectiveness) is the level of meeting the needs of communication;

Q_i (information quantity) is the amount of information received or produced);

T (time) is the time period spent for obtaining and making information.

The effectiveness of communication activities can also be evaluated on the basis of comparison of the values received with the reference values.

These figures projectively show the effectiveness of subjects of communication. Thus, in formula (2) the numerator is the indicator of expectations and the denominator is the result of activities of management. The reference value is the unit. So, in order to determine the mode of the subject of

communication one can analyze their actions and compare them with the results for each act of behavior and so on.

A phase of the communication activities is considered as a percentage of completing a task, solving a problem and so on. Let's assume that for assessing the level of expectation in the percent of impact one can take two parameters: a regulatory term of tackling a problem and the actual term of tackling it. These indicators can be determined by the regulating documents, programs and independently established terms of solving problems by management subjects.

So, as a result of the study of theoretical and methodological principles of research on the productivity of the communication capital, the author has improved and developed the theoretical approaches to determining the communication capital productivity in the national aspect. The author's proposal is based on resolving the contradiction which is as follows: active dissemination of information and communication technologies and the amount of information on the one hand, and the need for concentration on certain information products to manage socio-economic development on the other hand; virtualization of information products and their detachment from reality on the one hand, and social responsibility to consumers and users of communications networks in the production of information products which are the factors that make communication capital on the other hand.

The afterword

The findings of the monograph research on state regulation in the sphere of the communication economy, which are highlighted in the monograph, show the relevance, importance and necessity for timely and well-considered decisions made by authorities not only in the management of the sphere of communication activities as a branch, but also in the development and implementation of targeted comprehensive programs and strategies aimed at both raising living standards of the population and achieving the positive effect in the socioeconomic development of Ukraine.

The obtained scientific results make it possible to solve the complex problem of the state regulation in the sphere of communication activities within the framework of the information society and constitute the single comprehensive theoretical and methodological basis, which can be described by the main theses.

The era of innovations has led to the emergence of new economic conditions, namely: the increased variability of the market environment, globalization of economies and integration of social and economic processes. As a result, the preconditions for the formation and development of a new socioeconomic structure have been formed. Researchers on problems of the evolution of socioeconomic processes emphasize the emergence of the postindustrial society, knowledge economy, information economy and information society. The author has substantiated the identity of these concepts and established the list of features and characteristics of the progressive social and economic structure – the information society.

It is defined that the main characteristics of the information society are knowledge-based technologies, the creative aspect of human activities, continuous education and growth of communications. Knowledge, information and morality are determined as basic values of modern times; transnational economic associations and the university as a source of education are defined to be main institutions; the computer is deemed a symbolic production facility.

The use of the interdisciplinary method has allowed highlighting the aspects of the research into the basic category of communication. Thus, summarizing the definition of communication, the author singled out the basic semantic contents in static, dynamic and qualitative aspects. That is, communication in the static system equates to the categories "message", "linking", "intercommunication", "network", "reporting system", "exchange", "meeting"; in dynamics – "combination", "interaction", "transmission", "community achievement", "exchange", "intercommunication"; in quality – "dynamism", "sociality", "information capacity", "content richness", "symbolism", "subjectivity" and "reflexivity".

The essence of the above characteristics determines the meaningful contour of the complex concept of the state regulation in the sphere of

communication activities and reveals the communication component of the notion "communication activities". The monograph has highlighted the dual nature of the category "communication activities" which, on the one hand, is a type of activity, and on the other hand, an element of the categorical system of the concept of communication.

The praxeological approach emphasizes the activity aspect of communication activities and makes it possible to substantiate its need-motivational orientation. Thus, in the paper, the economic nature of the category "communication activities" is determined on the basis of the praxeological approach.

Presentation of the communication process from the standpoint of the logic of the production cycle in the economy makes it possible to develop the classification of communications and to substantiate the relevant content classification, whose classificatory features are: need (some certain need), communication (transfer, the interaction process), content (the content of the message and the object of communication), communicative and receptive (communicator(s) and recipient(s), the subject of communication). To develop this result, the author has identified the manifestation of classification signs of communications in the economy and their reflection in the legislative acts of Ukraine.

The dialectical approach to the research problem, taking into account the achievements mentioned above, points to apparent contradictions that determine the existing progress and the need for the state regulation of the further development of the sphere of communication activities in the economy. The monograph has defined the contradictions that have become the basis for the development of theoretical and methodological scientifically based proposals of the author. The contradictions in the theory of the sphere of communication activities are as follows: the effective implementation of competence-based and ethical approaches in managing dynamic socio-economic system conflicts with the adaptive and situational approaches in the management that address the issue of flexibility and adaptability to constant changes in the external environment. The contradictions in practice are, on the one hand, active dissemination of information and communication technologies and the amount of information, on the other hand – the need to

focus on certain information products in order to regulate the social and economic development; on the one hand – the virtualization of information products and their separation from reality, and on the other hand – social responsibility to consumers and users of communication networks in the production of information products, which are factors that shape the communication capital.

The communication capital has been defined as the advanced value of revenue-generating communications. The place of communications in the typology of the forms of capital has been substantiated; material (devices and means of transfer) and intangible (competence of communicants) components of the communication capital have been characterized.

The structural approach to the description of the communication capital is the basis for the justification of methodological approaches used to assess its performance. The regulation and performance evaluation in the field of ICT is accompanied by problems of determining the performance in the nonmaterial production, namely: the complexity of information and communication services, the problem of fixing the fact of their implementation, and the relevance of accounting for the role of consumers involved in the process of creation and delivery of services.

The development of the communication sphere in the market environment is based on self-organization. Therefore, on the basis of the use of synergetic paradigm in the work, the controlled innovation process has been simulated in the sphere of communication activities. Its main idea is to move from the unpredictable behavior of the economic system according to the algorithm of the dissipative structure to the directed motion along the desired trajectories – attractors. This is the method of synthesis of the socioeconomic system with the directed self-organization.

The use of the paradigm of F. Perry's growth theory and the methodology for analyzing interbranch balances has made it possible to determine priority areas for the modern development of the sphere of communication activities in the economy. The software development, online activities (e-activity), banking and finance sectors, education, TV and media entertainment, telecommunications and professional counseling are the main of them.

The conceptual bases of the state regulation for the development of communication activities in the economy within the framework of the information society and in the context of the social state development have been substantiated. The concept includes statements based on the theory and methodology, taking into account relevant principles, and implemented by certain mechanisms.

Thus, the results of the research contribute to the improvement of the processes regulating the development of communication activities. Their practical value consists in the recommendation to consider the communication complex in the system of the national economy as its separate branch as well as a subsystem in the structure of the national economic system with realization of measures related to the state stimulation of the development of the communication sphere in the nation's economy.

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НАУКОВЕ ВИДАННЯ

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СОЦІАЛЬНО-ЕКОНОМІЧНІ АСПЕКТИ КОМУНІКАЦІЙНОЇ ДІЯЛЬНОСТІ В УМОВАХ ІНФОРМАЦІЙНОЇ ЕКОНОМІКИ

Монографія

(англ. мовою)

Самостійне електронне текстове мережеве видання

Відповідальний за видання *В. М. Нагаєв*

Відповідальний редактор *М. М. Оленич*

Редактор *З. В. Зобова*

Коректор *З. В. Зобова*

Надано результати практично орієнтованого дослідження, які дозволяють вирішити комплексну проблему регулювання сфери комунікаційної діяльності в умовах інформаційного суспільства, яка характеризується, з одного боку, віртуалізацією інформаційних продуктів та відривом їх від реальності, з іншого – соціальною відповідальністю перед споживачами й користувачами комунікаційних мереж під час виробництва інформаційних продуктів, які є чинниками, що формують комунікаційний капітал та комунікаційне суспільство.

Рекомендовано для фахівців із економіки та комунікаційних наук.

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