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Mechanisms of e-Governance in Information Society

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As a result of the conducted research, a system of interrelated mechanisms for development of e-governance and e-democracy is proposed; a methodology for an innovation-oriented society is substantiated; innovative technologies and mechanisms of e-communications are provided; a methodology for regulation and delivey of e-administrative services is given grounds for; practical recommendations are provided to improve a service-oriented state infrastructure.

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INTRODUCTION

The main characteristic of an information society is creation of a global information space providing efficient information interaction of people, their access to global information resources, and satisfaction of their needs for information products and services.

Knowledge and information have become a strategic resource of the information society and the leading sector of the economy. Transforming information into a vital production resource changes the paradigm of society's evolution – the foundation of the information society is laid not by traditional material resources, but rather by information and intellectual ones: knowledge, science, organization, people's abilities, initiative, formation of structures and mechanisms of a qualitatively new social intelligence, which open new self-identity opportunities for every community.

The use of information and communication technologies (ICT) is regarded as a basis for sustainable development of virtually all elements of the social infrastructure, such as: e-administration, e-government, e-commerce, e-learning, e-science, e-healthcare, e-employment, e-environment protection, e-agriculture and others. Information technologies (IT) do not change kinds of activities, but rather their technological capacity for using new knowledge as a direct productive force.

In the present-day society, the role of technological innovations is growing rapidly, especially that of e-communications sector, which increasingly influences the modern economic system development, being a link between industrial areas, services, users, and the country's regions and economic centers. Therefore, the development of e-communications as a basic component of the information society that ensures an efficient interaction of all the social structures, including the government ones, is a pressing task of social and economic growth.

The goal of innovation in today's information society is to find new effective and fair ways of knowledge resource management. According to this goal, the program of the World Intellectual Property Organization includes exchange of experiences on open collaborative projects in the field of intellectual property, and on this basis reforms and integration of the International Patent Classification are planned to provide a free access to technological knowledge stored in patent databases (DB).

The European Union proposed innovation processes of developing e-communications in four areas:

1) promoting competition and opportunity for a national regulatory authority to introduce, where appropriate, division of functions in maintaining infrastructure and providing services;

2) improving regulation by reorganizing the retail and wholesale markets of e-communications and services: it is not necessary to regulate the retail market in case the wholesale services market is regulated effectively; while the need for regulation of the wholesale market disappears when there is a sufficient level of competition;

3) strengthening of the internal market and approximation to the European rules by coordinating regulation in the EU member states;

4) developing consumer protection by extending the rights of communication e-services consumers; making pricing information accessible; facilitating customer transfer from one service provider to another; providing access to e-communications services for people with disabilities; imposing a duty for operators to inform their customers of the risk of personal data disclosure; fighting spam, spyware etc.

The concept of e-government involves creation of a government that combines organizational innovation in ICT for basic government functions in a constantly changing environment. In this concept, functions of the government underlie the basic dimensions (components) of e-government: e-administration covers most of administrative and operational processes of the government; e-services imply provision of public (administrative) services to citizens and businesses; e-governance is understood in the public context; e-democracy is characterized by democratic structures, processes and methods, where ICT are used to increase transparency, democratic decision-making, inclusion and participation of citizens.

In a situation when bureaucratic procedures themselves are ineffective, their transfer to the Internet space is unlikely to improve the efficiency of public administration. It is becoming increasingly clear that without an extensive administrative reform aimed to improve state apparatus functioning, the introduction of e-government will be reduced to time-consuming and unsuccessful attempts.

A way out of this situation may be to adopt a new theoretical paradigm of administrative reform, in which e-government will no longer be an appendage of bureaucratic structures, and a systemic result-oriented management of all administrative processes will become the central component of public administration. The quality management theory and a programmed state model can make up that paradigm.

The basic postulate of the said theory is that not only the end result, but each stage of the administrative process should be considered in terms of quality management. That is to say, transition to a process-oriented management model, where administrative activity is seen as a system of interrelated processes, renders management a total character; thus quality, rather than being some specific task, is rooted in and officially assigned to each process.

Building a programmed state requires fundamental transformation of the entire public administration system, in the first place, carrying out of a structural and functional reform. It is necessary to adopt a structure of authorities, in which the scope of their power, mutual accountability, and the nature of responsibility are determined directly by the character of their functions. The next step should be a total regulation of all the administrative procedures, i.e. besides charging public authorities with a clear set of functions, a procedure for their fulfillment should also be strictly defined.

A crucial element in building a programmed government is to develop an effective evaluation system, which, according to the quality management methodology, should focus not so much on the analysis of state activity effects, as on analyzing the administrative process proper, checking its character against the volume of invested resources and its outcome in order to maximize public administration processes efficiency.

In general, the concept of e-governance in a programmed state as part of the information society integrates and develops mechanisms for e-government, e-democracy and open government. E-governance mechanisms ensure the development of public administration from bottom to top, making it a constant cognitive search for alternatives directed from the civil society and civil partnership system to a network public administration.

In this regard, the paper research objectives are further development of the e-governance methodology under the conditions of an emerging information society, and providing practical recommendations for strategies and mechanisms of e-government and e-democracy development.

The object of study is e-governance in an information society.

The subject of research is strategy, tools and methodologies of e-governance providing the development of e-government, e-democracy, and open government.

Practicing e-governance is impossible without understanding the theoretical foundations of public management mechanisms and their constituent parts, i.e. e-government mechanisms. Without exploring the category of 'public administration mechanism', the problem of improving its efficiency can not be solved, as public administration performance depends on availability of fully functioning mechanisms.

Scientific literature makes quite a wide use of the term 'public (state) administration mechanism'; however its meaning and structure are interpreted differently by academics and practitioners.

Analysis of scientific research into the content of the governance mechanism concept has made it possible to define the mechanism in question as a complex system designed to achieve the set objectives, which has its structure, methods, instruments, leverage of impact on management objects, and is backed up by the relevant legal, regulatory and information support. Based on the definition of the public administration mechanism given in this book, an attempt is made to generalize approaches to classification of the integrated e-governance mechanism and e-democracy as its component.

1. STRATEGY OF INFORMATION SOCIETY

1.1. Information society as a knowledge society

An information society is a theoretical concept of the post-industrial society, a historical phase of a possible evolution of the civilization, where information and knowledge are produced within a single information space. Information and knowledge should become the main production products of the information society. The characteristic features of the information society are as follows [29]:

– an enhenced role of the information and knowledge society;

– expansion of the community engaged in application of IT, communications, and production of information products and services, with an increase of their share in GDP;

– development of informatization and the use of IT in social and economic relations;

– creation of a global information space that provides effective information interaction of people, their access to global information resources and satisfaction of their needs for information products and services.

One of the most interesting fundamental philosophical concepts of the information society belongs to a Japanese scientist Y. Masuda. The basic principles of a future society composition, set forth in his book "The Information Society as Post-industrial Society", are as below [17]:

– a basis for a new society will be laid by computer technology with its fundamental function to replace or enhance human mental work;

– the information revolution will quickly turn into a new productive force making it possible to mass-produce cognitive, systematized information, technologies and knowledge;

– a potential market will be confined within the "boundaries of the known"; the possibilities of problem-solving and developing cooperation will expand;

– intelligent production will take the lead in the economy, and its products will accumulate, the accumulated information being disseminated through synergistic production and shared use;

– a "free community" will become the key subject of the new information society's social activity, while "participatory democracy" will make its political system;

– the main aim of the new society will be realization of "the value of time".

As an American information society theorist O. Toffler rightly puts it: "We are the children of the next transformation, the Third Wave." O. Toffler lists such features of the new formation as demassification and de-hierarchization of society and culture; deconcentration of production and population; a sharp intensification of information exchange; convergence of production and consumption; polycentric, local self-governmental political systems; environmental reconstruction of the economy and putting hazardous activities beyond the pale of the Earth;

individualization of personality to preserve solidarity relations between people who practically "have nothing to share" in the information age; cosmopolitization; and so on.

The book by D. Bell "The social framework of the Information Society" presents a version of the converging ideas of postindustrialism and information society. According to D. Bell, the term of 'information society' is a new name for the post-industrial society, which does not emphasize its position in the sequence of social development stages – "after the industrial society" – but rather the basis for determining its social structure i.e. information. An information society, in D. Bell's interpretation, has all the main characteristics of a post-industrial society (service economy, a decisive role of theoretical knowledge, orientation to the future and the relevant technology management, development of new intelligent technologies). D. Bell regards knowledge and information not only an "agent of post-industrial society transformation", but also as a society's "strategic resource'.

In his work titled "Powershift", O. Toffler defines the information society as a society where a factor and scope of knowledge play a crucial role in social development. Presenting a society as a system that distributes power between its three foundations (power, money and information), O. Toffler builds a kind of historic periodization: the basis of the pre-industrial era is formed by power; the heart of the industrial stage is money; and the modern society is based on knowledge.

A new stage in the study of social, political, and economic characteristics of the information society is associated with the name of M. Castells. The starting point of his theories is the global economy and international financial markets. Following an assumption that the very nature of information makes it possible to easily overcome any obstacles and boundaries, M. Castells describes the information age as the age of globalization, network structures being both a tool and a product of a globalized society. According to M. Castells, it is these networks that constitute the new social morphology of our societies, and spreading of the "network" logic greatly affects the course and result of the processes associated with the production, daily life, culture and power.

M. McLuhan is considered to be one of the classics of mass communication theory. M. McLuhan introduced "e-society"as a leading concept; hence his desire to explore the development of modern culture, primarily from the perspective of the place that e-communication means hold in it, and communication processes.

M. McLuhan focused his attention mainly on television as a representative of the entire global e-reality – speaking about the impact of television, he sought to identify trends common to all the mass media. As an aesthetic and psychological, as well as a social object, TV attracts attention because, according to M. McLuhan, it "absorbs" other media sources (radio, cinema, press), thus becoming a key element of IT and information networks i.e. "e-society" [98]. M. McLuhan discovers that in the modern times, apart from television perception, all the vital functions of a modern society are also increasingly carried out on a

mosaic resonance principle by using telecommunications, mass media and computers.

It should be noted that the majority of the US and European researchers, since the mid-1980s, have emphasized not so much the role and meaning of information as knowledge which has led to defining the future society as a knowledge society.

The Ukrainian scientists have also been studying the information society. For example, M. Zhurovskiy identifies three periods of social development built on knowledge and information (and three concepts respectively) at the turn of the 21st century [30].

At the first stage, it was typical of the communication society of 1980s – early 1990s to digitalize important information, creating archives to store it, to transmit data over long distances with the help of the new technical facilities, and to start developing a global computer network of the Internet.

The second stage got the name of an information society. From the second half of the 1990s, information began to be used as a commodity that can be bought and sold.

The name of the third stage – "a society built on knowledge" – originated from the previous two, combining ICT within a human component. A communication and information society is based on technologies; a society is built on knowledge by creative people equipped with technologies [35].

V. Skalatskiy, exploring the information society, highlights the key indicators, by which to characterize information society formation, as follws:

– a system of technological equipment indicators: its main purpose is to measure and evaluate the state of development of information and communication technologies in different countries. Thus, on the one hand, tools that directly provide all the necessary operations of information processing, transfer or use are considered; on the other hand – the state of resources enabling these actions, in particular human resources;

– the second system of indicators called "communication transparency indicator" is intended to evaluate the degree of information and communication technologies utilization in the processes of interaction among all groups of population, businesses, entrepreneurs and authorities, and within each of these categories;

– the third indicator system is called information society status indicator or information society index. The system examines the state of ICT and shows the growth rates of IT development, dissemination, and use of in general. This information society index is a characteristic, which allows evaluating the degree of any country's integration into the global information system [82].

In transition to the information society, the top priority is not the problem of further technicalizing of the society, as it was thought a few years ago, but that of its intellectualization, creation and implementation of new social technologies based on effective use of the main strategic resource of the society – knowledge.

The recent works of economists indicate that transforming information into an important production resource changes the paradigm of social evolution, reduces the dependence of the country's economic growth on availability of natural resources, the size of capital assests and able-bodied population, and other extensive factors, which have the highest entropy, i.e. chaotic scattering.

Among methodological works, the book by A. Rakitov "Philosophy of the computer revolution" [73], which examines the regularities of creating a new civilization, is of particular importance. A. Rakitov perceives the information society as a social system, which emerged in the historical process for objective reasons stipulated by a higher level of productive force development, in the first place – people. An enhanced role of information in the social progress means a step towards formation of the noosphere – a sphere of a determining impact of human thought and activity on biospheric processes. The basis for information society development is made up not by traditional material resources, but rather by information, intellectual ones: knowledge, science, organization, people's skills, their initiative, structures and mechanisms of forming a qualitatively new social intelligence.

Summarizing the existing approaches to interpretation of the information society concept, A. Chernov [96] says that at the present time this term means:

– a new type of society, formed as a result of a new global social revolution generated by the explosive development and convergence of information and communication technologies;

– a knowledge society, i.e. a society where the main prerequisite for the welfare of every individual and every state is knowledge gained through unhindered access to information and the ability to work with it;

– a global society, in which exchange of information is not restricted by either time, spatial, or political constraints, which, on the one hand, promotes interpenetration of cultures, while on the other hand – opens up new opportunities for every community's self-identification.

From the above definition, it is seen that there is a little difference between the concept of 'information society' and that of 'knowledge society'. However, the practice of social life makes its corrections. A difference in approach to these definitions is seen most clearly in the activity of international organizations.

For example, the UN World Summit on the Information Society (the first one took place in 2003 in Geneva, the second – in 2005 in Tunisia) addressed the problem of a comprehensive expansion of the ICT use worldwide. The use of ICT is seen as a basis for sustainable development of virtually all elements of social infrastructure, such as: e-government, e-business activities, e-learning, e-healthcare, e-employment, e-environment, e-agriculture, electronic research activities and a number of others.

Following the Summit, UNESCO issued a document "From the information society to the knowledge society". Its premise is that today

we should talk not so much about spreading information flow as the possibility of their quality mastering as the basis for new knowledge and the foundation of a dynamically developing society.

According to its position, UNESCO identifies the following principles, compliance with which is a prerequisite for the development of just knowledge societies: cultural diversity; equal access to education; universal access to information in the public domain; freedom of expression.

The information society is a functional block of the knowledge society. This can be explained by the fact that the information society concept is connected with the idea of technological innovation, while the knowledge society includes social, cultural, economic, political and other aspects of social transformations, as well as a wider multifaceted view of a society of the future. The knowledge society concept reflects the complexity and dynamism of social changes better than the information society concept.

Given this approach, we can say that the information society includes the original form of the emerging knowledge society.

Therefore, the understanding of the nature of information revolution in the economy should be limited to the fact that IT do not change activities, but their technological ability to use new knowledge as a direct productive force. Such changes in the structure of the modern economy are now regarded as a global structural shift that marks a transition from material to intellectual knowledge-based economy [17].

The concept a knowledge-based or intellectual economy, which has gained currency in the world economic literature over the recent years, reflects the fact that scientific knowledge and specialized unique skills of their carriers are a major source and key factor of developing material and non-material production, maintenance of sustainable economic development.

Researchers D. Chereshkin and H. Smolian refer the following factors to the basic features of the information society [95]:

– creation of a global information space providing efficient information interaction of people, their access to global information resources and satisfaction of their social and personal needs for information products and services;

– establishment and economic dominance of new technological patterns, based on the mass use of network IT and leading to new forms of social and economic activity (distance education, telework, telemedicine, e-commerce, e-democracy, etc.);

– creation and development of information and knowledge markets as factors of production, in addition to the markets of natural resources, labor and capital; transformation of a society's information resources into real resources for socio-economic development, turning information into a commodity;

– an enhanced role of infrastructure (telecommunication, transport, organizational) in the system of social production and a growing trend towards joint operation of economic information and cash flows;

– the actual satisfaction of a society's needs for information products and services;

– improvement of education by expanding the possibilities of information exchange at the international, national and regional levels, resulting in a greater role of skills, professionalism, and creative abilities as the most important characteristics of labor services;

– an effective system to ensure the rights of citizens and social institutions to a free information access, dissemination, and use as an essential condition for democratic development, and improved interaction with public authorities.

Transition to the information society is accompanied by a shift of the point of influence in the economy from direct material production to service rendering, information services including. Moreover, information has changed the nature of the work in traditional fields of material production. Emergence of robotic systems, a widespread introduction of microprocessor technology elements are the main causes of this phenomenon.

The new forms of production organization match the information society economy. Information technology has made possible the so-called flexible production that can be re-adjusted within a short time to produce modified products. Since such systems allow responding to changes in market demand much faster than traditional ones, they are cost-effective.

The actual analysis of changes in the structure of employment in advanced countries, most developed with regard to the information society, has led to the following results [17]:

– the proportion of the people employed in agricultural and traditional industrial labor continues to decrease;

– the share of the population employed in the service sector has increased, and a variety of activities in this area is growing;

– the number of managerial and technical jobs is growing rapidly;

– the share of workers with medium professional qualifications is decreasing, while that with qualification of the upper and lower levels is getting bigger;

– proportion of employment requiring a high level of education is growing faster than the share of the low level category.

The advanced countries differ essentially in terms of the above parameters, although the impact of mass introduction of IT on all of them is unquestionable.

Forming the information society has brought about a revision of the public information policy priorities in the advanced countries, fostering the development and implementation of government programs that promote formation and evolution of the information society or its individual components: the use of the Internet, the introduction of e-learning, e-government, the development of e-commerce, e-healthcare, and the virtual community.

Analysis of international experience shows that there is no single successful program of the information society development. Every

strategic program or plan should be individual and should take into account the characteristics of a specific country or region.

There are various strategies for information society development, differing even among advanced countries. A theoretical justification for this development is lagging behind the practical needs, developing quite rapidly worldwide. It is advisable to consider this development theoretically to approach a systemic understanding of these processes. Thus, many contemporary theoretical and methodological and applied research works substantiate insufficiently the strategies and programs of public policy-making for information society development [28].

1.2. Strategies and programs of Information Society

Worldwide trends are transformation of the post-industrial society under the conditions of accelerating globalization, a growth of the service sphere and non-material production due to scientific and technological progress, including a large-scale, deep and dynamic penetration of ICT into all spheres of life of the individual, society, business entities, and the state.

A rational study of the impact of a set of these and other opposedly directed factors and features of the country's state and development calls for making a separate public policy of developing information and knowledge societies, which requires joint efforts of government, business, and civil society.

Thus, for most of the advanced countries, information society development is a national priority, regarded as a challenge of the national scale. Information and communication technologies are assigned the role of a tool for social and economic progress, one of the main factors of innovation development of the economy.

International experience, particularly the European policy "Digital Agenda for Europe 2020", shows that digital technologies have become a driving force of economic and social development, economic recovery throughout the world, laying the foundations for future sustainable development.

Most of the advanced countries have set the goal of accelerated transition to a new stage of human development – the information society, which can fulfill the following tasks most effectively and timely:

– to increase the national competitive capacity through development of human potential, in the first place, in the areas of highly intellectual labor;

– to improve the quality of citizens' life through economic growth, providing equal and quality access to information, education, healthcare and administrative services of public authorities and local governments; create new jobs and expand employment opportunities for the population; strengthen social protection of vulnerable groups (including people in need of social aid and rehabilitation) due to the widespread use of ICT;

– to promote the development of an open democratic society that guarantees constitutional rights of citizens to participate in public life and decision-making of public authorities and local governments (LG).

The World Summit on the Information Society Issues was dedicated to information society development; that highest level meeting was held in two stages. The first Geneva stage that took place on 10-12 December, 2003 ended in adoption of the Geneva Declaration of Principles "Building the Information Society – global challenge in the new millennium" and the Geneva Plan of Action. The second stage – Tunisian, held on 16-18 November, 2005, adopted the Tunis Commitment and the Tunis Agenda for the Information Society.

The Geneva Declaration of Principles calls upon the international community to build an information society, "people-oriented, open to all, where everyone can create information and knowledge, have access to, use and share them", and binds the world countries to "turn a digital technology gap into digital opportunities for all" and ensure a universal, ubiquitous, equal and affordable in terms of prices access to ICT infrastructure and services.

Analysis of the World Summit basic documents and the status of their implementation around the world gives reason to identify the main positive points of this top-level event [19] as follows:

1. The Summit was initially planned as a multilevel cooperation of all stakeholders, in which the private sector, civil society and international organizations are to work together with governments towards putting declarations into actions.

2. During the first stage of the Summit, government leaders set ten priorities to improve the access to ICT, including connection to the global network of all types of settlements, universities, colleges, secondary and primary schools, hospitals, libraries etc., which had to be achieved by 2015.

3. The Summit was organized as a unique two-stage meeting at the highest level which implied that the vision of the problems and their solutions, formed in Geneva, could be developed and supplemented in Tunisia. In particular, the Tunisian stage of the Summit defined the mechanism of task fulfillment in the areas of activity set out in the Geneva Plan of Action, based on the list of mediators/leading organizations that are to be involved. Besides, a methodology for estimating the size of the digital gap both nationally and internationally was coordinated.

Thus in 2003–2005, between the first and the second stages of the Summit, much was done to achieve the set goals and conduct monitoring, namely:

– the partnership formed a core set of indices to measure the information society development;

– several different composite indices were developed, two of which are noted in the Tunis Agenda for the Information Society – ICT Development Index (IDI), and the digital accessibility index (DAI) (to be discussed below);

– the "Golden Book" report of February 2006 collected and published more than 380 new projects presented at the Tunis Summit to be used by the International Telecommunication Union as an example of successful implementation of ICT.

The EU programs are ambitious enough to overcome the "digital divide" between the EU countries and their international competitors. They consist of sections on e-government, e-health, e-education, and e-business, providing online public services, and are focused on the development of broadband networks and their access facilities, since the broadband technology is transforming the Internet, opening up new possibilities for interactive multimedia services, the use of which is possible only through high-speed data transmission.

According to the goals of the World Summit on the Information Society, many nations are developing strategies and programs to create an information society and define the role of ICT in their social and economic development, taking into account the specific needs and circumstances of each country.

To evaluate the results of building an information society, the International Telecommunication Union in 2006 developed a standard digital opportunity index (DOI), based solely on internationally agreed indicators of ICT. This makes it a valuable tool for measuring the information society. The measurement methodology and results are presented in detail in the report of the International Telecommunication Union "Global Information Society".

This report can be viewed as a direct response to the call of the World Summit on the Information Society to "track global progress in the use of ICT to achieve internationally agreed development goals and tasks".

Analysis of socio-economic factors shows their impact on the values of the information society indicators. The methodological basis for this analysis was the calculated correlation between the major components of the index of digital capacity and socio-economic development indices [19].

The inverse dependence of statistical indicators of information society development on a country's business climate indicators was found to be quite large. In particular, the more barriers there are in the system to initiate or liquidate a business, or licensing barriers, the lower the value of the digital capacity index for a country. In addition, there should be no doubt as to globally confirmed dependence of the information society on the key economic development indicators such as GDP per capita and the income level (to build a matrix, an indicator of "proportion of the poor" was used) .

It should be noted that in most Western countries the development of the information society has reached a very high level – their governments took ICT as a bais for socio-economic development, while their monitoring systems track the impact of ICT on the values of socio-economic indicators.

1.3. Electronic communication as a mechanism of an innovation-oriented society

The problem of improving economic competitiveness is directly related to innovation policy of the state, which should be aimed at creating favorable conditions for the development of research, technological development, education, technological upgrading of the economy and improving the welfare of citizens.

The scientific and technological direction of the country's development and compliance of its innovation policy with the key provisions of its general economic policy are strategic guidelines that have to ensure an economic upswing of the state. The main content of public administration of innovative development should be a well-coordinated work of all parts of the economic mechanism. The result should be a significant acceleration of the country's economic growth and enhanced competitiveness of its economy [84].

It is the establishment of an effective innovation management system that innovation policy measures should be focused on, as the effectiveness of public policy in the field of science and technology will determine the competitiveness of the domestic economy. Today, about 90% of advanced countries' GDP is obtained through implementation of new technologies and developments that make it possible to create effective production, minimize resource consumption and so on. The experience of these countries shows that the role of public authorities in the innovative processes organization and regulation is much more significant than in regulation of conventional economic activity [86].

The scientific community still has a significant interest in this issue, which is illustrated by numerous publications in professional journals of different fields. In particular, T. Bova has revealed the basic principles of forming a mechanism for public administration of the national innovation system [22]; V. Bondarchuk defined the role of state regulation in supporting the system of regional innovation development [23]; V. Budkin considered fundamental approaches to developing innovation activity, having discerned its six main patterns [25]; A. Diehtiar, M. Goncharenko have substantiated directions of methodological development and devised an algorithm for optimal investment decisions to be made by the government [31]; A. Kniazevich explained the crucial role of innovative lag length in the innovation process implementation and acceleration [42]; A. Krekhivsky and A. Salikhov examined prerequisites for forming new national innovation strategies in Europe and developed recommendations for their improvement in Ukraine [76]; A. Proshchalykina identified the ways to accelerate innovation in transition economies [69]; V. Pshenichna analyzed the features of formation and development of a mechanism for implementing a state investment policy [70]; A. Melnychenko improved an innovation-investment model of the national economy development [49]; A. Orlov defined an approach to building an innovative theory of government [58].

However, alongside with the achievements, there is a problem of developing an innovation-oriented society. This problem emerges under the conditions of an enhanced role of technological innovation in the society, especially the e-communications sector (telecommunications), which is increasingly affecting the development of modern economic systems, being a connecting link both for the industrial sector, service sector, consumers, and for different regions and economic centers. Therefore, the development of e-communications as a basic component of the information society intended to ensure the efficient interaction of all the social structures, including government agencies, through providing them with professional interaction services is an important task of the socio-economic growth.

The main goal of the research in this section is to determine the mechanisms of e-communcations (telecommunications) as a real strategic factor of economic competitiveness in the global market.

The directions of innovation policy in this area are determined by the following features of telecommunications industry:

– the telecommunications market provides a unique product that combines production of goods, services and technologies;

– a potential target market of telecommunication products is the majority of the population, and the extent of its coverage depends on the time factor and new technical possibilities;

– due to specifications of telecommunications companies' products, it is virtually impossible and impractical to act in the national framework only.

Therefore, formation of mechanisms for innovational development of the telecommunications sector should be go in parallel with the renewal of fixed assets, which are to become the main source of increased output and conditions for providing telecommunications services according to the standards of the best communication companies of the world.

The analysis of these factors with account of international trends allowed us to determine the structure of mechanisms activating e-communications innovative development, which are grouped in Fig. 1.1 [41].

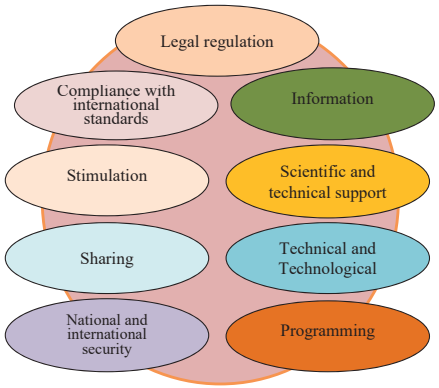

Fig. 1.1. Mechanisms of Communication Development

The main regulator of e-communications in most European countries is introduction of a mechanism for incentive-based regulation of ICT to develop the industry. It is additional incentives for the ICT business that are to create conditions for further development of telecommunications networks and the expansion of the market participants' activity.

In order to benefit from the economy of scale and reduce investments to renovation of the national telecommunication industry, it is expedient to apply the mechanism of sharing telecommunications infrastructure among different operators and service providers. The degree and method of infrastructure sharing varies in different countries, depending on their legal basis and competitive climate.

Sharing of infrastructure reduces duplication, targets investment to underserved areas and innovative products, and improves customer service.

A regular deployment of telecommunication industry infrastructure benefits from the economy of scale. The costs of telecom operators are mainly caused by significant investments in technology and infrastructure deployment. Being permanent and irreversible, these costs are a high risk factor.

Besides, infrastructure maintenance and upgrading make the risk even higher. For example, fixed-line operators are now migrating to next-generation networks, and the majority of mobile operators have launched 4G-infrastructure and work on transition to 5G-infrastructures. Thus, infrastructure sharing can significantly reduce entry barriers and development risks.

Also, sharing of infrastructure has a huge impact on competition. The market becomes more attractive for new players due to reduced entry barriers. These players can enhance competition by investing effectively. Reducing the cost of network deployment, sharing allows operators to pay attention to innovation, improve customer service and, ultimately, leads to better commercial proposals and healthy competition.

The mechanism of compliance with the international standards applied to the field of the national e-communications should function with regard to the need to integrate its infrastructure into the global network. The process prerequisite is elaboration and application of the national ICT standards harmonized with the relevant international and European standards, and implementation of a unified state policy on technical standardization and unification of technical and technological solutions.

The legal mechanism of state regulation provides for: governance and regulation of the telecommunications field, including the allocation and use of radio-frequency and numbering resources, and address space of the Internet; access to the market; state control and market surveillance; regulation of e-communications market for construction, operation and use of public telecommunications networks; and regulation of telecommunications services [84].

Based on the provisions of the regulations in the telecommunications field, an object is involved in the following social relations: institutional (structure of authorities and regulation); organizational (registration, licensing, etc.); management of telecommunications networks (the use of telecommunications equipment, radioelectronic facilities and emitting devices, etc.); the use of public telecommunications networks in emergency situations and war status; interconnection of telecommunications networks; allocation, assignment and use of radio-frequency and numbering resources; administration of address space of the national segment of the Internet; organization and implementation of broadcasting (including public television and radio); regulation of the legal status of the telecommunications market entities, namely: operators, telecommunications providers, broadcasters, software service providers, customers of telecommunications services, etc.; provision and use of telecommunications services; regulation of tariffs and settlements; regulation of international cooperation in the field of telecommunications [79].

The structure of the mechanism of scientific and technological support for the national information and communication infrastructure includes: conceptual development of technological solutions and technical infrastructure; conducting research to use the latest technical means, technical and technological solutions in creation and development of the national information and communication infrastructure and its components; introduction of new services and assuring their quality; development of legal regulatory and normative documents for settlement of issues related to creation, operation and development of the national information and communication infrastructure and activities of its subjects.

Research, developmental, and designing work should be carried out according to the established procedure by specialized (field-related) scientific, engineering, and designing organizations with the involvement of scientists and experts from universities, industrial enterprises, supplying companies, operators of telecommunications and postal services of all forms of ownership. Arrangement and order of operations is to be carried out by competent public authorities.

Creation, putting into operation, maintenance and further development of information and communication infrastructure, including elaboration of design, engineering, maintenance documentation for the infrastructure and its components, should be performed in accordance with the regulations effective in construction, a set of standards for development of automated systems, the regulatory documents for creation of complex information security systems in the sphere of technical and cryptographic protection of information. All components should be provided with a complete package of design, detailed engineering, and maintenance documentation.

Introduction of the technical and technological mechanism of e-communications provides unification of the following structural areas:

– cable, optical-fiber, radio-relay communications lines; station-based and terminal chanelling, routing, transceiver, emmitting telecommunications equipment of wire and wireless communications; end-user telecommunications equipment of wire and wireless communications; hardware platforms, servers, personal computers, data warehousing, data archiving tools; basic infrastructure and technical means of data processing centers (power, earthing, air conditioning, security and fire alarm systems, fire fighting, etc.); technical and cryptographic systems for protection of information; technical means of mailing service; premises, buildings, towers;

– standard software, hardware and software platforms of servers and workstations;

– specialized or universal software and/or hardware and software platforms, components of the information and communication infrastructure providing collection, search, creation, conversion, storage, analysis, representation and protection of information in order to meet the information needs of users (protected e-document platform, antivirus protection platform, platform for distributed data processing according to a "cloud computing" model, digital signature platform (EDS) etc.); specialized hardware and software platforms of the switching components of information and telecommunications systems (subscriber stations providing software encryption, emergency call routing units, flexible software switches, etc.); modern technology of wire and radio communication; modern mailing technologies, integrated with the telecommunication technology.

The programming mechanism provides introduction of e-communications software in accordance with the following basic requirements: modularity; openness; compatibility with previous applications; scalability; platform independence; compatibility with infrastructure applications; diagnostics of viruses built in client sites and servers; an effective recovery system in case of force majeure and so on.

The information mechanism is based on introduction into the information and communication infrastructure of the information support of two categories: information support for functioning of information and communication infrastructure components, which determines the composition, structure, methods of data organization in systems and subsystems, requirements for information exchange between system components, database (DB) management, compatibility with other systems; information resources, including the e-media in DB and data banks, depositories, libraries, archives, reserves, museum storages, data processing centers, etc.

The information support of the first category is defined by the developer and supplier of information and communication infrastructure components.

The information resources of e-communications are created due to the work of components of the system producing information products,

namely: different versions of mass media, news agencies, studios, cultural institutions, etc; the system of public authorties and local government bodies, political parties and other public associations; industrial, scientific, designing, educational, and medical institutions, creative teams and individuals and the like.

In the course of e-communications creation, operation and development, a special role is played by implementation of the national and international security mechanism protecting information in the system components, preventing unauthorized distribution, use, violation of information integrity, privacy, accessibility, and thereby preventing damage to the vital interests of people, society and the state.

To organize an effective system of information security in the national information and communication infrastructure, it is necessary to cooperate with international information security organizations, in particular with the European Agency for Network and Information Security, within the scope of its tasks of cooperation with third countries to promote the culture of network and information security.

It is necessary to create a comprehensive information security system within the national e-communications and their components, built on a modular priniciple in accordance with the current law and regulations on technical and cryptographic protection of information.

Thus, the telecommunications industry is characterized by the following features: telecommunications provides the market with a unique product that combines production of goods, services and technologies; a potential target market of telecommunications products is the majority of the population; specifications of telecommunications companies' products make it virtually impossible and impractical to act only within the national framework.

Innovative development of e-communications is constrained by the following factors: insufficient public funding of innovations and lack of own funds of communications enterprises; lack of scientific and methodological basis for an innovative e-communications system; low incentive for enterprises to implement research results; inadequate renewal of fixed assets in the telecommunications sector; incoordinated actions of innovation subjects.

To activate innovation processes in e-communications, a system has been proposed comprising the mechanisms of: incentive-based regulation; sharing of telecommunications infrastructure; compliance with international standards; normative and legal regulation; scientific, technical and technological, software and information support; national and international security. Implementation of these mechanisms will activate innovative processes in the field of e-communications and increase the competitiveness of the national economy.

2. METHODOLOGICAL FRAMEWORK OF E-GOVERNANCE

2.1. Functional model and electronic government components

The starting point of the present administrative reform was a crisis of the classic political and administrative management model. The crisis was caused by increased dysfunction of traditional bureaucratic structures and the limits reached by the cost approach to public administration, in which widening of the range of public services and improving their quality was associated directly with an increased tax burden on the society. The awareness of this crisis in terms of indissoluble connection between democracy and public sector performance, when the government is to provide goods and services to citizens, has led to revision of a number of basic principles of public administration and sparked a wave of administrative reform aimed at improving the efficiency and enhancing the functional capacity of the state.

One element of these reforms is development of e-government systems which involves transformation and optimization of the state functioning through the use of modern ICT, in the first place, the Internet, so as to provide public information and services online, as a tool to achieve better management. It should be emphasized that e-government is rightly regarded by most researchers not only to be a means of increasing public administration efficiency, but also as a fundamental element of a new model of information society democracy, since the e-government technologies create conditions for effective inclusion of citizens and civil society organizations in the process of developing and implementing public policy.

The term of 'electronic government' was first used in the USA in 1993. As a result of an active work of the global and national think-tanks and development organizations such as the Organisation for Economic Co-operation and Development, the World Bank and the UN, there appeared its most well-known definitions.

Among the commonly used definitions of e-government, a functional definition, given by the OECD, deserves a special prominence: "E-government provides an opportunity to develop new relations between governments, citizens, service users and companies by using new ICT that allow disseminating and collecting information and rendering services both internally and externally (government-to-citizens, government-to-business, government-to-government) to provide services, make decisions and assume responsibility" [13].

According to the definition of the European Commission, e-government is the use of ICT in government structures in the context of institutional reforms and formation of civil servants' skills aimed to improve the functioning of state institutions and the quality of their services [102]. The World Bank gives the following definition of e-government: "By e-government we understand the use of information

and communication technologies for improvement of the productivity, efficiency, and transparency of the government and public control over it" [18].

Numerous definitions of e-government have one thing in common – they emphasize the active role of the state in implementing the concept of e-government as an initiator, implementation tool, coordinator, and key participant of administrative, service, democratic and governance processes.

In the modern literature, there are three approaches to the understanding of the term of 'electronic government' [50]. The first approach considers it as a transformation in providing administrative services with the use of ICT. It relies on a widespread practice of transferring effective management technologies from business to the public sector. The introduction of technology should provide access to a new level of service quality and convenience for users, while reducing service costs.

While the first approach is, in fact, limited to e-service in provision of administrative services, the representatives of the second approach point out that this is only a part of the content that is embedded in the concept of e-government, and regard the government as a high-tech organization, the functioning of which is provided with modern ICT means. This approach relies on the prospects of the information age, when it is organization of the entire government activity on the ICT basis that can provide public sector transformation to fit the new reality.

The third approach considers e-government as a new management model, adequate to network economy and information society. This is not just a broader interpretation that absorbs the first two approaches, but a completely new view of the public administration content and organization.

Attention should be paid to a number of subtleties, since the word 'government' in English has the meaning of not only the highest executive body, but the state as a whole, while the term of 'e-government' applies to forms and mechanisms of realizing power by means of ICT. In the Western countries, the introduction of ICT empowered the governments which induced major changes in public life. E-government has become an independent political strategy, rather than another technological solution within the bureaucratic machine.

Besides, the scientific community makes use of definitions similar in content to e-government, such as 'e-administration', 'digital government', 'online government', as its synonyms. Examples of new terms coined in this sphere are 'm-government', which implies the use of mobile technology, and 'u-government', describing e-government of a new generation that uses ubiquitous technologies.

The e-government concept involves creation of a government that combines organizational innovations with new ICT for basic government functions in a constantly changing environment. As e-government took more from the government than from technology or e-environment, the

basic dimensions of e-government can be deduced from the government functions.

The government functions that laid the basis for the basic dimensions (components) of e-government, are divided into the following four functions [11]:

1. E-administration mostly affects all the governmental administrative and operational processes that employ ICT, including routine office tasks and key management functions of public organizations, such as planning, organization, recruitment, management and control [6]. E-administration is closely related to e-governance, which includes the use of ICT to improve the managing of the government itself, starting from simplifying business processes of e-protocols and optimizing information movement and integration [4].

2. E-services are characterized by provision of administrative services to citizens, businesses and other target audiences, using ICT. E-services consist of information, communication, and transaction services provided in various spheres of social activity such as social security, business development, healthcare and education [14].

3. E-interaction, understood in the public sector context as "public e-interaction", is management and regulation of stakeholders' relations on a hierarchical basis by means of ICT for politics, services, and government development functions. In other words, it is cooperation, interaction and partnership between social organizations, corporations, non-governmental organizations, population groups and active citizens established for effective coordination of internal and external resources aimed to achieve public policy objectives. [3]

4. E-democracy is characterized by democratic structures, processes and methods that use ICT to enhance transparency, democratic decision-making, involvement and participation of citizens [1].

The applied branching of e-government is associated with key stakeholder groups, the relations (e-interaction) of which have five basic forms (sectors) (Fig. 2.1): government-to-citizens (G2C), citizens-to-government (C2G), government-to-government (G2G), government-to-business (G2B), business-to-government (B2G).

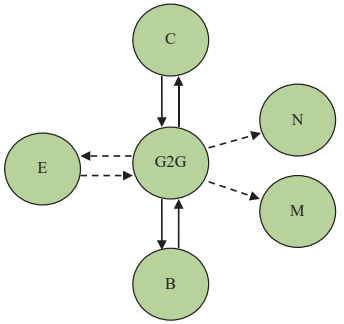

Fig. 2.1. Basic and expanded sectors of e-government

Apart from those, there are e-government internal relations, such as government-to-employees (G2E) and employees-to-government (E2G). There are also other relationships, such as government-to-NGOs (G2N), government-to-market (G2M), etc. [103].

Different countries implement the e-government concept in accordance with the functional model of e-government (Fig. 2.2) [103]. The starting point for the general functional model of e-government is the state and its citizens. No matter which applications, e-services or communication tools are introduced, they all should be based to the greatest possible extent on the needs of citizens and their sample behavior. The center of a democratic system is citizens that can perform different roles – those of voters, taxpayers, political activists, workers, residents and users of services [11]. By implementation of the e-government concept, citizens can get a more direct political control and power over decision-making problems and management processes.

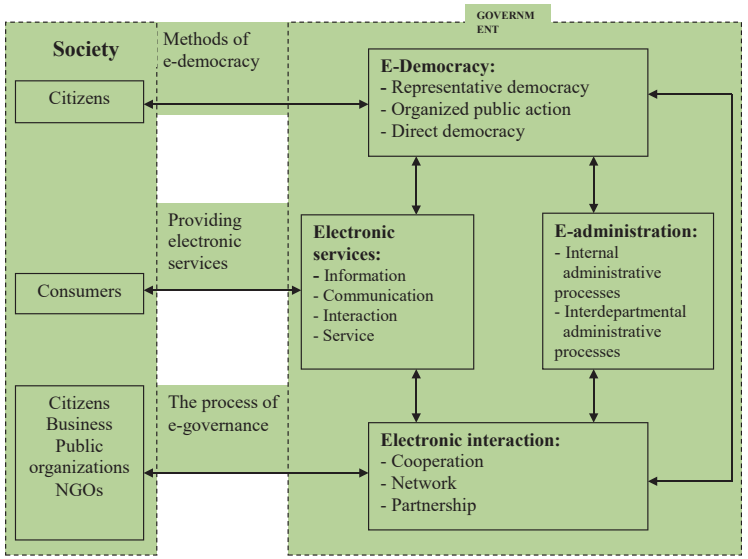

Fig. 2.2. Functional model of e-government

The high efficiency of e-government projects is stipulated by a uniform development of projects on all the components of e-government (e-democracy, e-services, e-administration, e-interaction).

The pre-condition for the functioning of e-government is to provide citizens with access to e-communications; that is the access should be included in the model of e-government as one of its essential elements.

The main purpose of creating e-government is that it is not analogous or complementary to the traditional government; it defines a new way of interaction among the participants based on an active use of e-communications aimed to improve the efficiency of administrative services [103].

Creation of e-government has the following main objectives: optimizing delivery of government services to citizens and businesses; increasing the level of voters' participation in the management and administration processes of the country, region, city; support and better self-service opportunities for citizens; growth citizens' technological awareness and skills; reduced impact of a geographical location factor.

Therefore, creation of e-government should ensure not only a more efficient and less costly administration, but also a radical change in the relationship between the society and the government. Ultimately, this will lead to improvement of democracy and greater accountability of the government to its people.

The main results of establishing e-government, according to the European Commission, will be [102]: improved quality of services rendered by government agencies; reduced time of service; fewer administrative barriers; expanding a set of administrative services; improved efficiency of government agencies; higher customer satisfaction.

The reform of public administration is largely based on the concept of New Public Management. The phenomenon of new public management emerged as part of a wider movement for "Reinventing Government" (RG), which started in advanced countries in the late 1970s. According to many experts, this movement is one of the major changes in public administration philosophy and paradigm. The authors of this concept are David Osborne and Ted Hebler, who offer the RG principles not as standards, but as generalization of changes in public administration [12], which sets out the basic principles as follows:

– the state is not seen as a necessary evil, but as a way of collective action and social problem-solving;

– an effective state must meet the requirements of the information society and knowledge economy: large, centralized and standardized bureaucracy should remain in the past;

– the problem of public administration is not people (bureaucrats), but bureaucracy as a phenomenon;

– traditional democracy can not solve the problems of today's state by redistributing funds – efficiency solutions depend on government restructuring;

– it is necessary to provide equal opportunities for all citizens.

The basic idea of this concept is the assertion that primary importance should be assigned not to the government, but to a change of incentives in the public sector that would make the process of public control more business-like and, therefore, more efficient. This, in turn, will facilitate the transfer of resources from sectors with a low rate of return to higher-profit branches. The basic principles of the Reinventing Government concept in the present conditions can be summarized as follows [99]:

– the need for competition among organizations that claim provision of services;

– vesting local communities with bigger powers;

– focus on the end result – measuring performance and concentration on it is a way to improve the state apparatus;

– focus on the mission instead of a simple implementation of the rules has a number of benefits, in particular increased innovation and flexibility of organizational structure;

– a model of a "service state" – representation of citizens as customers increases responsibility and depoliticizes distribution of funds among public-sector organizations, stimulates innovation and differentiation of services, and results in less waste in the current activities of the public sector;

– prevention of problems instead of solving them – long-term planning, preliminary identification and prevention issues are less expensive than "crash efforts";

– state agencies focus on making money rather than on spending;

– decentralization of government activity – giving more authority to public officials and creation of project teams;

– reliance on market mechanisms in government agencies' activity;

– the state acting as a catalyst of changes in the commercial and non-governmental sectors for the sake of solving social problems.

It should be noted that civil service in many countries is going through hard times, and its reform is a standing topic for discussion in some countries, or an ongoing systemic process – in others. The problems underlying the need for civil service reform, are formulated as follows:

– a continuous growth of aggregate employment and wage costs in the public sector increases the burden on the budgets of different levels;

– poor motivation of civil servants and a lack of qualified staff leads to lower efficiency of the state apparatus;

– an aggravating protectionism and corruption determine the low public trust in officials and the state apparatus as a whole;

– the state apparatus inability to respond to changes causes operational inefficiency and low quality of administrative services.

The concept and practice of new public management presuppose a specific set of components being implemented in some countries with a varying degree of completeness during public administration reform. The following basic principles of the new public management concept can be formulated [99]:

– the use by public institutions of management methods inherent in private firms, a transition from the bureaucratic style of leadership to greater flexibility and new technologies, including electronic ones;

– introduction of competition in the public sector, understanding competition as a key factor for reducing the cost of services and improving their quality; an active use of bidding procedures and improvement of efficiency due to the use of contractual relations both in the public sector and with private organizations;

– de-aggregation of government agencies, and on that basis – creation of units in which the interests of service production are separated from those of their delivery to citizens and organizations;

– practical and professional management, including accountability and selective control on behalf of superior public authorities;

– clear standards and measurers of goals, results and efficiency of units, a clear definition of indicators of purpose and task fulfillment, preferably in quantitative form;

– control of output functions: evaluation of results and not the process of obtaining them; coordination of promotion and allocation of resources and rewards with the level of results demonstrated in achievement of objectives and raising efficiency;

– transition to individualized services rendered to citizens and businesses;

– enhancement of discipline, improvement of human resource management, and reduction of costs.

Implementation of corporate management principles in reforming public authorities must take into account the specificity of administrative processes. Public control is realized by embedding special mechanisms into the work of public organizations, helping public functionaries to perform their tasks. Fulfillment of the set objectives by the state is reflected in three different areas – political, legal, and socio-economic. Each of these areas has its own traditions, values and specificity of work organization. Public administration is a form of actualization of the three areas of the state activity, and being an operating (largely procedural) activity, it includes resource planning, human resource management, management of projects, programs and processes, organizational design, etc.

The studies of administrative processes lay a special emphasis on importance of the politological approach. It has turned out that separation of resource management from politics, on which the new public management concept insists, has no chance to succeed. An overal direction of the administrative reform is actually switching from the new public management concept to that of management policies (governance). The latter concept combines the mechanisms, processes and institutions, through which citizens and their groups express their interests and exercise their legal rights. The general content of the management policy concept is that public administration is supposed to become less stringent, prescriptive and regulated; it should be based on horizontal rather than vertical relations between public authorities, civil society associations, and businesses [99].

The new approach also includes the concept of good governance, which, according to the UN methodology, is characterized by the following key features: cooperation and collaboration of citizens and government (participation); the rule of law; transparency of authorities and their decisions; responsiveness, corner-cutting; consensus-orientedness; equality and inclusion; effectiveness, efficiency and economy; accountability of authorities to citizens [15].

The concepts of 'democratic governance' and 'public administration', which are increasingly used in the UN programmes, in particular the United Nations Development Programme, for building composite indices

and carrying out a comparative assessment of the world countries, can be considered as the development of the good governance concept.

Formation of a new public management model stipulates a change in the principles of the ICT use in public administration: moving towards a deeper understanding of the ICT potential is reflected in transition from the e-government concept to that of e-governance. If the former concept focuses on government information transparency and online public service delivery, the new understanding includes such notions as cooperation, participation, consensus. In fact, we are speaking about e-democracy, which allows expanding the range of forms of citizens' impact on political decision-making and implementation [83].

The architecture of e-government can be presented as a combination of functional architecture (administrative regulations) and state information systems architecture that form the foundation of the entire modern state modernization program.

The strategy of developing e-government envisages that administrative services become available through multiple channels, including personal computers, information kiosks, mobile phones, digital channels, call centers, and contact centers.

Presently, most of the world public institutions, central, regional and local authorities have their own portals, united into a central government portal. The central government portal is viewed primarily as an important component of the infrastructure providing unified interface for public information system developers.

It is important that designing of public portals should be based on common components of e-business, i.e. a common information and telecommunications infrastructure (ITIS) and commercial portal services.

E-business components within the architectural model of e-government are centrally defined standards for such elements as transaction security, authentication and use of smart cards. When implementing an architectural model of e-government, it is important to adopt common standards and infrastructure to provide interaction and information sharing among government agencies, institutions, citizens, and businesses.

The key elements of this interaction is a secure government intranet and the Government Gateway. The Government Secure Intranet is a means of sharing information between different central government's departments, and through external gateways – with other public services and the Internet in general. The Government Secure Intranet is the basis for exchange of e-mails and e-documents with other government agencies, citizens and businesses [53].

The Government Gateway is based on the middleware layer that makes it possible to combine various information systems, providing access to the Internet. The Gateway provides interaction between different portal services by routing information and documents. The Government Gateway also provides identification and authentication, which help not only to identify users, but also to clearly figure out their rights of access to data and the information systems.

A general e-government model consists of three elements: a means of access for citizens and businesses (personal computers, contact centers, points of public access, digital television, mobile phones); e-business components (ITIS, business portals and sites); and interaction means (Government Secure Intranet, portals of ministries and departments, the Central government portal, regional and local portals and sites).

The Central government portal is to interact with such e-government components as portals of ministries and agencies, local state administrations, private companies and other web-sites for administrative service delivery to citizens and businesses.

Private companies provide public service facilities to enhance convenience and reduce the service costs of requests made by citizens and businesses.

It is generally believed that the first broad public debate on establishing e-government held in the United States dates back to the early 1990s. At first, due to the information society theory, the subject issue was debated heatedly by the scientific community, after which the discussion moved to mass media and its outcome was recorded in the legal texts.

Canada was one of the first countries to innovate its e-government, in particular addressing the problem of public access to government information [92]. As early as in 1994, the country's government proposed a project of providing government services by IT means, under a conventional international name of "E-government".

Having divided the project into three implementation stages, Canada set the task of building an e-government system within five years. As a result of applying the modular principle, the system was divided into four circuits: the Site of Canada providing access to the context; information portal incorporating several subportals; middleware, which comprises search engine systems, a business process automation system, application and data integration systems; infrastructure software that consists of a paper and e-data management system, e-storages, and database management system (DBMS). At present, as part of the project implementation work, the Canadian government is working directly with the public, using the most powerful information portal that combines 500 websites.

Following Canada, Singapore and the USA took the lead in e-government development. It is these three countries that are distinct in creating the largest number of government web-services (systems for e-payments, filing tax returns, conducting polls, etc.) and their interface, well-designed in terms of user-friendliness.

Today, there are two global approaches to creating government web-services – central, which is based on the "top-down" principle, and a meta-system built on a "bottom up" basis.

For example, the government web-service of the UK is a centralized online resource built under the "top down"scheme. Its goal is to integrate the Internet services of all the authorities to provide administrative

services within a single information space. Government web-service is a combination of its own services and gateways, and is the only responsibility center for service delivery to applicants.

The USA applies a different approach to developing its federal web-service. The US federal web-service is built on the "bottom up" meta-system principle. Since regional and local authorities had developed their systems for providing administrative services using ICT before the federal web-service was introduced, the aim of the meta-system was forming a kind of administrative services meta-database. All information on the federal web-service is divided into four groups, intended for: citizens, businesses, civil servants, guests of the country. The online resource itself is the only functional center, providing the opportunity for its visitors to search for and get information on administrative service procedures and additional services.

Besides, there is an international practice of administrative services systematization on different grounds. For example, in the USA, the United Kingdom, France, and Belgium, administrative services are grouped according to the main population categories of service users (children, youth, seniors, veterans, entrepreneurs, foreigners, etc.). In Portugal and Canada, systematization of services is done by levels of government (federal, regional, or local).

In 2000, the EU leaders set a goal to create the world's most competitive and dynamic economy and announced their ten-year plan of economic reform (the Lisbon strategy) and the "Electronic Europe"programme of action based on the use of the network economy potential. Since then, one of the prerequisites for Ukraine's joining the EU is a steady growth of its information infrastructure.

The European approach to e-state development relies heavily on the basic principles of the macroeconomic policy of the EU member states in the field of forming an information society, as declared by the "Electronic Europe" programme, namely:

– promoting public access to modern ICT by creation of accessing centers;

– diversifying social e-services and improving their accessibility;

– introduction of information society technologies into the state system of training and retraining;

– conducting research on social effects of the ICT expansion and possible adaptation of all categories of citizens to the new conditions of life;

– raising public awareness of ICT (public authorities should take the lead in the ICT use in their activity, accelerating the society's information development);

– facilitation of information system standardization to ensure networks and network interactive services compatibility;

– control over elaboration of the relevant legislation and providing legal guarantees for citizens and businesses.

It should be emphasized that this programme does not preclude

creation of the national e-governments, and such projects are now implemented in the UK, Germany, France, Portugal, Estonia and some other states.

In France, creation of e-government was proclaimed as one of the priorities in the action programme to prepare for the country's joining the information society. The primary objective of the programme was to open up a universal access to public services and documents by the end of 2000. Later on measures were taken to provide a high-speed access to the Internet.

Under this programme, all the French ministries developed projects of websites containing complete information about their work and services. As a result, today everyone who is interested can get free access to this information. It is important to note that in 2000 the French government sites were reputed to be the best in Europe. Along with this, by 2000 all ministries and other government agencies got their e-addresses, thus establishing contact with the people via e-mail. Nowadays, when the activities of the government and ministries in France are in full view of Internet users, accountability and efficiency of the French officials has increased significantly.

In addition, the country pays much attention to computer literacy of both the population and civil servants. To solve this problem, special programmes were arranged to train officials and the public to work on computers and in the Internet.

Modern administrative reforms have given rise to many new approaches to organization of the public administration system in connection with rethinking of the role of the state in the life of the society, public sector's commercialization and mangerialization, a functional transformation of the government structure etc.

The problem is that the e-government implementation and use often do not produce significant results in terms of improving the functional capacity of the state. The essence of the problem, as one might expect, lies in excessive technologization of e-government establishment, which follows a classic scenario of informatization and automation of the existing bureaucratic procedures. However, under the conditions when bureaucratic procedures are ineffective, their transfer to the Internet space is intrinsically unable to increase the efficiency of public administration. Rather, the opposite result is obtained due to high costs of introduction and use of quite expensive e-government technologies.

It is getting evident that without a broad administrative reform aimed at improving the functioning of the state apparatus, the introduction of e-government will be ineffective and likely to be reduced to longtime and unsuccessful attempts.

The problem is in the lack of a general theoretical paradigm that could provide consistency and continuity of administrative reform and effective integration of e-government in the process of reformative transformation of the public administration structure.

2.2. Mechanisms of e-governance

E-governance ensures the development of public administration bottom up as a permanent cognitive search for alternatives from a reflexive civil society and civil partnership system to a network public administration. This is related to a new type of personality of the individualized society, a representative of a knowledge society who can sell their subjectivity in a multilayer format of public administration. A new social culture of social participation is formed, expressed in emergence of network communities with specific interests, self-organized initiatives, new social movements and local communities.

The development of e-governance destroys traditional formats of public policy and reproduces network public policy and network public administration.

The network public administration is based on cognitive networking of diverse multi-level agents of the state and its counteragents to address public issues and policy development. The principles of network management are based on rejection of hierarchical control and change over to network control of the society built on openness, transparency and accessibility.

The concept of e-governance integrates and develops the mechanisms of e-government, e-democracy and open government. The mechanisms of e-governance can be divided into five groups of components: security mechanisms in the information space, e-interaction mechanisms, e-services mechanisms, mechanisms of e-democracy and open government (Fig. 2.3).

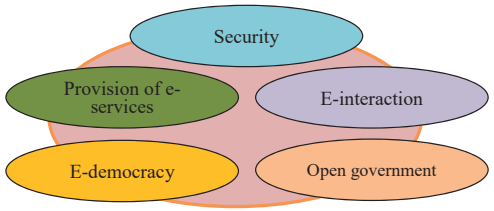

Fig. 2.3. Mechanisms of e-governance

The mechanisms of security in the information space are a technological foundation of e-governance, they protect citizens' access to e-services in the information space (Fig. 2.4).

Interaction between the components of any system is characterized, above all, by the concept of subjects' having access to objects. The subject may be a user or a process (a task, transaction, called up program or service), while the object – a logical or physical resource of a system, such as a file, data set, program, service, database, data link and the like. The basic characteristic of access is that it causes a flow of information from the object to the subject by such operations as read, write, modify, search and others.

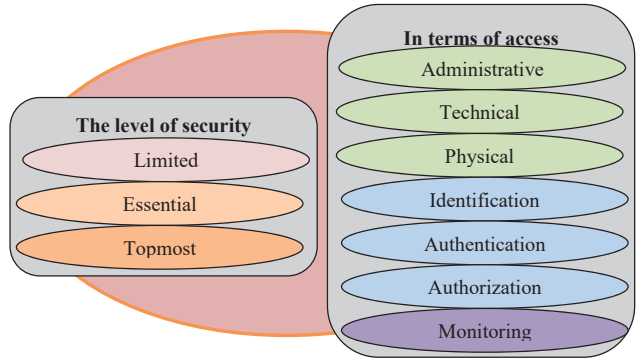

Fig. 2.4. The components of the mechanism of security in the information space

Access control is a key tool for security in the information space. Access control means can be classified [47] by security implementation levels, and security features – by the stages of work and components.

According to the implementation level, there are three categories of security means:

– administrative tools including policies, plans, procedures, measures determined by the security policies of an organization;

– technical security means – software or hardware, subsystems and information security services;

– physical protection facilities – physical barriers, screens and access control facilities.

Security means by the stages of work and components that implement the access control subsystem are divided into identification, authentication, authorization, and monitoring.

At the stage of identification, IDs of the system's subject and object are identified and checked. At the authentication stage, the authenticity of the subject is verified – whether it is the one who it claims to be. If a subject is authentic and has the appropriate rights to an object, it is authorized, i.e. access is granted to the requested object. Monitoring provides logging and analysis of security events.

Describing the access control systems, the following basic characteristics of an information security system are distinguished: confidentiality, integrity, accessibility, and accountability. The property of accountability implies that all events and actions of a subject in an information security system are identified, registered, and can be checked. The property of accountability is implemented through four procedures: identification, authentication, authorization, and audit.

Among the normative legal acts of the EU, which define the basic principles of the legislation on e-identification, above all, it is necessary to mention the EU Regulation 10/2014 of the European Parliament and the Council "On electronic identification and trust services for electronic transactions in the internal market" [68].

This Regulation aims to improve the security of e-transactions in the domestic market by providing a common framework for the safe and integrated e-interactions between businesses, citizens and public authorities, thereby increasing the efficiency of public and private online services, e-business and e-commerce in the EU.

The said Regulation makes a significant contribution to the construction of a single digital market by creating conditions for mutual cross-border recognition of key components, such as e-identification, e-documents, e-signatures and e-services, as well as compatibility of e-governance services in the territory of the European Union.

Introduction of the Regulation into the EU legal framework was imposed by the fact that in most cases the citizens can not use their e-identification for e-authentication in another member state, since the national e-identification schemes adopted in their country, are not recognized and not accepted in other member states. This electronic barrier prevents service providers from realizing all the benefits of the internal market. Mutually recognized and accepted means of e-identification should facilitate cross-border provision of e-services in the internal market and allow businesses and citizens to overcome the conventional digital borders without obstacles to interaction with public authorities of other countries [55].

The Regulation imposes requirements for compliance with the principles relating to the protection of personal data provided by Directive 95/46 / EC of the European Parliament and the Council. In this respect, when it comes to the principle of mutual recognition established by the Regulation, authentication for online services should apply to processing only the identification data that is adequate and reasonable to allow access to this online service. In addition, the requirements laid down in Directive 95/46 / EC on privacy and security of data processing must be fulfilled by providers and their supervisors.

Another important legal aspect, established by the Regulation, is that the member states retain the right to use and deploy these or other means of e-identification to access online services, deciding whether to involve the private sector in the provision of such facilities or not; have choice whether to report on all, some or none of the e-identification schemes used at the national level for access to public online services or special services.

The Regulation specifies the conditions, with regard to which e-identification means should be recognized and e-identification schemes announced. This is supposed to help member states to create the necessary level of security in relations with each other in terms of e-identification schemes, and mutually recognize and accept the means of e-identification within the scope of the schemes declared by the states.

Also, the principle of mutual recognition and acceptance is proclaimed, provided that a member state declaring (notifying of) an e-identification scheme complies with the notification terms and the notification is published in the Official Journal of the European Union. However, the principle of mutual recognition should apply only to authentication related to online services.

Access to these online services and their ultimate delivery to the customer should be based on the right to such services granted on the conditions, established by the national legislation.

A section of the Regulation having a special significance includes a requirement that the level of e-identification assurance should characterize the degree of security of e-identification means when identifying a person, thus providing assurance that the person identified, in fact, is the one for whom the identity was established. It is assumed that the level of assurance depends on the degree of confidence that the means of e-identification provide confirmation of the claimed identity or confirmation of a person's identity based on: processes (such as confirmation and check of personal identity, authentication), management activity (e.g. managing of an organization that provides e-identification means, or procedures for providing such means), and the technical control introduced.

In accordance with the European regulations, e-identification means in the context of e-identification scheme are divided according to three levels of security (assurance) and the appropriate mechanisms for their support as follows: limited (low), significant, and topmost (high).

Each assurance level must relate to the means of e-identification in the context of e-identification schemes that offer an adequate degree of security regarding the claimed identity of a person, which are characterized by the relevant technical specifications, standards and procedures associated with them, including the technical means of control, which aim to reduce the risk of abuse or substitution of identity.

Among other things, minimum specifications, standards and procedures for low, significant and topmost levels of assurance are set to be applied to e-identification means.

It is supposed that these minimum specifications, standards and procedures should be set with reference to reliability and quality in relation to: procedures of proof and verification of identity of persons or legal entities applied to issue e-identification means; a procedure for issuing the requested e-identification means; authentication process, in which a natural or legal person uses e-identification means to verify their identity before the party who trusts them; entities that issue e-identification means; any other agency that is involved in processing orders for issuance of e-identification means; technical and security specifications for the issued e-identification means.

It should be emphasized that the requirements must be technologically neutral, and the necessary safety requirements should be met due to application of various technologies.

One of the most important aspects of the international and European legal framework on e-identification is an approach to defining the architecture of managing e-identification services, functional requirements to information sharing and information security in the e-identification infrastructure.

We should also stress that the international standards and recommendations clearly define the range of subjects involved in e-identification infrastructures, describing their role and activities.

The analysis of the general state of e-identification infrastructure implementation in the EU member states gives evidence of heterogeneity of the adopted policies in this area, the use of different identification and authentication technologies according to the different levels of trust in e-identification. They can be grouped into the following main conceptual approaches [55]:

1. Means of identification and authentication, maximally simplified for end users of information system through the use of a "login – password" pair.

2. More reliable authentication means in the systems of providing online services based on variations of one-time passwords, generating them through lists, sending short text messages, and a special hardware and software password generator (OTP-tokens).

3. The most reliable authentication means in systems providing online services through the use of cryptographic transformations, that is the most reliable mechanisms of trust using EDS. These mechanisms are based on application and development of trust infrastructure, based on public key infrastructure (PKI), and use a variety of software and hardware means of e-identification. Hardware is implemented in versions of qualified e-signatures means (hardware token) and start-cards. Also, e-identification means are used based on SIM-cards for mobile authentication services (mobileID).

The architecture of e-identification infrastructure should provide for the use of several means of e-identification. This will promote expansion of e-identification-based services among citizens. In many European countries, several means of e-identification are available.

In some countries, not only the state but private institutions as well can act as e-identification issuer (e.g., BankID – an initiative of banks, PKI MobileID – joint initiative of operators, banks and key certification centers).

The mechanisms of e-interaction provide information interaction of government authorities in the e-form during administrative services delivery and performance of public functions (Fig. 2.5).

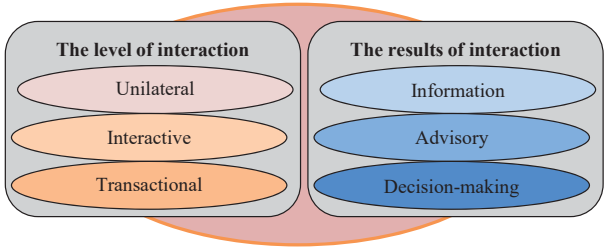

Fig. 2.5. Classification of e-interaction mechanisms

E-interaction can result in obtaining information, providing counseling, or making management decisions. In this regard, according to e-interaction results the mechanisms of e-interaction can be classified into e-information, advisory and decision-making.

The information mechanisms ensure obtaining the necessary data with the use of service tools of access to information registers, inventories, data of both general and special purpose.

The consultation mechanisms call for a mandatory request from a potential service recipient and a mandatory response from the entity providing the service in an arbitrary form, or in the form of a document. The consultation processes provide for both – a more open government and taking into account users' opinions. For this purpose, a consultation code is published with a provision on feedback.

The decision-making mechnisms provide for considering citizens' proposals and using them in public administration. The e-governments of advanced countries are integrated into a network information and communication infrastructure that goes beyond the strict institutional limits of public authorities and connects to network community resources, providing an effective representation of group interests and the impact of individual, collective and institutional civil structures on public decision-making.

The system of e-interaction is an infrastructure that comprises information databases, including information about the software and hardware used by authorities and organizations to provide access through e-services; information on tracing the movement of e-messages within the interaction system when providing administrative services and performing public functions in the e-form; as well as about software and hardware, providing interaction of the information systems of the authorities and organizations.

The main functions of the e-interaction system are [51]: keeping the register of e-services; conducting security policies that apply to registered e-services; routing messages in the registered e-services; logging requests (incoming and outgoing) for e-services; a guaranteed message delivery; providing notification of failures in e-service functioning; transmission of information about events to subscribers; forming dynamically generated statistics on the use of e-services.

The e-interaction system provides: interaction with citizens; interaction with business entities of different forms of ownership; cooperation with NGOs and inter-agency cooperation. For each of these types of interaction, requirements are established according to specific standardized specifications, which are to support (realize) a specific way of cross-system e-interaction.

Different ways of implementing e-cross-system interactions are distinguished, the main ones being: cross-system interaction using web-services; interactive communication using a web-browser; loading and unloading of files when performing browser interaction; interactive communication with the use of cryptoprotection modules or a digital signature; asynchronous exchange of information using e-mail and so on.

According to the level of interaction, the e-interaction mechanisms can be classified into one-way, interactive, and transactional.

The one-way (unilateral) e-interaction mechanisms ensure: informing the public about the activities of government agencies; providing information about legal framework of the authorities'activity; timely publication of official sources data; providing access to public information and open data; formation of reporting e-forms and assisting with the rules for their filling.

Implementation of such interaction is achieved by means of official websites and authorities' portals, the information resource of social networks, blogs, video conferencing, e-news delivery systems, mailing lists, inter-media, mobile telephony. The process of informing does not include any interactive action on behalf of administrative service recipients or submission of any documents.

The interactive (bilateral) mechanisms for e-interaction provide bilateral interaction of the government with the society by means of e-communications. In the course of online interaction a user can address a specific request to government agencies and get a concrete answer about their problems. [39]

E-governance-based interactivity gets citizens involved in the network public space and focuses public management system on policy development, due to: a) analysis of policy development that suits the interests of main influential community groups; b) the practice of horizontal consultations and public dialogue to select an optimal solution under the circumstances; c) a mandatory evaluation of decision effects for the society as a whole [8].

As a result, the resources of civic initiatives, formed in a network online space, get involved in public policy formation and control over its implementation. Public interactive communication expands the institutional capacity of citizen participation in decision-making. Thus interactive communication changes the quality of public policy space, offering different versions of citizens' active participation in public decision-making.

Interactivity includes a diversity of public participation technologies, implemented at different stages of the cycle of public policy, involving not only technological ways to get the feedback from community groups, online communities, and individual actors in the online public policy space, but also promoting institutionalization of various forms of cooperation and partnership of different sectors [52].

It is not characteristic of the e-governance system interactivity to present public authorities and public management bodies distinctively. They are scattered in a network online public policy space, being tied selectively to state-designed or self-organized network communities of citizens, forming nodes of social reflection and networking communication platforms. They allow, without revolutionary eruptions or upheavals, to gradually redistribute power authority for the benefit of the society and pass a number of regulatory functions to its political, economic, social and other institutional self-organized structures, thus providing opportunities to overcome evolutionarily the conservatism of public authorities in organization of their activities and interaction with citizens and their associations [16].

In the online space, the state takes the form of a coordination structure that integrates and regulates network communities, expanding and differentiating them on the basis of the universal social values to solve socially significant and specific problems of different levels. This public policy is a product of joint activities of various actors on the principles of dialogue, cooperation and partnership.

Interactive technology of e-governance could be the basis for block institutional changes, the essence of which is to build a strategy for the transformation of public administration as a consistent increment in constructive institutional capital. It is referred to socializing institutional construction [7], based on the process of including various structures of civil society into formation of institutional design. Interactive communication of network public administration combined with public demand for the network self-organization and participation in monitoring democracy can become a transformational institutional matrix that will contribute to the qualitative development of public policy. The problem of the state in the presence of political will of its leadership lies in coordination of conflicting and multi-structured formal and informal political practices of social networking and institutional development of public policy in a given direction.

Thus, interactive mechanisms of network public administration correspond to the principles and methods of the ICT-based network interaction of authorities and citizens in the online space of public policy in developing and making public decisions. They serve as public mechanisms for incorporation of social networks, self-organized or state-designed for public authorities and management.

The transactional mechanisms of e-interaction provide access to specific natural or legal persons only after they meet the relevant requirements in terms of identification and authentication and subsequent realization of online operations (transactions) of e-service delivery. Transactional services can not be used without preliminary authentication, since service delivery is connected with processing of individual and unique information. Carrying out online operations (transactions) involves an active connection with e-confirmation of requests between an authorized organization (public or private) and service destination. This includes submission of applications in the e-form to obtain licenses to engage in certain activities; submission of a tax declaration; applications for sharing documents; conducting financial transactions for services [39].

The mechanisms of providing e-services are the key constituents of the e-government system. They can be classified by their components into administrative, institutional, integrative, service (Fig. 2.6).

Administrative mechanisms for providing e-services are based on application of e-administrative regulations, processes, procedures, functions, and their information maps and implementation sheets. The introduction of e-administrative regulations is an innovative process, a new approach to analysis of the administrative processes structure, and search for new models of government structures' functioning.

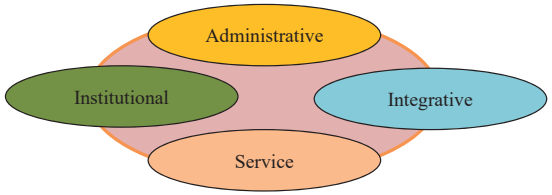

Fig. 2.6. The set of mechanisms for e-service delivery

The electronic form of administrative regulations makes it possible to improve the quality of public performance and administrative service delivery, reducing operating costs, shortening decision-making time, and ensuring their information validity.

Implementation of administrative e-regulations will allow for a phased sequential automation of processes of administrative services delivery to the extent of complete exclusion of public authorities from participation in some simple administrative processes.

Administrative regulations are a basis for both setting indicators of authorities' performance and developing public services standards.

Implementation of the administrative mechanisms consists in designing and building of e-government architecture, selection of specific technologies that provide, for example, e-document flow or automation of business procedures.

The institutional mechanisms for providing e-services involve modernization of public administration at all levels: national, regional, and local-government. The institutional infrastructure of e-services includes: bodies providing public services at all levels (single registration window, centers for administrative services, entities providing services, state portal of administrative services, state information resources, etc.); public key infrastructure; telecommunication service providers, etc.

The problem of institutional adaptation is primarily related to management optimization, establishment of a government body responsible for transition to e-government, formation of a regulatory framework, etc. The institutional adaptation is a complex social process, accompanied by negotiations, conflicts, and struggle of decision-makers in bureaucratic structures of different levels, which makes its outcome hard to predict.

The institutional adaptation also includes individual adaptation of employees to providing e-services. Advantages of ICT may well be perceived by these employees as personal threats (not to mention the need to develop a new, complex set of skills). For them, increased efficiency and reduced costs means cutting of budget funding, downsizing, loss of influence and so on.

That is why the institutional adaptation is usually of differentiated nature and constitutes the unity of assimilation (adaptation of existing structures to the technological and organizational requirements related to the functioning of ICT) and accommodation (adaptation of ICT to the

needs of sustainable reproduction of bureaucratic structures), with an obvious advantage of the accommodation [33].

Moreover, the practice shows that 35% of projects in the field of e-government by no means work; while another 50% work only partially (main goals are not achieved or achieving them brings about unexpected negative consequences). Attempts to introduce new systems without regard to the institutional context will in any case lead to compromises and emergence of hybrids, but they will be extremely costly. Conversely, when this kind of compromise is planned in advance, the results are more effective. Decisions in the field of e-government should not be borrowed, no matter how successful they may seem, but rather specifically adapted to the existing institutional systems.

Transition to e-services is not a technological process, but a social one with a distinct cultural component. The stability of the national bureaucratic culture, oriented to support the regime of secrecy and lack of decision transparency, leads to the situation when laws, developed within that context, become inoperable. For the laws to take effect, they must be adapted to the current institutional system.

Introduction of the integrative mechanisms for e-services improves the quality of service delivery and shortens the procedures for obtaining public services. These mechanisms are based on the implementation of a single window principle in public service delivery, which excludes or maximally limits applicants' (individuals', legal entities', etc.) participation in the process of collecting a bulk of documents and certificates from different institutions and submitting them to other agencies, confirming the applicants' rights for services. Therefore, introduction of the integrative e-interaction mechanisms plays a special role in transforming the service delivery work of authorities and organizations.

Thus, for a quality modernization of administrative service delivery, it is necessary to integrate information systems, a network of service-providing centers and entities, government and departmental information resources and registers within a single system of interdepartmental e-interaction.

At present, several types of integration are distinguished, namely: information-oriented, service-oriented, and process-oriented integration [89].

The information-oriented integration is used primarily when there is a need for information exchange among multiple information systems. This type of integration is the simplest and less costly compared to other types because data is simply transferred from one system to another by conversion into the desired format. The information-oriented integration usually uses message brokers, linking software, servers of database replication that ensure bringing the e-table data of two databases into an identical condition, and other technologies aimed at sharing information among multiple systems. What makes the information-oriented integration popular is primarily a widespread occurrence of software that is based on relational databases and the relevant standards.

The service-oriented integration is used in cases where there is a need to use both data and functions of the integrated systems. Here the systems can share the functions of one another. This integration principle consists in using the features of legacy systems rather than create new services – there is no need to create special services for different information systems.

A current trend of this technology is the use of web-services and the universal standard for data submission, e.g. XML. In general, this type of integration technology is based on service-oriented architecture of information systems and uses technologies that integrate systems by means of services rather than writing software codes. This architecture implies the existence of three main components: a service provider, service consumer, and service registry. A scheme of component interaction is as follows: a service provider registers its services in the registry, and a user addresses a request to the registry. Web-services operate on a standard interface irrespective of the type of platform or programming language. This suggests that the technology of service-oriented integration is independent of the information system designers.

The process-oriented integration involves the use of internal business processes of different information systems, within a supersystem created to integrate all other systems. The process-oriented integration is used in the most difficult cases of integration when it is necessary to link a large number of heterogenuous information systems, while using their functions. The essence of this type of integration lies in enabling arbitrary data transmission from one information system to another due to activation of a specialized metaprocess. The technologies of process-oriented and service-oriented integration should be used only for a proven necessity, as they both require a transformation of the internal functions of the integrated systems and are quite expensive. In the long run, a process-oriented integration is required when linking a large number of systems with a varying degree of business process automation.

Apart from the main types of information systems integration, there are several integration levels [89]:

1. Integration of business processes, based on the definition, implementation and management of information exchange among different systems. This approach allows improving operations and optimizing costs of using information systems. Its elements include process management, process modeling and workflow encompassing a variety of tasks, procedures, architectures, requirements for incoming and outgoing information, and step-by-step division of business processes.

2. Integration of applications is done by combining a system's data or functions with those of another system. A transfer of functions or data inherent in an application, to another application is used with a view that their interaction on the performing stage should provide fulfillment of an applied function of an information system.

3. Data integration is based on data identification and cataloguing

for future use. A successful integration of business processes and applications at the two previous levels depends on how well the data from different database sources is integrated into the system. At this level, it is necessary to identify and catalogue data, and build a model of metadata.

4. Standard-based integration relies on the use of standard data formats (e.g., XML). To ensure data integration, standard data formats are to be selected. The integration standards are formats supporting the use and dissemination of information and data for integration of interdepartmental applications.

5. Platform integration addresses the processes and tools, by which the system can perform a safe and optimal information exchange.

The most common methods for integration of interdepartmental interaction are file-based exchange, data replication, web-services technology, service-oriented architecture, integrative servers.

The most common way of integration is file exchange. In terms of implementation, is the easiest way, although having its drawbacks. In case of exchange of complex structures, it is necessary to develop specialized file formats which leads to a high system dependence. Also, exchange of files needs a person who swapps the files in and out.

The process of data replication is based on the concepts of 'publisher' and 'subscriber'. The publisher is a publication server that sends information. The subscriber is, respectively, a receiving or subscription server. For convenience, replications can be divided into two broad categories: data replication in the inter-server space, and replication of data between the server and clients.

A service-oriented architecture is most common to the system of interdepartmental interaction. The system is a set of software components – services with standard interfaces to access them over the network and to use them. The architecture interfaces are independent of service deployment platforms and their implementation technology. The architecture provides a common scheme of service interaction, regardless of where a service is located.

Problems of data integration can be considered at a slightly different angle. There are two mechanisms of data submission: syntactic and semantic. Most of the modern integration solutions are based on syntactic submission of data. Under this approach, a developer relies on the external similarity of data, while the semantic concept is based on the similarity of content.

The integration problems are not merely technical – it is not difficult to combine different relational databases; however, it is more complicated to integrate the data coming from sources that have different models or even worse, different semantics i.e. interpret the same data differently. For the automation of data processing, the semantics must be distinct and in-built in the data, so that the data contain descriptions of its own semantics. This can be compared with the way people summarize data in their daily lives, basing on their understanding of the world, the semantics of which is familiar.

A semantic integration is complementary to rather than replacing the standard methods. Nevertheless, it fills a critical gap by rendering data and its inter-linkages the missing usability.

In the past few years, there appeared a number of specific standards and tools to support the semantic integration. However, one of the important achievements is the possibility of creating an abstract semantic model. This provides unprecedented advantages: a possibility of abstracting management and system support under user control in an automatic mode; referring to various administrative processes through the same abstract level of management.

In summation, it is possible to point out the following advantages of the semantic integration mechanism: data structure is focused on the relationship between data units regardless of the similarity of their representation form; data is linked on the basis of a common ontology definition; the system is less bound to apply exchange standards, which results in increased scalability.

The service mechanisms of e-services are related to the efficiency of detection, modeling, and meeting the individual and group interests and needs of citizens. For a service organization of management, the dominant performance indicator is customer satisfaction with services. The service approach determines development of the network forms of management interaction, communication technologies of control and planning, and online services development.

The essence of the service approach is to consider the elements of a system as a set of service mechanisms for [43]:

– submission of documents and getting a service result from a center for administrative services on the single window principle;

– providing administrative services in the e-form as a fundamental element in creating a new model of public administration;

– obtaining of administrative services timely and in accordance with the appropriate standards;

– obtaining complete, relevant and reliable information on administrative services delivery, including in the e-form;

– provision of administrative services by authorities in accordance with administrative regulations;

– providing administrative services according to the administrative service registry;

– access to copying and filling in the e-form of requests and other documents necessary for administrative services;

– access of the applicant through online technology to the process and result of administrative services;

– a possibility of paying state duty for provision of administrative services in an easy form, including remotedly in the e-form;

– using e-ID card as a document that certifies a citizen's identity, and confirms their right to obtain administrative and other services;

– introduction of the conceptual principles of using service technologies.

An active implementation of the service mechanisms for public administration and interaction of citizens with public authorities is accompanied by a simultaneous automation of administrative regulations and introduction of official e-documents. The need for such innovative public management mechanisms is caused by an objectively impossible realization of the service state concept through traditional management technologies, characterized by high time and economic expenditures, and corruption risks.

Thus, the conducted research has made it possible to determine a system of mechanisms for e-government development that comprises five groups: security mechanisms in the information space; e-interaction mechanisms; e-services mechanisms; mechanisms of e-democracy, and those of open government. For each group, a detailed classification of e-government mechanisms is provided. A characteristic feature of the presented structure of mechanisms is their interrelationship, which determines a systemic and comprehensive approach to e-governance introduction.

2.3. Mechanisms of e-democracy

In today's society, new forms of the socio-political structure emerge based on electronic means of mass communication, and the relationship of government institutions and civil society. The state ceases to be the sole subject of political process, as e-technologies allow citizens to gradually expand their influence, turning citizens into political activity subjects.

Arguably, e-communications, in the course of their development and spreading in a society, are able to transform essentially its political structure and the very nature of political relations, contributing, first and foremost, to democratization of political institutions. In particular, many researchers support the most urgent idea of using e-communication as a basis for democratization of the socio-political system, and a model of relations between the government and the society, formation of a new social interface of the state and authorities in the eyes of the general public.

Defining e-democracy as a socio-political system, in which interactions are maximally informatized, one should recognize its greater, compared to other models of political democracy, proximity to the participatory democracy ideal, since e-democracy allows common people to participate in discussion and adoption of social and political decisions using e-communication means. At the same time, e-democracy can be regarded not only as a social and political system, but rather as a set of mechanisms, e-communications used in the interest of optimizing the relationship between the government and the society, expanding the space for social and political communication between the state and its citizens, and further democratization due to a more extensive public participation in political life [37].

Thus, e-democracy should be regarded as a mechanism for social and political communication of the authorities and society that best matches the needs of a modern information society. E-democracy stimulates civil social activity, as citizens have the opportunity to discuss online the most pressing issues that affect their lives and the country. In other words, one of the distinguishing features of e-democracy is its focus on the citizen initiative.

Due to a wide use of ICT, e-democracy provides a qualitatively new level of citizens' interaction with one another, with public authorities, local goverments, NGOs, and business entities.

In most democratic countries, the development of democracy, including its key institutions, is based not only and not so much on power authorities, but on civil society. In this regard, the urgent task is finding and implementing mechanisms that improve citizens' activity in public life.

The experience of countries that make serious investments in democratic development proves that the spreading of ICT is one of the key factors that directly influence the development of democratic institutions. For the most part this is due to the fact that ICT greatly extend the social and political activities of citizens. For example, a bilateral interactive e-communication of citizens with authorities in obtaining various services significantly reduces time consumption, transportation and other material costs of citizens.

An active development of e-democracy requires [45]:

– a clearly marked state vector towards strengthening democratic institutions – the state should allocate significant resources to develop civil society and support numerous community organizations;

– implementation of various Internet projects to protect the rights and freedoms of citizens and maintain their communications with the authorities and socio-political organizations;

– development of public and private programs for informatization of the system of social relations in business, medicine, education, science, culture and public administration;

– introduction of interactive (bilateral) e-communication of citizens with the authorities on social and political issues;

– promoting the procedures of identification and authentication of information exchange participants, including those of practical implementation;

– popularization of effective e-democracy measures among the population, forming the environment of trust in these activities.

The development of e-democracy should be implemented at the national level, involving representatives of civil organizations, NGOs, experts, public authorities, local governments, mass media and private companies.

An active implementation of e-democracy at all levels of government and civic participation will contribute to drawing together of the government and the society, strengthening of citizens' participation in the public sector and making public policy decisions, which will make

governments more accessible and open to the public, create additional incentives for development of a partnership model of interaction between the government and civil society.

The mechanisms of e-democracy development are as follows: network communication; e-voting; inquiries and requests; e-petitions; network crowdsourcing; online evaluation; e-participation; building online communities; automated monitoring (Fig. 2.7).

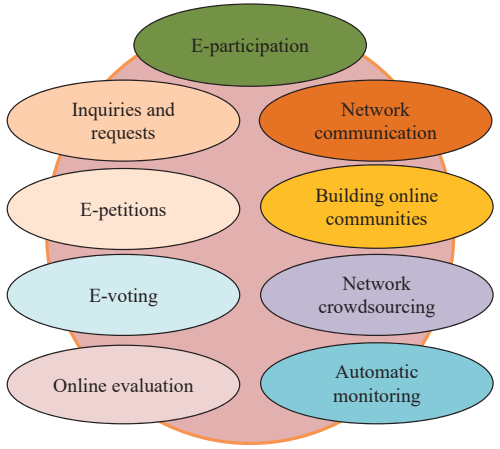

Fig. 2.7. Mechanisms of e-democracy

The network communication mechanisms provide communication between citizens as to discussion of socially significant problems and socio-political issues, and between citizens and the authorities, including the instruments of influence on decision-making and public control over the authorities [45].

E-communication of citizens allows organizing mass public debate among geographically remote independent participants in the real time mode. Such a discussion can be organized successfully via specialized online resources (forums, online conferences, webinars, skype-sessions, etc.) on the site of practically any social network, and through blogging.

Recently, around the world, a host of specialized Internet resources have emerged where communication between users is meaningful, focusing on discussion of the housing sector, construction, education, culture, medicine and other issues.

The basic mechanisms of network communication of citizens are raising issues, exchanging remarks, comments and even files, links to materials published on foreign resources, and discussion of these materials, debating, etc. This network communication can be organized on different principles. First, the communication can be either public or available only to a particular circle of users. Secondly, communication can be completely free or moderated by a third party or parties (e.g., an Internet-resource administrator) according to a set of formal and informal rules.

However, there is often a need for internal moderation, as during discussions users can clash and appeal to certain general rules and regulations of network communication, search for an arbitrator who is able to resolve their dispute. That is why in the network communication space a demand arises for mechanisms regulating communication relations, similar to those operating in the ordinary physical-space interpersonal communication.

Conducting collective online discussions or arrangement of events via e-communication is not the end goal of e-democracy, as the absence of response from socio-political decision-makers of various levels turns the above elements impractical, i.e. useless. This means that alongside with creating technical and technological capabilities for e-democracy, it is necessary to develop communications that would allow citizens to exercise a real, not declarative, impact on the socio-political process (network communication with public authorities). By the consolidation principle, this communication is divided into e-appeals and requests of citizens, and a formed collective position (e.g. e-petitions).

Collective appeals express a consolidated opinion of users as to the issues discussed. A consolidated opinion is a useful result of networking, one of the major elements, on which e-democracy is based.

The issue of forming a consolidated opinion during collective online discussions is that the discussion involves users whose starting positions may differ because of their different social status, profession, age, place of residence, religious or political affiliation and so on. In addition, being receptive to the idea of problem importance, they can have quite dissimilar views about the remedies. All these factors often nullify any efforts to promote formation of consolidated positions, including those in the collective appeal format [45].

The theory of collective action offers many models of collective decision-making. One of the most common models is the one, in which a small working group stands out within a community. That small group prepares a draft collective decision and sets it forth for an open public commenting and evaluation. After collecting the comments, proposals and evaluations, and analysis of discussions unfolded through online communication on the decision worth, the working group finalizes the draft collective decision making corrections in it.

Then, the second discussion of the draft can begin, or the decision is approved as final and sent to the organizations concerned. Also, the mechanism of e-voting on a draft collective decision can be applied, using the model of relative or qualified majority. The e-democracy system services allow combining the bulk of citizens' applications in a collective appeal, which significantly saves labor consumption of public servants and local government officials working with public appeals.

As we can see, the unified e-democracy system's benefit lies in its ability to consolidate and transform the varying opinions of site panelists on socially significant issues into consensus proposals to be addressed to the competent authorities. Also, through an e-democracy platform, the authorities may carry out their own strategies of working

with the public, in particular posting ads, issuing email newsletters at user addresses, posting responses to citizens' appeals, conducting public surveys, etc.

It is worth noting that the modern models of e-democracy, apart from affording ground for the ordinary public to express their views on certain socially significant issues and participate in online panel discussions or voting, also provide a real opportunity for citizens to have a dialogue with the authorities, political parties and other public organizations, and local governments.

Besides collective e-mail appeals to the authorities at the e-mail address of a competent agency or a particular official, there are resources allowing citizens to make an appointment with an official, participate in online conferences or Skype sessions with the authorities in a real-time mode, put questions to officials, and inform them about the problems of a particular yard, district, city, village, or region. In most cases, these possibilities are provided by online receptions, implemented in web-resources of some government agencies.

An objective evaluation of an effective network dialogue with authorities allows admitting the fact that this communication copes with its tasks quite efficiently, so far as the political and legal system established in a particular state permits.

Among these communications, there is a problematic communication of network monitoring of public authorities' and local governments' activity, providing a constant monitoring of not only unsolved housing, utilities, education, healthcare, and other problems, and informing the authorities about these issues through e-technologies, but also the very procedure of developing and implementing the government decisions made with participation of citizens.

In democratic countries, this monitoring is usually carried out by means of: a) directive instructions for authorities to place in the public domain full information about their activities in the form of e-documents; b) online broadcasting of government meetings and conferences; c) legally prescribed requests from natural and legal persons for information about the authorities' activity. The introduction of such communications is of prime importance, along with e-administrative service delivery to individuals and organizations.

An essential mechanism for monitoring the authorities' activity is online evaluation. It must be emphasized that e-surveys, evaluations, ratings, and expertise along with e-voting are an important part of any e-democracy model.

The mechanism of e-voting is a universal attribute of e-democracy used not only for arranging elections and referenda, but as part of online surveys, online public examinations and other procedures, which take into account the collective position of e-democracy system users.

E-voting has long been used in many countries almost on all levels of their social and political organization. This kind of communication allows not only minimizing the negative influence of the human factor, but also reducing estimably the voting costs. The online voting gives a

considerable resource-saving not only for voting organizers, but also for all other process participants: candidates, voters, observers and others. In particular, voters do not have to spend time visiting the polling station, paying transportation costs.

However, e-technologies can be used as a means of election fraud; for another thing, serious failures in the operation of the automated e-voting systems can not be excluded either. Therefore, it is essential, when implementing e-voting, to develop both the voting and counting procedures, and voting results control and verification procedures. Certainly, the key e-voting problem remains digital identification of citizens, who are e-democracy system users. To a large extent, this problem is a major obstacle to a widespread introduction of e-voting at the election of state and local authorities [45].

The foreign practice of using different e-voting methods has revealed common ways to violate the electoral rights of citizens using this procedure. The following e-voting risks can be mentioned: inadequate confidentiality of voting due to a mandatory identification of voters and preservation of the evidential force of information about their expressed will; interference in the e-vote counting systems, and the associated need to provide inalterability of information about will expression; difficulty of surveillance and monitoring of e-voting procedure on behalf of the direct participants of election campaigns and the public.

Quite often the problems encountered during e-voting, not only cause debates among professionals and the public, but even lead to court action.

There are four major components of e-voting success: liberalized public access to the Internet; availability of a state structure providing online voting; an effective system of voters' e-identification; high level of political culture that supports and provides Internet-voting.

Just like in a traditional voting system, within the framework of e-voting, the principles of democratic elections and referenda should be observed, providing for reliability and security. It is noteworthy that this fundamental idea encompasses all electoral issues related to the e-voting system. It is critically important to place demands for the system transparency, accountability, the possibility of checking its compliance with international standards and recommendations. E-voting systems should be open to independent verification and easily accessible to voters.

However, most of the technological solutions of e-voting actually does not ensure transparency of voting, as due to the e-voting system's complexity and closed nature, meant to protect it against interventions, common citizens and observers can not make sure that their votes were adequately taken and processed. That is why the clear indicators for observers should be built in during the system development.

In this respect, we should emphasize the following points [20]:

– for security and reliability reasons, an e-voting system must have a high degree of autonomy and isolation, to minimize a possible impact on the election results from the outside;

– a special role within the system of e-voting is played by multidimensionality of e-voting, namely the relationship between its legal, operational, and technical components which should be considered when developing an optimal concept of legal regulation.

Consequently, it is assumed that organizational, technical, technological, economic, operational and other components constitute a single block of problems that require a comprehensive constitutional and legal evaluation, as e-voting must comply with the basic principles of elections and the requirements to them.

The principle of free suffrage means that the voting procedure should take place without violence, coercion, pressure, manipulations or any other influence on voters that can bias their choice.

According to this principle, the Committee of Ministers of the Council of Europe issued its recommendations for e-voting systems:

– organization of e-voting should provide free formation and expression of the voter's opinion and personal exercising of their vote;

– e-voting system should be constructed so as to prevent emotional, unconscious, or impetuous voting;

– within the system of Internet-voting, voters should be able to change their vote at any time before making a decision or suspend (postpone) the voting process. In this case, the voting information should not be made available to other voters or third parties;

– e-voting system must exclude any impact on voters during the voting;

– e-voting system should provide voters with the opportunity to vote in the same way as in the traditional system of voting, e.g. leaving a ballot blank;

– e-voting system should clearly inform a voter of successful voting and the completion of voting;

– e-voting system should prevent a change of election results by warning voters that the voting has been completed.

Unlike a traditional voting procedure at the polling station, where the voting process can be watched and the outside influence can be generally detected, online voting does not provide such an opportunity. The so-called "family voting", which discords with the principle of free suffrage, can pose a serious problem.

In fact, observation of principles directly depends on the legal consciousness, civic engagement, and sense of civic duty of every individual voter, and therefore the introduction of Internet-voting requires a high level of legal and democratic culture of voters in each particular country, their awareness of the political and legal meaning of the procedures, and responsibility for the fulfillment of their civic duty and the requirements of the law [20].

It is also important to note that generally non-observation of these principles by the voter does not incur any legal liability and no legal measures are implemented. It means that in this case the voter has positive responsibility, and observation of the law is dependent rather on the level of legal awareness and legal culture than on fear of prosecution.

The mechanism of e-applications and e-inqueries is one of the most important mechanisms providing law and discipline, and regulation of the relations between citizens and authorities. This mechanism ensures the right of citizens to make appeals and requests to public authorities and local government bodies, management of companies, organizations, institutions of different ownership.

Appeals and requests relate to various activities of society and the state, but mostly they have one goal – to draw attention of the competent authorities and officials to solving the problems that affect the interests of the society or individuals. As information media, they are essential for addressing the issues related to protection of human and civil rights and freedoms, national, social and cultural development, management of different sectors of the economy, administrative and political activities [46].

E-applications and e-requests from individuals and organizations to the authorities in the e-form have not become widespread due to lack of the necessary and sufficient procedures that would guarantee legally and ensure practically a full equality of data applications and procedures to their physical analogues. Another major problem is identification and authentication of information exchange participants, specifically in terms of implementation. The negative factors also include the lack of effective tools for popularization of e-democracy among the population. Without keeping the citizens informed about the opportunities of e-democracy, it is impossible to create an environment of trust in these tools.

A form of appeal to public authorities is submission of petitions, collective appeals, which must be signed by a certain number of citizens and supplemented with their specific suggestions or demands. One of the modern types of appeals is an e-petition.

The mechanism of e-petitions provides for a special kind of collective appeal, addressed to a certain range of recipients, who have to gain support from a specific number of people within a limited timeframe, and is to be considered and implemented in a prescribed order. In the world practice, this form of collective appeal is widely used, involving a special procedure for recipient to respond. E-petitions are a proven effective mechanism for a systemic social dialogue.

With introduction of e-petitions, citizens will have a new tool of communication with public authorities and local governments helping to resolve important social issues. E-petitions may also be a form of effective democratic pressure on the government. At the level of local communities, petitions serve local councils focusing on local problems and finding solutions. E-petitions may replace various sociological polls of dubious origin.

The form of e-petition has a number of advantages over its paper analogues, namely: convenience and accessibility for citizens; free-of-charge basis; minimized manipulation with the number of signors, and ruling out forgery of signatures due to the process of personal verification for petition support; a special status of the appeal and the

opportunity to be heard by the highest authorities and officials of the state and local governments.

E-petitions are aimed to form a new tool for communication of citizens with the public administration, providing an opportunity to respond quickly to changes and challenges arising in the society. Despite some likelihood of abuse and discrediting of this tool, e-petitions are able to play a positive role in establishing public dialogue with the authorities. Thus, every petition that gets a required number of votes needs a detailed analysis and exhaustive answers regarding the feasibility, effeciency and economic results of decisions made [71].

The network crowdsourcing mechanism is a mechanism of transferring a job, traditionally done by a designated worker, to an indefinite, usually large, group of people in the form of an open appeal. Crowdsourcing appeared at the intersection of such phenomena as PR, contesting, e-communication, collective intelligence, dialogue, savings, mutual aid, etc. It is based on the assumption that there are always talented people in a society who are ready for free or for a nominal fee to generate ideas, solve problems, and even research for the sake of corporate or public benefit, their main incentive being a chance to realize their ideas rather than get a reward.

Crowdsourcing marks the latest approach to the methodology of solving problems of any complexity and any character by using the wisdom of millions of people. The essence of crowdsourcing is in solving a very clearly formulated problem by getting a maximum number of concerned people involved.

The significance of crowdsourcing lies in the fact that it offers unprecedented opportunities for civil participation. People have got a tool that allows them to self-organize quickly and economically, create partnerships and coalitions, join the network for their specific goals. Certainly, it has major political implications, including potential changes in a dialogue between the government and society. The state is watching carefully, trying to learn the new rules too. Crowdsourcing is now used to solve political problems all over the world.

Therefore, the network crowdsourcing communication is not only about arranging a forum, in which participants formulate in a deregulated way their questions, comments and suggestions; neither is it an unconventional feedback tool, but an organizationally and methodologically structured model of a dialogue interaction between an institution and self-motivated Internet users. The model realization involves formation and implementation of such administrative processes as formulating topics to be discussed; determining of the discussion terms; inviting and motivating experts; selecting and filtering ideas; and documenting discussion results [74].

The topicality of the application of network crowdsourcing communications in public management is associated with the development of modern ICT, social networks and various interactive Internet sites. Crowdsourcing allows public authorities to make better management decisions based on the opinions, demands, suggestions

of the people through getting them involved in solution of problems affecting their interests, and providing opportunities to offer their ideas, discuss and evaluate proposals. The crowdsourcing technology changes when citizens' opinions are used to update regulatory acts, enabling a transition from a simple practice of commenting to active involvement of citizens in drafting regulatory texts.

An effective use of crowdsourcing in public management is based on openness and transparency, which allows authorities to involve citizens in the work on changing the life of their regions.

For all the obvious advantages of crowdsourcing, its implementation in the public sector will not be viable, unless a number of necessary conditions are observed, the neglect of which may threaten a new management tool with defamation, namely [74]:

– crowdsourcing should not be transformed into a political campaign for execution of top officials' orders, or into administrative procedures for formalistic introduction of innovations;

– crowdsourcing in a particular public authority can hardly be permanent, since it is problematic to keep a community of experts active and motivated for long;

– crowdsourcing should stem from general ideas about the current state, problems and specifics of a particular authority, the regulatory environment in effect, the established system and structure of management etc. Without this knowledge, being based on public examination results only, there is a high risk of a 'technical' approach to the problems of the authority;

– a crowdsourcing model should include a proven means of combating information noise, antispam and antibot tools, filters of idea flow beyond the limits of common sense;

– crowdsourcing must be based on an active work mode, providing daily monitoring of the incoming proposals, ongoing dialogue with experts to maintain their interest and transparency of discussions;

– to introduce crowdsourcing, special software should be used.

When these conditions are met, results of crowdsourcing for an authority can be predictable, looking as follows [74]:

– a positive political image due to improved interaction with consumers of administrative services;

– a positive image of management through introduction of modern management technologies;

– creation of a bank of innovative and realistic ideas;

– improving the quality of regulatory and methodological documents by using results of public expertise;

– forming a team of professional and public experts;

– optimizing the timeframe of searching for new solutions and preparing documents of fundamental social and professional value;

– raising the efficiency of budget costs, replacing expensive professionals with collective intelligence.

On the national scale, introduction of crowdsourcing in the public sector will help create a civil society, in which the activity of citizens,

public expertise and people's control will be inherent characteristics of the process of important government decision-making.

In general, a wide use of the network crowdsourcing mechanism in public management at all levels and stages of decision-making allows maximizing the benefits of the information society: the openness, transparency and accountability of public bodies; uniting people around common goals; creating conditions for public manifestation of initiative; forming the most important tools of feedback from active citizens who want to contribute to the development of their country, region, city.

The mechanisms of online evaluation are essential tools of civic influence and control of the authorities. A variety of these tools within the system of e-democracy includes: online surveys, online evaluation, online rankings, online expertise and so on. Users of the e-democracy system evaluate collectively the authorities' activity, thus forming a kind of consolidated assessment.

The evaluation procedures may be applied to both general matters of government performance and regulations, action plans, financial documents, individual officials' work, the authorities' responses to appeals and requests of citizens and organizations, etc.

Today, surveys in social media networks are most popular, each member of an information resource being able to organize a public poll on any subject, including the problems of their place of residence [94].

Online evaluations are of certain interest for researchers of different scientific fields – sociologists, psychologists, economists, political scientists and others. This, of course, is explained by their advantages over traditional forms of research. Among the obvious advantages and additional features of this kind of research, there are:

1. Saving resources due to saving time, money and workforce. In an online survey, a researcher is able to gain a much larger number of respondents and thus achieve a significant cost reduction. However, online surveys will still require certain costs, e.g. for creation of technical conditions – server operation and maintenance, payment for services of a provider, software, etc. All of these are one-off costs, while the marginal cost to attract an additional respondent virtually equals to zero.

2. A large sample size at a low material cost per respondent, which reduces the value of a random error of measurement.

3. A high speed of polling in case of a large-scale online research.

4. A possibility of fast response without additional costs which allows changing research tools as new data becomes available.

5. A wide scope of research on different social groups and communities.

6. Accessibility of troubled and marginalized groups – drug addicts, criminals, sexual minorities, etc., as well as better-off citizens and people with high social status.

7. Focus on specific samples through involvement of people with specific interests by inviting them to participate in forums, chat rooms or newsgroups.

8. Relevance due to a much lower impact of the researcher on the respondent. The respondents' answers are less socially acceptable, socially desirable than in a situation of a direct conversation with the interviewer.

9. A high level of trust due to the anonymity of the medium, in which the specific culture of Internet users is manifested – curiosity, mutual assistance and willingness to help the interlocutor .

10. The scope of subject field coverage – an opportunity to study together with respondents delicate and closed to public discussion topics: cybersex, spouse infidelity, financial issues, child diseases, etc., with a sufficiently high willingness of people to reveal intimate details of their personal lives in the networks.

11. Organizational flexibility – the respondent chooses the time and place of polling, staying in a natural and familiar environment.

12. Programmable logic of survey to eliminate interviewers' traditional mistakes, for instance reading hidden clues, such as "hard to say'.

13. Timely programmable control during the survey. It becomes possible to detect logical contradictions in respondents' answers and their corrections, and to solve the problem of incomplete answers.

14. Broadening of respondents' perception of the survey due to the use of multimedia elements and hypertext.

15. The possibility of interactive communication with the respondents.

16. The possibility of automatic collection of further information about respondents (ISP-type, IP-address, software, e-mail address of the respondent, place of residence from the filled in questionnaire, etc.).

17. Automation of collection, storage and processing of survey results which saves operating time and reduces the error rate.

Such a large number of advantages, truly unique and unusual to any other type of sociological research, makes online polls one of the most common methods for studying public opinion.

Analysis of research and publications allows making a conclusion that the development of the e-participation mechanisms as an active element of e-democracy is a global trend. It should be noted that each country has its own history and dynamics of the emergence of these technologies, largely due to social, institutional and technological conditions of all the interaction participants [2].

This mechanism of social life is formed by government agencies, public organizations, movements, and citizens. At the political level, e-participation technologies have also found support in the programs and projects under the title of "Open Government". When it comes to e-participation development, it is possible to analyze data obtained directly from the information resources providing the relevant services.

To effectively meet the challenges of introducing e-participation technology, it is necessary to assess the readiness of the society for new technologies, and perform a regular automated monitoring of the impact of e-democracy implementation.

In the study of e-participation, it is customary to discern three basic mechanisms of interaction between citizens and public institutions [90].

The mechanisms of informing provide unilateral relations between the government and citizens, when the government produces and delivers information to citizens. This implies both a passive access to information and active government measures on dissemination of information among citizens.

The mechanisms of counseling provide bilateral relations, setting feedback. They are based on the government's preliminary identification of problems, about which public opinion will be taken.

The mechanisms of active participation (decision-making) are based on partnership with public institutions, in which citizens are actively involved in the course of policy-making and public administrative decision-making.

To evaluate the extent of e-participation, the following characteristics can be used: a developed effective public debate; sophistication of multidirectional interactive communication flows; availability of mechanisms, through which citizens and government officials can find out each other's opinions; sufficient rationally organized and structured information, which citizens trust and rely on when making decisions.

More detailed criteria for evaluating e-participation are proposed by the UN experts who research on a regular basis global reports on the development of e-government in the countries of the world. The authors introduce an e-participation index, which shows how well-developed the tools for e-participation on official websites are, and to what extent public participation is used in decision-making.

To study the quality of consultation as a participation element, the UN experts have worked out the following criteria:

– explanation of e-consultations importance and informing citizens of consultation procedures;

– choice of online consultation tools (to allow citizens to comment on topics selected by the government for consultation);

– citizens' use of discussion forums and other tools for contact with the government and the quality of these discussions (with content analysis);

– selection of topics for online consultations;

– availability of an information directory for on-line consultations/ hearings and links to documents on the topic;

– creating incentives for citizens to participate in online surveys;

– involving citizens to take part in shaping the agenda;

– a possibility of participation in discussion of the key policy issues.

The most advanced tool of e-interaction between citizens and the government is cultivating their relations in the course of decision-making. That is what we call an active participation of citizens in decision-making. It is not citizens' proposals, but rather government actions on their practical implementation that is crucial to the process. Therefore, the most important interaction criteria are:

– a possibility for citizens to submit petitions online;
– considering the received public opinion before making decisions;
– an official government report on handling public opinions;
– establishing the duty to respond to online requests and online inquiries within a set timeframe.

Thus, implementation of the e-participation technology offers new opportunities to citizens to participate in the political process: awareness of current social problems, enhanced feedback from government institutions, impact on the agenda and socio-political decision-making. This improves transparency in the state institutions' activity, raising the level of public trust in the state [90].

The mechanism of forming online communities provides planning and implementation of civil initiatives and collective action projects. This arrangement saves resources for social mobilization and extends direct democracy, in which citizens can participate without direction and on the principles of self-organization not only in initiating, developing and making social and political decisions, but also in their implementation both locally and nationwide, and coordination of measures to affect the authorities and other responsible organizations [45].

Collective discussion of socially significant problems, and generation of consolidated positions frequently promote formation in the Internet of the so-called virtual communities, united by certain common interests or needs, communicating with one another to discuss various social and political issues and problems. In some cases, this form of communication can act as a kind of equivalent for associations, social meetings, street pickets, rallies, marches or demonstrations. In this case, modern digital technologies make it possible within a few minutes to distribute the results of virtual communities' activity in popular social media (blogs, forums and social networks), where these materials are made public, or sometimes become a subject of litigation.

Public censure is still an effective tool to combat a variety of modern social system diseases. Publicity can fight bureaucracy and corruption in the political sphere more effectively.

Public disclosure of socially important problems is not the only tool affecting the process of socio-political decision-making. Online communities are also used by their members as a convenient means of planning and organizing real events. The so-called flashmobs have become popular along with protest actions, which, unfortunately, in some cases erupt into mass riots and pogroms.

At present, organized online communities are not only an additional and important factor of forming new civil society structures (mutual aid societies, voluntary and environmental movements, virtual parties and media, etc.), but also a powerful economic and political resource. Many social networks, e.g. Facebook, feature invitation of users for events, and provide opportunities for mass messaging, which ensures fulfillment of these functions much more quickly and economically than the traditional tools.

The automated monitoring mechanism provides the following opportunities for researchers [97]: presentation of voting dynamics data; monitoring the current voting situation; the use of filters and snapshots to search for initiatives and analysis of the current voting state and dynamics. The possibilities of automated monitoring allow conducting certain analytical research, namely: positive response analysis; negative feedback analysis; detection of problems in regions based on the analysis of regional initiatives content; evaluation of citizens' interest in the social initiative project, etc. All the analytics is built on databases with an access to them when forming inqueries and obtaining data for further analysis.

Implementation of these technologies gives citizens a real opportunity to affect the quality of work of public authorities and local governments – not occasionally, but in a system manner – in the form of public dialogue helping solve socially significant problems and evaluate public authorities' performance.

To create an effective e-democracy system is possible solely through e-collaboration, entailing not only the rights of citizens and their associations, but also their responsibility.

In this case, it is essential to respect such constitutional rights of citizens as the rights to freedom of expression and freedom of assembly; privacy; personal and family secrets; privacy of correspondence, postal, telegraphic and other communications; free search, obtaining, transfer, production and dissemination of information by any legally recognized way.

Thus, the evidence suggests that e-democracy development is based on introduction of a set of interrelated mechanisms: network communication; e-voting; appeals and requests; e-petitions; network crowdsourcing; online evaluation; e-participation; formation of online communities; automated monitoring. Today, there exist problems of introducing interactive communication technologies and citizens' e-participation in social and political issues. Also, it is problematic to apply the tools for network monitoring of public authorities, which includes constant monitoring of unsolved problems in housing and utilities, education, healthcare, and informing the authorities about these issues via e-technology means, but also monitoring the very procedure of making and implementing decisions by the government with citizen participation in the procedure.

2.4. Mechanisms ensuring open government

The main priorities of the "Open Government" international partnership of countries include: free access of citizens to public information; free use of open public data; transparency in public spending at different budget levels; accessibility of parliamentary information in a structured and open format; disclosure of income of elected and appointed public officials; communication between citizens and the state in an open dialogue format.

The Open Government is seen as a system of mechanisms and principles for optimization of cooperation of the government and society that contributes to overcoming antagonism between the object and subject of management, and distrust of public institutions in the government. It is a space for public debate and government initiatives. The Open Government addresses, firstly, a closed procedure of decision-making by public authorities at all levels, making the state information system open for communication; secondly, search, testing and introduction of mechanisms for public influence of government decision-making allows implementing the collective action mechanism that democratizes management.

One of the main ideas of the open government is socialization of information, i.e. a wider use of information by the community that flows in three directions simultaneously: from government to citizens; from citizens to government; within the state apparatus. The next evolutionary step would be socialization of administrative services and processes through involvement of individual users and online communities to perform part of the public administration processes or their transformation through the use of external data and applications [93].

Another important aspect is public bodies' enhanced application of the same technologies that are available to and widely used by the mass consumer, that is cloud technologies and social networks. The driving forces of this process are a desire to reduce the cost of upkeeping the state apparatus and the intention to establish effective interaction with citizens.

In turn, citizens expecting greater transparency from the government must be prepared to ensure their own transparency, i.e. the government is also studying the data that customers published in the public domain, and uses them in conjunction with personal data stored in public databases [10].

It should also be noted that some goals, needs and aspirations of open government are partially contradictory [9]:

– improvement of transparency in order to increase confidence in the activities of the various branches of government;

– reducing the load of working on applications and requests based on the legislation on freedom of access to public information, that is the more material is placed online, the easier it is to fulfill such requests simply by redirecting applicants to the relevant web-sites;

– providing public with initial data sets, and on their basis creating useful and innovative services, from which, ultimately, citizens will benefit;

– providing public with initial data sets so that to help public authorities detect discrepancies and improve the quality of data;

– providing public with initial data sets so that citizens could help address the problems that are not solved yet or have just emerged in public administration;

– providing public with initial data sets to make other public bodies do the same, ensuring both the internal and external transparency of public bodies, etc.

Depending on what the main driving force for openness is, its content changes, as well as the distribution of efforts among various areas, and strategies and plans to build open government are adopted.

One of the principles underlying the partnership is complete accountability of governments of the participating countries to national and international monitoring organizations that can significantly reduce the country's political sovereignty.

Therefore, the countries – participants of the partnership focus on certain priorities. That is, some states pay very close attention to public data, others – to fighting corruption, and still others – to interactivity, feedback from the state and civil society, and so on. In addition, each state independently declares an individual set of key objectives and mechanisms in the framework of openness with account of the national features that are a priority for the development of openness in the near future [27].

At the same time, the road map of the open government of a country that joined the partnership initiative, involves the country's participation in all the partnership issues. The road map should be focused on solving the problems of public institutions' openness with account of the current national features.

At the present stage of development, it is most urgent for the countries to introduce the following mechanisms that ensure the openness of the government: open data mechanism, anti-corruption mechanism, the mechanism of declaration of income, social initiative mechanism (Fig. 2.8).

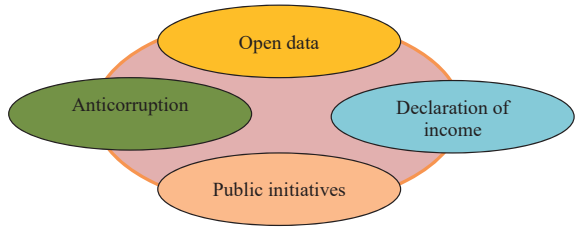

Fig. 2.8. Mechanisms to ensure open government

The open data mechanism is a foundation, on which the entire system of open government is built. Open data is not only disclosed information about the activities of the national, regional and local authorities; it is a technological mechanism that allows, on the one hand, activating the society and enabling non-profit organizations and activists to use this raw data within a variety of public projects, and implementation of civil control over the authorities. On the other hand, it enables businesses to create useful commercial products or improve the existing ones. The state, in turn, should provide data in a machine-readable form without license, legal and other restrictions on their further use.

The main purpose of publishing information in the form of open data is creation of conditions for a maximum international, political, economic and social effect of using open data by all stakeholders: government, businesses, and society.

Placing information of public authorities in the form of open data contributes to: increased transparency of public authorities at all levels; publication of data in a format suitable for automatic processing with its subsequent use for creating applications and services; expansion of the information base for analysis and use by business entities, research organizations, educational institutions and individuals for their own benefit.

The main value of open data becomes evident in case of the most extensive use of e-services (e-applications) based on open data. On the one hand, it is investment made by IT-companies, on the other hand – by the state. For a successful balance of interests, it is necessary to promote open data in the IT-community, highlight success stories, and prioritize information disclosure in public authorities.

International practice shows that the very fact of disclosure of data on the authorities' actions encourages citizens to be more aware of potential problems and prospects of interaction, and hence – to participate in improving the situation in the future. The open data can belong to quite different industries or areas of municipal activity. Examples of data sets, the opening of which is socially useful, are given below [85]:

1. The history and statistics of accidents that caused pollution. This data may include date, place and description of the problems that have led to contamination or other impact on the environmental situation.

2. Statistics of committed crimes and other offenses, including dates, time, location, type of offense, information on crimes and victims, and other relevant information.

3. Statistics of disasters and financial losses incurred. It is necessary to fix the place, time, type of disaster, the number of people affected, and estimated financial cost of damage.

4. Municipal procurement statistics. The data array includes a date of purchase, its content and amount, financial cost, and the responsible department.

5. Characteristics of municipal water bodies with description of their location, name, environmental characteristics of water (the level of water pollution). Similar statistics can be given for parks and natural reserves.

6. Characteristics of education and healthcare facilities with description of the name, location, quality of services provided, lists of employees, and other useful data recorded in the reports of city agencies that regulate the relevant spheres.

7. Characteristics of cultural facilities and cultural heritage objects with information published on theaters, cinemas, pieces of architecture and art that exist in the city.

8. Accordingly, data sets on city life can by gradually built and published in the appropriate official open-data information resource.

The most important element of working with open data is their provision in the most readable and interpretable form suitable for both computers and users.

For effective human perception of data set, data visualization is required, which is typically done through binding statistics and data to geographic maps. Thus, working with an interactive map, the user can see a graphic relationship between the data and place, with which it is associated.

Another interesting tool, "tied" to viewing public data, is a special browser, in which, for example, the movement of data on every region can be viewed online.

In addition, each data set can be viewed, downloaded to the user's computer in an easy format, and visualized as diagrams or the like.

The analysis [93] leads to a conclusion that today official authorities of many countries have their open data portals.

In the world practice, there are certain standards, requirements and recommendations concerning data disclosure and publication. The basic principles of open data formation are as follows: primacy, completeness, timeliness, suitability for computer processing, lack of access discrimination, lack of proprietary formats, license purity.

Implementation mechanisms for data opening should be aimed to [44]:

– improve human resource capacity of the civil service;

– improve the quality of public authorities' decisions;

– raise the effeciency of budget service delivery through development of a competitive environment and full use of the society's potential in government decision-making and fulfillment of certain state functions;

– reduce corruption in government, particularly in budget service delivery;

– improve the quality of administrative services and the level of population's satisfaction;

– enhance the regional investment potential and the competitiveness of territories due to a clearer and more favorable institutional environment and investment opportunities;

– improve the quality of life through timely and optimal response to the socio-economic challenges;

– increase trust between the state and society.

The use of public open data projects is based on two components –involvement of citizens and providing them with convenient tools to work with data. Without a broad participation of citizens in public projects public administration can not use the feedback tool; nor can public debate be initiated on how to solve the problems identified by analysis of publicly available data. Also, without providing citizens with convenient data access and data processing tools, it is impossible to keep up their interest in project participation. It is essential to provide the user's intuitive access to data by arranging convenient formats for dataview, understadable downloading tools, data set classifications [85].

A possible solution to the problem of effective open data use is seen in formation of metadata, and the so-called linked data, which is received from introduction of additional attributes of data description in languages suitable for computer reading (Semantic Web languages). The use of linked data structures allows combining government data with personal data of a user or a group of users if it is filed in a machine-readable form. In so doing, the context of users' existence in the network can be combined with their need in certain data, enriching the information on public data sets with new metadata from users.

From the perspective of citizens as consumers of open data project results, there is a problem of trust in the published results, infographics and available applications. Perhaps the least expensive way to solve the problem of data quality is a general user voting for the most useful data sets and the most useful applications based on open data. The relevance rating of data and applications can guarantee that their quality satisfies the consumers.

Another common way to improve the quality of applications that are published by enthusiasts, is arrangement of best software contests by the authorities. These measures not only promote public interest, but also improve the quality of products.

The process of publishing data on official government resources may require additional regulation and support on behalf of a responsible public authority. Such regulation may include answering questions concerning liability for the data accuracy, the procedure of complaining about the quality of published data and possible formats of data publication, regulation of intellectual property rights, and other legal or ethical problems.

An important block of problems related to the use of open data is the authorities' attitude to data openness and accessibility. It is stressed that agencies should undergo a cultural or axiological change of status from "owning" data to "providing availability" of data, which they own. Another facet of the problem of open data is understanding its possible social value.

The idea of creating an "open data ecosystem", which implies existence of a single platform of data and applications from various fields of activities, structured or centered in relation to citizens as users of such systems, is also recognized as promising. This idea is congruent with the concepts implemented by major players in the market of smartphone platforms (Apple Inc, Google Inc.) that sell not a smartphone itself, but rather the access to their own systems of applications to work with virtual and actual realities. It is the presence of a convenient ecosystem of interactions that can allow the state and society to effectively cooperate in exchange, processing and access to open data and applications for them.

Additional public interest in open data projects will be caused by opening of data sets that will evoke interest in wide social strata. Analysis of international experience shows that the most interesting realms for opening data are: fiscal budget of governments, criminal environment,

ecology and environmental protection, geographical systems and maps of spatial data, natural disasters, transportation problems, the work of public utility services.

To make the anti-corruption mechanism work, first of all, public participation is required. Therefore, most of respondents in the European countries believe that the primary role in fighting corruption belongs to civil society, and it is the duty of every citizen. Therein lies the dramatic difference. Every nine out of ten residents, e.g. in Switzerland or Norway, are ready to report on corruption [24].

The effectiveness of interaction between civil society institutions and the state in combating corruption is based on the mechanisms of public control and real anti-corruption practices of civil society participation in anti-corruption policy.

Public control is an attribute of an open society and one of its key features. Through public control, the standards of lawful activities of the entire society and individuals, groups and institutions are formed.

Public anti-corruption monitoring as a mechanism for combating corruption, especially in public administration, includes a sequence of activities carried out by citizens and their autonomous associations, aimed to prevent and eliminate conditions enabling corrupt relationships, to detect and stop corruption.

Evaluation of openness and democratic development of each country must, in addition to the traditional standards of the Council of Europe, include the following parameters:

– transparency of political decision-making;

– the level of public political activity and its impact on the functioning of the parliament as a forum for democratic debate and decision-making;

– the extent, to which civil society structures and organizations are free from government control and do not act as consealed opposition parties lacking democratic legitimacy;

– measures to protect democracy against non-democratic initiatives.

Therefore, public anti-corruption control is not only a means of combatting corruption, but also a factor of openness and democracy.

The principles of this control are [101]: priority of human and civil rights and legitimate interests; voluntary participation in effecting public control; autonomy of public control subjects; publicity and openness of public control and discussion of its results; legitimacy of public control subjects' actions; objectivity and reliability; inadmissibility of obstruction to public control; mandatory consideration of public control results by public authorities and local government bodies; public control subjects' independence of public authorities; inadmissibility of interference in the activity of state bodies in cases established by law.

Public anti-corruption control includes various mechanisms of citizen engagement in combatting corruption [101], and namely:

1. Public monitoring – a systemic observation on behalf of public control subjects over compliance of public control objects' activity with public interests.

2. Public expertise – the use of special knowledge or experience by public control subjects to research, analyze and evaluate documents and materials relating to public control objects' activity in terms of their compliance with the public interest.

3. Public hearings (discussions) aimed to realize the rights of citizens to participate in public authorities' and local governments' decision-making as to public discussion of draft decisions, with obligatory participation of entrusted representatives of the authorities and local governments, and representatives of citizens, whose interests are directly affected by the decisions, and discussion of the regulatory acts as regards their compliance with the public interest.

4. Public inspection (investigation) – a set of public control subjects' actions on information collection to determine the facts and circumstances as to public control objects' activity in order to check its compliance with the public interest.

The practical impact of the public monitoring as a mechanism to combat corruption lies in the authorized public bodies' investigation of all the corruption instances and facts, to be detected and presented to public authorities as a result of public expertise. If there is evidence that the facts are true, those directly involved in corruption and contributing to it must be charged with administrative or criminal offence in accordance with national law, while the officials, who made it possible for the corrupt relations to emerge in their subordinate bodies – dismissed in a voluntary or forced manner. Public control should detect and identify the conditions and circumstances of legal and organizational nature that contribute to emergence and spreading of corruption relations in public authorities.

The introduction of mechanisms for anti-corruption interaction between the government and civil society institutions is prone to the following risks [101]:

– refusal to interact with the public for classification reasons;

– a formalized selection of those who are "granted permission" to participate in combatting corruption on various grounds, including by the criterion of loyalty to the state institutions, individual government agencies;

– a formalized recording of a public position as to fighting corruption, without a real consideration of public opinion or investigation of the revealed corruption offences;

– no duty to inform about the action taken on the facts that have been detected by civil society representatives;

– lack of competence in some representatives of civil society, including those authorized to represent a public position on application of anti-corruption measures.

In summation, it can be said that when public anti-corruption control is carried out objectively and rationally, it can significantly enhance the public authorities' efficiency and responsibility in serving public interest.

A key condition for a quality and effective anti-corruption work of the public control mechanism, as well as of all anti-corruption measures, is that every citizen should be able to challenge public officials' unlawful actions or inaction in a fair, impartial and objective court that is not subject to any "undue" influence.

It is the countries that provide greater openness of their power authorities, develop civil society and protect the freedom of speech which succeed in vanquishing corruption.

Therefore, an increased pressure of the entire society on corruption and formation of a new anti-corruption policy are recognized as important aspects of the national security, and fighting corruption – a priority of public bodies.

A desire of countries to integrate into the European Community binds them to conduct a serious study and implementation of international experience of developing and implementing political, institutional, and legal mechanisms for fighting corruption.

The effectiveness of anti-corruption strategy is determined not by the number of proposed actions, but by their ability to affect the situation. Therefore, a study of foreign experience gives an opportunity not to repeat the mistakes of others.

The world experience shows that today it is necessary to create specialized institutions and appoint independent officials, responsible for prevention, investigation, and prosecution of criminal offences related to corruption.

Given a large number of such institutions, the diversity of their functions, as well as diverging assessments of their actual activities, it is difficult to identify all models of anti-corruption institutions that exist in the world. Nevertheless, it is possible to identify certain regularities and present the main models of specialized institutions, based on their functions.

The basic models of specialized institutions include [90]: institutions preventing corruption and developing coordination policy; anti-corruption departments in law enforcement bodies; multipurpose anti-corruption agencies with the powers of law enforcement.

The model of institutions preventing corruption and developing coordination policy covers institutions that perform one or more preventive functions: investigation of corruption as a social phenomenon; identification of corruption-contributing factors; monitoring and coordination of anti-corruption programs and action plans implementation; review and preparation of the relevant legal acts; control of conflict of interest and disclosure of civil servants' assets; development and introduction of codes of ethics; assistance in holding educational events; consulting on civil service ethics; support for international cooperation and interaction with civil society, etc.

Examples of the said institutions are set by France (Central Service for the Prevention of Corruption), Macedonia (State Commission for Prevention of Corruption), Albania (Anti-Corruption Monitoring Group), Malta (Permanent Commission against Corruption), Serbia

and Montenegro (United Service – Anticorruption Department), the USA (Office of Government Ethics), India (Central Vigilance Service), the Philippines (Office of the Ombudsman), and Bulgaria (Commission for coordination of efforts in the fight against corruption).

The most common model of anti-corruption agencies in Western Europe is that of anti-corruption departments in law enforcement bodies. Anti-corruption institutions of this type have different specialization, which includes:

1) carrying out operational search activity;

2) investigation for prosecution of corruption-related crimes;

3) operational search and investigative activities in connection with investigation of corruption offences. These law enforcement agencies in some cases perform preventive, coordination and research functions.

Multipurpose anti-corruption agencies with the powers of law enforcement are the most striking example of a universal approach to the problem of corruption – a combination of preventive and repressive functions within a single institution.

Institutions that belong to this type, perform the tasks of: investigative activity; developing anti-corruption policies; analytical work; assistance in crime prevention; cooperation with civil society; collection and analysis of information; monitoring of anti-corruption program implementation.

It should be noted that in most cases prosecution is a separate function within such agencies, which is done to provide for a system of checks and balances (provided, of course, that specialized institutions are vested with the necessary powers and independence).

It is commonly supposed that this model is associated with the Independent Commission against Corruption of Hong Kong, and the Office for the investigation of corrupt activities in Singapore. The success of these two institutions encouraged governments around the world to create similar institutions – in Lithuania, Latvia, Australia, Botswana, Uganda, and New South Wales.

In order to study the international experience of anti-corruption agencies, Princeton University launched a program "Innovations for Successful Societies" (ISS). The University researchers studied the practices of fighting corruption in the governments of Botswana, Croatia, Ghana, Indonesia, Latvia, Lithuania, Mauritius, and Slovenia. An article in the British Guardian reports on results of that work [5].

Consequently, the ISS program researchers discovered an interesting pattern: there are certain common approaches and practices in the work of the above institutions, due to which they successfully overcome dangerous obstacles and improve their performance, including:

1. A mighty system of internal control and reporting allows anti-corruption agencies not only to successfully fulfill their mission, but also to avoid the internal corrupt practices that usually destroy the reputation of these organizations.

2. The open competition approach to recruitment, introduction of high ethical standards and detailed elaboration of internal procedures allows many organizations to avoid abuse of power by their officials.

3. External support and partnerships are critical to anti-corruption agencies' success, enabling them to confront the attempts of their powerful and influential opponents to hinder anti-corruption activities.

The development of effective partnerships with various social groups and organizations requires creativity and careful planning. For example, the Croatian Bureau develops cooperation with the media, eliminating traditional barriers in communication with journalists and influential activists. In Ghana, the government agency encourages activists to create community centers and non-governmental organizations, and the agency's director of is also the chairman of the local branch of Transparency International.

The most often mentioned important external partners are local scientific and research centers, institutes studying the problems of law and legislation, other state agencies of the sphere of information and communication, international organizations, particularly those operating under the UN auspices.

Preventive and educational activities are considered to be the most effective means of fighting corruption, but it is also important to pay attention to changing standards of conduct in the government and society in general. These important areas of work should always be in the focus of government agencies, as they are not only effective, but also face a minimal resistance risk on the part of opponents.

Several successful examples of such activity are found in Mauritius, Botswana and Indonesia. The appropriate agencies of these countries regularly deliver trainings and lectures to the staff of various public institutions on effective fight against corruption, based on the best practices.

Some agencies, thanks to their capabilities, support, and credibility are able to fight corruption in the upper echelons of power and among influential groups closely connected with the government. Others, however, have limited opportunities and influence, and therefore are not ready to exert pressure on the corrupt officials.

Certainly, the above features and common approaches of the anti-corruption agencies around the world can only be part of a comprehensive strategy and do not guarantee the emergence of a corruption-free government. However, they are a valuable resource and can be applied effectively when creating or reforming institutions to combat the epidemic of corruption.

The deep roots of corruption that hit the Ukrainian society in the last twenty years, and unsuccessful attempts to counter this adverse phenomenon have stipulated a fundamental legal study of the problem and adoption of a comprehensive package of legislation, creating a significant anti-corruption front.

The state should know the incomes of its officials, and if these incomes are out of proportion to real earnings of civil servants, there is every reason to assume their illegal origin. Besides, the mechanism of declaration of incomes and expenditures of civil servants facilitates their timely and proper taxation [32].

The duty of civil servants is to submit for publication the information about incomes, assets, liabilities of material nature, which is nothing but a security rule meant to prevent a form of corrupt behavior, at the same time ensuring the transparemcy of the public authority's operation.

In this case, the balance between private and public interests and the rights of public employees are not violated because civil servants are citizens involved in implementing power-public functions of the state. Civil servants, on the one hand, are a source of danger, since there is a threat of their corrupt behavior. That is why they can be justifiably subject to certain restrictions of their personal rights, in particular the right to privacy of personal data. This is also confirmed by international practice of the European Court of Human Rights [103].

The results of studying foreign experience show that prevention of public officials' illicit enrichment is performed by checking information about their incomes, assets and liabilities of material nature, and in some countries – about expenditures as well. The recent global trend is assigning officials with the duty of declaring their expenditures.

For example, in the USA civil servants are bound to submit to the Office of Ethics information on their expenses and incomes, as well as on expenses and incomes of their close relatives (children, husband/wife, parents), including the information about: the origin of property, its composition and costs; deposits, borrowed and granted loans, and received credits; gifts, the value of which exceeds 50 USD; transportation, entertainment and other similar services, paid for with funds other than personal or budgetary (specifying their source) [36].

Additionally, in the United States, a system of internal control is formed to check police officers' expenses, including declaration of expenses, monitoring of credit card balance of all the staff, and collecting bank data on employees who are consumer credit debtors.

Finland also provides for declaration of expenditures by police officers. In addition, government agencies competent to register large transactions, including purchase of property, must inform the Tax Office of Finland of the relevant contract expenses. In case of discrepancies found between the Finnish citizens' incomes and expenses, the Tax Office sends a letter to a taxpayer requesting explanation and specification of the income source.

The civil servants of Singapore have to submit annual reports on their expenses since 1952. Information on civil servants' expenditures, incomparable with their incomes, can serve as grounds for inspections by Corrupt Practices Investigation Bureau.

The Albanian civil servants are also required to submit information on their expenses, along with that about their incomes.

Depending on the declaration subjects, all countries can be subdivided into three groups [36]:

– countries, in which all individuals, regardless of their involvement in civil service, are required to submit information about their incomes, assets and expenses to the tax authority (Italy, Norway, Canada);

– countries, in which public officials are required to submit a declaration both as taxpayers and officials (Finland, USA);

– countries where data on incomes and expenditures is submitted only by government bodies' officials (Ukraine, Brazil).

The experience of most countries shows that disclosure of expenses proves to be more effective when there is a single public body that collects and analyzes declarations of public officials, initiates, if required, investigation of public servants' activity. Investigations can be conducted by both internal control bodies and law enforcement agencies; however, it is important that a government body, to which a declaration is submitted, were able to promptly start the investigation based on the information.

The mechanism of social initiative ensures implementation of proposals concerning the country's socio-economic development, and improvement of public administration. Any idea of a citizen or a group of citizens should first find support among of the expert group members, and then in the society.

All civil initiatives can be divided into "conflict" ones that oppose something and protect social interests, and "supportive", which focus on realization of certain interests.

Formation of public initiatives can be achieved through a global, universal and structured online resource of public open interaction among citizens, public authorities and local governments, organizations, parties and civic movements.

This online resource allows: 1) users to post and discuss problems, and collect votes in their support; make appeals in the form of statements, suggestions, complaints, initiatives etc. and submit them to organizations, as appropriate; 2) organizations, to which the appeals are sent, to openly post answers and make the appropriate decisions; to receive the results of monitoring citizens' economic, social, cultural and spiritual life in a territory of their residence (problems, protests, public opinions, etc.); 3) the public to post evaluation of organizations' response to appeals of citizens and the relevant decisions made.

The main principles of social initiatives realization through the Internet resources are as follows [48]:

– publicity and openness of interaction between citizens and the authorities, local governments or other organizations;

– free and equal access to information and IT;

– independence of political and administrative influence;

– responsiveness and interactivity of citizens' communication with the government, business and non-profit organizations;

– compliance of the legal acts, standards, and regulations governing the relations of citizens, businesses, and public authorities.

The Internet projects of forming and implementing social initiatives fulfill the following tasks, urgent and important to the modern information society [48]:

– providing a universal communication platform in order to give citizens and expert communities an opportunity for an open public discussion of important social issues;

– getting citizens and organizations involved in making state and local-government decisions, including by means of mobile devices;

– improving the efficiency of anti-corruption measures;

– public monitoring of public authorities' and local governments' activity with public evaluation of the interaction of citizens, authorities and local governments, organizations, parties and social movements;

– monitoring the receipt and consideration of open public appeals (individual and collective) from citizens and organizations to public authorities, local governments, and other organizations;

– improving social security, and quality of life by increasing the responsibility of the authorities, local governments, and other organizations for making decisions on open public appeals of citizens;

– formation of loyal partnership attitude of citizens to public authorities, local governments, which explains why the end product of an open public discussion is a documentary appeal to public authorities, local governments and not a call for protest action.

Quite a long list of opportunities provided for all interaction participants should be noted as a positive characteristic of the public-initiative Internet projects. Problems, which a user considers important, can be openly published in an information system, with mentioning of the name of the responsible organization. Information on the outcome of appeal consideration and decisions made can be received promptly. The reported problems can be accompanied by pictures and videos, and by copies of documents (organizations' official replies, technical documentation, inquiries of MPs, media coverage), including journalistic investigation reports and so on. It is possible to create a personal release in the homepage, stating the needs and interests (by a territory, category of problems or appeals, organization).

Public authorities and local governments should receive timely information on the issues reported by citizens; respond proactively to problems arising in the territory controlled by an organization; process and analyze information on an appeal by a variety of criteria and parameters; conduct puplic surveys and release ads for citizens residing in a particular area; assist executives in control of their staff responsible for recording and consideration of appeals, and periods of consideration; provide for configuration and integration with other systems.

The opportunities of NGOs, trade unions, political parties include: taking part in discussion of issues published in an information system on equal terms with users; placing in the public domain and mailing out replies on appeals addressed to them; conducting intraparty dialogue; competitive inter-party fighting in the public politcy sphere; supervising and assisting citizens in solving their problems specified in appeals; agitation and propaganda measures to attract supporters.

Summing up the above reasoning about the open government mechanisms, it can be said that they ensure an effective implementation of the Internet projects of developing an open and democratic society through active participation of citizens, who are really interested and willing to participate in the process. The projects incentivize politically active citizens, for whom the Internet has already become the most important means of interaction with the authorities, NGOs, and businesses.

3. INFRASTRUCTURE OF SERVICE-ORIENTED STATE

3.1. Service mechanism of e-administrative service delivery

One of the priorities of the public administration reform is to build a service-oriented state. In this context, the core of the service approach to public administration consists in the following: public institutions should provide better services for citizens through the use of modern electronic service delivery; public administration should turn primarily towards satisfying the needs of citizens, not those of the bureaucracy; in the present conditions, all the activities of the civil service should be regarded, first and foremost, as the service of rendering services to citizens.

Thus, an efficient public administration is only possible on condition that e-services for administrative service delivery are implemented, which promotes completeness and accuracy of information, rapid adoption and implementation of management decisions at all levels of power, and a high quality of e-administrative services.

However, the practice of public administration has shown that the procedures for e-administrative service delivery have a number of specific deficiencies, such as: legal uncertainty; shortcomings of technical regulations; lack of service individualization and comprehensive evaluation; insufficient level of cooperation and integration for effective solution of inter-sectoral problems.

These circumstances actualize the need for improvement of the service mechanism of e-administrative services. The ideas of its content and components, improvement of legal, organizational and methodological foundations for introduction of e-services in public authorities activity require a special attention.

The aim of research is a theoretical justification and elaboration of scientific and methodological approaches and an array of tools for improving the service mechanism of e-administrative service delivery.

The service concept of public administration is a modern understanding of the social purpose of the state, in which service to civil society is a democratic governance priority, and the main form of government institutions – delivery of public services. The service concept of public administration views the authorities as a service provider, the system of public administration – as an organization for administrative service provision, and citizens – as customers and consumers [64].

The service mechanism of electronic administrative services delivery is related to the efficiency of identification, modeling, and implementation of individual and group interests and needs of citizens. For service organization of management, the dominant efficiency indicator is customer satisfaction with services. The service approach determines the development of network forms of management interaction, communication technologies of control and planning, development of online services [41].

Introduction of the service mechanism for service delivery should be based on the convenience and predictability of procedures for interaction with the authorities in obtaining services. These procedures must meet citizens' reasonable expectations, formed as a result of their interaction with business organizations. Interfaces that implement interaction with service-providing bodies should be convenient and clear. Designing interaction rules and interface elements, evaluation of understanding and convenience of implemented procedures should be carried out by studying the scenarios of citizens' behavior using polling methods. Requirements to procedures of service delivery, aimed to ensure their convenient and understandable use, must be secured by laws.

The basic services of e-administrative service delivery include: identification and authentication service, interaction and integration service, service of a single personal cabinet, transactions service, service of monitoring services quality, information and instruction service (Fig. 3.1).

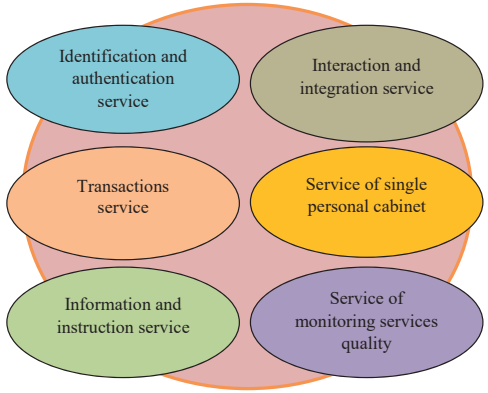

Fig. 3.1. Basic services of e-administrative service delivery

The identification and authentication service is the key e-government infrastructure component, through which a transition to administrative service provision in the e-form is enabled. An effective fulfillment of this task is possible due to implementation of the Unified System of Identification and Authentication (USIA). This service must have the following basic functional features: identification and authentication of users; filing of identity data of natural and legal persons, agencies and organizations, their officials and information systems; authorization of public agencies' entitled representatives; filing and supplying of information on users' priviledges as to information systems registered in USIA.

The main method of online identification and authentication is using a simple user account pair of login-password. To ensure the most reliable user access to services, the services of voice and biometric identification and authentication can be implemented. To use these services, it is necessary to formalize the procedures for application and

transmission of voice and biometric identification data in the relevant regulatory acts.

The unified space of trust for e-signature is one of the most important components of the functioning of service delivery services, providing information interaction through e-documents, certified with e-signature.

The functioning of a unified space of trust for e-signature is of particular importance in terms of forming e-archives of legally relevant public information. It is the most vulnerable component of the e-signature management infrastructure due to pooly regulated issues of securing the legal value of documents in the e-form on long storage.

It is necessary to enshrine in law the status and special features of storing archives of legally significant information in the form of e-documents, including arrangements to ensure their safety and inalterability, and to regulate the procedure of securing the legal value of archivized e-documents previously signed with e-signature, the validity period of which subsequently ended [81].

One of the main problems to be solved within the framework of a unified space of trust for e-signature is adjustment of procedures for identification and authorization check of a person using e-signature in different information systems, and ensuring the reliability of identification with the use of e-interaction services.

Also, for the purpose of users' situational convenience, it is necessary to develop identification and authentication services, which would allow government portals to form a delegation message that contains structured permissions to perform certain actions on the users behalf, including submission of requests for administrative services.

It should also be emphasized that there is a need for a uniform system of issued e-warranties, which will make it possible to check the authority of natural and legal persons in the real time mode, simplifying to a large extent the interaction between legal entities and public authorities in the e-form.

Another important aspect of developing online identification and authentication services is to make these services available to the private sector. Provision of a secure instrument for remote identification of markets will help protect the rights and legitimate interests of participants of relations and give an impetus to development of modern e-services requiring participant identification.

Similar systems of online identification are used in remote banking services. Every online-banking identification system is valid only for the customers of a particular bank, reducing financial availability due to barriers to transition from one credit institution to another, and necessitating a new personal identification.

One of the priorities, which can be addressed by application of the concept of one-time remote authentication by using USIA, is the ability to remotely open accounts in financial institutions.

The above method of access to one-time identification will increase competition among financial institutions, similarly to the project of changing service providers while preserving your mobile phone number.

It should be noted that the authorities are also interested in an interactive partnership with the society. Many public bodies lack resources for a specialized legislative expertise, or are in need of entrusted feedback services to implement important economic and social initiatives.

The above disadvantages can be compensated for by engaging outside experts or holding public discussions on special e-platforms, using USIA-based identification [81].

The service of interaction and integration is to ensure convenience and reduce the time of citizens' interaction with the state by providing the possibility of searching and obtaining all services on the single window principle at the Unified State Portal of Administrative Services as the only navigator and the only information service system for all public services, no matter which public authority provides the service or services.

At the same time, it is necessary to provide access to services of service delivery directly on user-visited Internet sites, including in liaison with commercial services of business companies. Public services of e-service delivery should be combined with the services of commercial companies according to life situations and needs of citizens. The potential of mobile applications should also be developed together with that of social networks and communication services, which are the Internet services most promising and popular with the users.

According to this approach, interaction with users is established by studying their behavior, needs, problems, situations and patterns of public service use in their daily lives.

The introduction of the interaction and integration service should be accompanied by implementing the following measures on: optimization of service provision procedures; improvement of e-interaction infrastructure; improvement of e-governance tools.

The basic principles of optimizing procedures for service provision are: priority of remote interaction between the applicant and the authorities; priority of automated procedures for providing services; reduction of service delivery period, reduction of the number of documents, and simplication of procedures.

It is important to upgrade the current legal regulation for developing administrative service portals and sites of public authorities, for them to switch from their current poor coordination to integration into a unified service-navigation system to provide for citizens' and businesses' most convenient access to services and public services via the Internet.

Provision of complex e-services is legally unadjusted with life and business situations, although thre are instances of services delivered in that mode, which calls for updating the legal framework.

It should be mentioned that a number of administrative services in the e-form can be provided without participation of public officials; part of services are provided for issuance of certificates, which are needed only for submission to other authorities. Thus, the regulatory support should be improved to transfer service delivery to the automated mode

with the user consent. Citizens should be informed about their right to receive e-administrative services, including in case of changes in their life situation.

In provision of administrative services, fulfillment of public functions and exercising powers, the law does not set a priority of an e-document over a paper one, and that of data – over a paper document; neither is determined the order of granting legal value to e-documents or data, used in public information systems. The appropriate changes in the current regulatory framework are needed, which would reduce a state document flow and the number of personal-storage documents.

With the previous approach to e-government development, three categories of users were considered: citizens, businesses, and government officials.

Today, the most urgent need of e-government is to take into consideration new and revised categories of users for an individualized look-ahead satisfaction of target audience demands.

In particular, non-profit organizations interact with the authorities in the e-format of commercial organizations, the need for separation of non-profit organizations into a user category of their own being related to the specificity of functioning of that sector (aiming to participate in decision-making and control of authorities, a need for self-organization and joint-action tools). Apart from forming their specific set of e-government services, arrangement of non-profit organizations' joint activities requires creation and use of special tools, such as services of joint action panels or social networking services.

The category of users who are interested in using the new e-government services includes mass media, ailiens and foreign countries' authorities, high-school and university students, researchers and teaching staff, people with disabilities.

Meeting the current and future needs of all user categories is a major prerequisite for e-government development. It implies formation of new values and objectives, the implementation of which is impossible without organizational, legal, and technological changes.

Thus, the fundamental principles of building the interaction and integration service are: to give users freedom of choice of the most convenient service delivery channel or several channels combined; an open service platform; personalized environment; and user involvement in the optimization processes.

Creation of a personalized user environment is aimed to provide an automated update of a user personal profile in the service of single personal cabinet, based on personal data and information from public authorities. This will greatly simplify the search for a particular service and services, and some of them will be delivered by public authorities through a notification procedure, without filling out and submitting applications. It is necessary to take into account regional specifics of the offered services with the possibility for the authorities to manage the deployment of the appropriate services.

The transactions service may include commercial, administrative and private aspects or combinations thereof. Today's websites of centers for administrative services are mostly intended to provide information, without the possibility of conducting transactions and a limited possibility of getting samples of documents which does not allow administrative service delivery online.

Since connection of transactions services for acception of payments in the e-form for each departmental or regional portal requires financial and organizational resources of service providers, it is necessary to create a single payment gateway as an independent e-government component, and to integrate it with the state payment information system ti ensure taxpayers' interaction with providers of payment services by the aid of e-format documents used by the budget payments system.

In order to significantly improve the quality of administrative services, cardinally reduce the number of personal-storage documents on a physical storage medium, minimize personal contact of citizens with officials and shorten service delivery dates, it is necessary to make a gradual transition to service provision in the e-form i.e. to a "register model" of administrative service delivery. It implies that a service result will be in the form of information in the basic state information resource, without issuing it in a paper form [81].

In this case, the result of service rendering will be a post in information resource (registry) or its renewal with preservation of the history of changes at the final stage of the departmental automated service delivery. The register model provides for storage of service results in a "cloud" of state information resources and issuing extracts from them at the request of the applicant, which will reduce the cost of manufacturing physical storage media, maintaining staff, and excluding forgery of a document in a permanent form.

Implementation of the register transaction model requires significant changes in laws and regulations in effect. In particular, the service result should be defined by law as the relevant information in the state information resources, and not as a document in paper or electronic form.

Information of the state information resources should be divided legally into that, the actions with which have legal consequences, and other information at the disposal of public authorities, i.e. legal value should be rendered to information from the state information resources used by citizens, organizations and public authorities. Additionally, the administrative responsibility of public authorities should be established for the accuracy and relevance of legally significant information.

Transfer to the register model of transactions affects the regional and local levels, where citizens often have to interact with public authorities and local governments, and it should be accompanied by optimizing service delivery. This means, among other things, the work on unifying the most popular, socially significant regional and local services and their implementation in the e-form on the Unified State Portal of Administrative Services, gradually eliminating duplication on regional portals.

In order to ensure a continuous improvement of the services quality and efficiency both individually and in concert with each other, a system of related indicators for monitoring processes – the service quality monitoring service – should be introduced. Creating an integrated analytical system will allow diagnosing the provision of services and their efficiency, individual steps, results, general and comparative demand, and combinations of individual services selected by users in different life situations.

A system of service performance indicators should be developed taking into account the specifics of individual user audience segments, which is stipulated by different patterns, situations, and scenarios of using the services.

All the diagnostics techniques should provide feedback to the processes of developing services to ensure their continuous improvement and compliance with the users' objectives.

Due to a general complexity of the interrelated procedures for service delivery and making services available, it is expedient to support them with explanatory real-time information (the service of information and instruction), which reduces the need for obtaining advice from representatives of the authorities. Also, in working with the service of service delivery, users can be aided by intelligent assistants created and developing on the basis of artificial intelligence technologies and knowledge management techniques.

It is appropriate to use all possible channels to raise users' awareness of the benefits to be obtained from using the Unified State Portal of Administrative Services, and continuously analyze citizens' online search, meeting their needs by placing ads through contextual advertising.

To increase the number of active users of the service portals, it is advisable to use the authorities' own communication channels: service centers, departmental websites, offices of physical reception of citizens, online newsletters providing comprehensive informing and instruction of citizens as to e-channels and services possibilities. Importantly, popularization of e-services in the form of physical reception of citizens should be carried out by consultants and service specialists in an active mode.

A major step in this direction is a general training of public officials who do not always have enough competence to use in full the capabilities of e-government systems and services in their activity.

Thus, the research has substantiated the necessity of changing the paradigm of constructing services for e-administrative service delivery. It is essential to: restructure the services on the human-orientation principle; form an integrated digital environment of the life of citizens and organizations while providing a continuous growth in e-administrative service quality; reduce the functioning costs and optimize cooperation of the state with local governments to get citizens involved in governance processes.

As a result of the conducted research, the service mechanism of e-administrative service delivery has been improved. Its content and components were found to be a set of services, namely: identification and authentication service, collaboration and integration cervice, service of a single personal cabinet, transactions service, service monitoring service quality, information and instruction service. The legal, organizational and methodological foundations for the introduction of the services of e-administrative service delivery into public authorities' activity have been proposed.

3.2. Methodology of administrative e-service regulation and delivery

Ensuring the availability of administrative services in the e-form is in the focus of the governments of all countries, introducing e-services. Every country defines its strategy and methodology of e-administrative service delivery. Here some actual methodological problems arise: regulation of administrative processes of service delivery; drafting administrative e-procedures; forming a system of administrative e-service delivery and ensuring their availability; establishment of a system of the national and regional portals of administrative services; organization of the processes of administrative e-service provision.

Regulation of the processes of administrative e-service delivery (administrative provision, official e-regulations, standards of administrative services) may be effected in the following order: analysis of the current regulatory framework and administrative practices; formation of proposals for process optimization (in particular, taking into account the needs of service users); forming optimal models of administrative processes; formation of administrative process regulations, official regulations for personnel, standards of administrative services and their legal formalization; formation of technical requirements (technical specifications) to creation of e-regulations.

The regulation of administrative processes of service delivery can be based on functionally-oriented and process-oriented models of a management system.

Today's functionally-oriented model of a management system, which was believed to be unshakable and efficient, has become a deterrent of public administration development. The shortcomings of the functional structure are [87]:

– lack of customer orientation (the main consumer of an executive's work results is their boss);

– an excessive number of approvals, which increases the amount of time and effort to get results (red tape);

– an increase in overhead costs: first, the process is divided into many operations, each of them being carried out by a separate functional unit, and then it is approved by the administrative apparatus;

– each unit is an isolated island of management and automation methods;

– a strong orientation of managers towards expansion of staff and complication of the organizational structure (hierarchy);

– underperformance of units due to lack of focus on the end result;

– large share of decision coordination expenditures (according to expert estimates, the operation consumes about 20% of the time, while approval of results – 80%);

– impossibility of rapid response to change.

The lack of incentives to optimize administrative processes, a growing complexity and redundancy of procedures also reflect the characteristics of public service in general. The reasons for this are a large workload and low motivation to change.

The main advantage of the process-oriented approach over the functionally- oriented management model is its focusing on the final result, which allows public bodies to [87]:

– respond faster to the changing internal and external environment, since it is much easier to rebuild the sets of functions when their interconnection is seen;

– orientate the staff for achievement of the final result in administrative service delivery, not for manager satisfaction, as in the case of functional approach;

– cut costs effectively, since working on the processes eliminates duplication and unnecessary expenses for obtaining results;

– evaluate the effectiveness of operations (functions) performed as part of the administrative process, in terms of the process efficiency;

– reduce the process execution time while improving the quality of work performed by eliminating the operations of information transfer along the management hierarchy.

It should be noted that legal acts in the field of regulating a process-oriented model of governance should be based primarily on the level of detailed descriptions of administrative processes (to the level of action, documents, etc.). There must be a link between the administrative regulation for functions and official regulations for public servants. The standards of administrative services act as a projection of the administrative process aimed at the customer of a service and containing only information on points of interaction with a state agency during service delivery.

For the sphere of administrative regulation with the use of e-government technologies, the key concepts are those of regulations, administrative regulations, and administrative e-regulations [38].

A regulation is a set of rules or guidelines for organizing activities, managing a set of processes. An administrative regulation is a set of organizational and administrative documents, designed not only to provide legitimacy, but also to integrate processes, objects and subjects for fulfillment of certain targeted state functions. Administrative e-regulations are also designed for this kind of integration, but with the use of IT to improve their performance.

A study of scientific and legal sources allows defining the administrative regulation through its features as follows: a variety of

legal acts containing a public administrative decision; the effect of public relations regularization; they are developed, adopted and implemented according to a certain procedure; they are intended to regulate and detalize public bodies' activity and the performance of public officials' assigned duties; their purpose is to improve the efficiency of public authorities in securing the rights, freedoms and lawful interests of individuals and legal entities; they result in an administrative procedure; the regulatory acts can be systematized in the form of a set of rules [34].

The important aspects of administrative services regulation are: service design (evaluating the need for its implementation; identifying a service developer, and a service consumer; preliminary assessment of the possible risks, including corruption); creating a flow chart of service delivery (a detailed description of service delivery; algorithms of officials' and consumers' actions); service information support (informing; explaining the process of service delivery, notification of a decision made); correction of services (its maintenance, and delivery procedures).

The introduction of e-administrative regulations makes administrative e-services accessible and transparent, i.e. reduces their corruption component.

Thus, the key objectives of administrative services regulation and provision by public authorities are: improving the quality of administrative services and their accessibility for citizens and organizations; orientation of the public authorities to satisfying customer interests; improvement of administrative processes quality and efficiency by targeting the final result; enhancing public authorities' openness through implementation of open e-administrative regulations; reducing opportunities for administrative discretion of decision-makers; cutting costs of interaction of citizens and organizations with public authorities due to introduction of e-governance; public control of the authorities' exercising their assigned duties.

3.3. The introduction of administrative e-regulations

The problems of administrative regulation of the activities of public authorities and local governments are important in view of the public administration reform and bringing the forms and methods of their performance in conformity with the European standards [34].

By an administrative regulation, we a system of mandatory requirements to administrative processes, their integral actions, decisions, and sequences are meant. In turn, by an administrative process, we understand an action or a set of actions (decisions) taken by an executive authority, its structural divisions and officials, for the purpose of exercising their powers under the law or other legal act, custom or at the discretion of an official.

By an administrative e-regulation, the legal status of which is fixed by a conventional administrative regulation, we mean an e-form

used for execution, analysis and control of administrative actions and procedures, ensuring a public authority's decision-making and/or providing administrative services in the e–form.

The e-form of administrative regulations creates opportunities for a long-term quality improvement of functions and administrative services, reduction of operating costs, shortening of decision-making time, providing services greater information validity. Implementation of the concept of administrative e-regulations enables accomplishment of a consistent gradual automation of administrative service delivery to the extent of a complete exclusion of public authorities' participation in some of the simplest processes.

Implementation of administrative e-regulations should be considered in a close connection with administrative services provision in the e-form. Administrative regulations are a basis for setting of authorities' performance indicators and development of standards for public service delivery by the state.

Reaching the target values is the task of the authorities, departments and officials. These targets are reached as a result of administrative and management processes supported with the necessary resources. Regulations bind together the objectives, functions, and processes with staff, financial, and information resources, specify the order of fulfillment of functions and provision of administrative services, and the procedures for goal-setting, monitoring performance, and setting the mode of information disclosure. Regulations determine a quality scale of performance which is extremely important for public authorities that do not have any objective market performance measures.

Electronic administrative regulations [67]:

– ensure transparency of rules and procedures, thereby expanding the horizon of administrative vision, the ability to plan, control and evaluate activities for the executive branch as a whole;

– define and analyze the activity of state bodies and their divisions;

– represent responsibility within the system of decision implementation;

– minimize the costs of information search and enable a timely generation of the necessary information.

When implementing administrative e-regulations, account must be taken of:

– a sequence of actions and decisions necessary to public functions and provide administrative services;

– a list of structural units and officials responsible for an action or decision;

– allowed options of actions and decisions, and formalized criteria for choosing an option;

– timing of actions and decisions, a maximum time for performance of public functions and service delivery;

– standards for using resources necessary for an action or decision;

– forms and procedures of control over the actions and decisions in exercising public functions;

– an exhaustive list and templates of documents necessary to perform public functions or provide services, the order of their registration and accounting;

– the method of obtaining information by the interested parties on public functions performance and administrative service delivery.

Creation of administrative service standards is a condition for forming administrative regulations and their implementation in the e-form. Inventory and standardization of administrative services and functions, reducing them to a single register will optimize their volume and quality.

All administrative services and administrative e-regulations should be described in the form of technological process models. This implies considering all the process steps from beginning to end, e.g. from receipt of the user request to the time of payment.

Not all the administrative regulations and processes are well-structured and formalized. This is important because the type of a regulation determines the category of technologies that will be used to implement them at the departmental and interdepartmental levels.

In terms of a degree of formalization, processes and administrative regulations can be classified into the following categories [67]:

1. Routine well-structured and standard processes, characterized by a high degree of repeatability and formalization (for example, the process of issuing people's passports). Some of them can be fully automated, with human involvement minimized.

2. Customized processes with a certain degree of exclusivity. For example, marriage registration before legally allowed age. Such processes require much more interaction with a user, and a greater attention from the public servants involved.

3. The negotiation processes, characterized by a high degree of information exchange between the involved parties (citizens, public officials, agencies), whose positions may vary. For these processes, a very complicated, deep analysis and interpretation of circumstances are typical. The examples of such processes are confirmation of nationality or issuance of a building permit.

4. Poorly structured processes, examplified by a process of drafting laws and other democratic procedures.

The categorization of administrative processes into four basic types shows that is not always possible to develop a complete model for a process or work flow (this is particularly true for the three last-mentioned types of processes). For poorly structured processes, collaboration technology, knowledge management technology, information search technology, etc. are of special importantance.

Any administrative regulation and process can be divided into separate subprocesses, operations and microoperations (Fig. 3.2):

– a process is divided into subprocesses, clearly marked with boundaries and information at the input and output;

– subprocesses are broken down to the level of individual transactions, each of them linked to certain actors (civil servants, citizens, information systems);

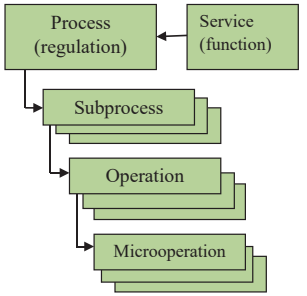

Fig. 3.2. A hierarchy of administrative process procedures

– operations can be turned into a sequence of microoperations.

This decomposition of administrative processes is the basis for the development and analysis of different types administrative regulations. To implement the administrative e-regulations, a wide range of technologies is required, such as: portals of services; content management systems; systems of managing relations with citizens; technologies of multiple e-channels of service delivery; technology of information systems integration; support systems for filling and handling e-forms; process control systems; e-document management systems; e-mailing technologies; collaboration support technology; digital archives; e-records management system; assured e-message transfer systems; payment systems; subsystems of citizen registration and authorization for services in the e-form; digital signature technology, etc.

Apparently, the task of implementing administrative e-regulations is, in fact, that of designing and creating the entire ICT architecture of individual departments or e-government as a whole, if the problem is seen from the national inter-agency perspective.

In general, analysis of a typical, generalized administrative process can detect characteristics, common to many regulations and processes, and based on that, identify the common, basic components and services that are appropriate to implement centrally.

The following services can be regarded as common components:

1. The service of the government (departmental) portal. This may include such centralized services as a full-text search, access of various agencies to the portal sections with a view of adding new information content, etc.

2. The service of content management. This may be a system, ensuring the unity of the processes of information creation and updating, for the portals and sites of government departments in the Internet and Intranet, which will provide the necessary standardization of the publication process and the appearance of documents such as press releases, speeches of officials, interviews, etc.

3. The service e-form documents. It can provide access to e-forms of all documents for citizens, businesses and institutions, for example, in the format of HTML or PDF. The service can ensure implementation of

all steps of work with the forms – completing, signing, encrypting and sending them in the e-form for further processing.

The concept of basic components also presupposes development of certain services and network components that provide a standard means of communication among other basic components and systems of providing administrative services and implementation of administrative regulations. Examples of such integration and infrastructure components are:

– a unified secured telecommunications infrastructure for public use;

– a service of identification, authentication and authorization for administrative service delivery;

– directory services with address information, phone numbers, email addresses, etc. to ensure the interests of all government departments;

– a data security service to ensure a universal interface when implementing a safe, controlled through monitoring and auditing, confidential information exchange of citizens and business with the state, and among the agencies.

The discussed general and basic components provide access to the functions of departmental systems of administrative e-regulations and services. In particular, they are to provide a standard user interface that is easy to remember and use, and the functions of managing users and roles, authentication and registration for obtaining certain administrative services and getting access to regulations.

The introduction of e-administration procedures is based methodologically on the following mechanisms of their implementation: hypertext, scenario, model, and program. These mechanisms are related to the degree (level) of administrative e-regulations [87].

Thus, the hypertext mechanism corresponds to the first and easiest step of introducing administrative regulations, and is related with the transfer of conventional regulatory administrative regulations into the e-form.

The scenario mechanism is implemented on the basis of a description of a sequence of actions (procedures and processes), formalized by format and structure. Flowcharts of administrative procedures and administrative actions can serve as a prototype of this description.

The model mechanism of implementing administrative regulations is based on descriptions of administrative process execution in a special formal standardized language of modeling business processes, independent of any particular software environment and IT.

The program mechanism provides introduction of an administrative regulation for using a specific software application, supporting business processes. It is the highest stage of e-administrative regulations.

An important methodological problem of implementing e-regulations is re-engineering of administrative procedures. The fact is that, according to global practices of implementing information systems in corporations and the public sector, two models are used for business processes re-engineering: "as is" and "as it should be". Introducing administrative e-regulations into administrative practice, the main

efforts of re-engineering of administrative procedures should be focused on the implementation stage of model mechanisms.

First, models are created that reflect the reality of management "as is". Then, after examining all the circumstances and factors that deserve attention, following optimization processes, the "as it should be" models are created. Based on the new models, new legal acts for managing executive authorities and official regulations for public servants can be drawn, administrative regulations taking the lead [29].

Thus, the studies determined that implementation of e-administrative regulations should be considered in close connection with the processes of providing administrative services in the e-form. Administrative regulations are the basis for creating indicators of authorities' performance and development of standards for public service delivery by the state. Creation of standards for administrative services is a condition for forming administrative regulations and their implementation in the e-form.

3.4. Introduction of citizen identification services

Application of mechanisms for citizen identification is to be maintained on the following main principles, formed on the basis of best international practices:

– adequacy of requirements, i.e. the application of the identification method should comply with its intended use (the lower the significance of transaction in terms of changing the rights of an individual or organization, the simpler identifiers should be used);

– decentralization and diversification – these identification systems should involve a possibility of performing an operation in different ways without being tied to a single solution (e.g., to a universal e-card) or any centralized database of identifiers;

– individual choice – an identification system should offer users the means of choice and control of the identification data, which they provide for different transactions, when interacting with various departments;

– explaining the consequences – users should be warned of what their identification data is and for what purpose it will be used in the e-government information systems;

– control of dissemination – access of government departments to transaction in non-government information systems (such as payment), developed on the basis of common identification data is possible only under the court decision or on other legal cirmunstances.

With due regard to these principles and best international practices of citizen identification in the system of administrative service delivery, the identification services should include multiple independent identification options for a free choice of the most user-friendly option. In other words, the unified e-card should be considered only as one of identification means. The identification system should allow for division of administrative e-service transactions into several asynchronous sessions using different identification mechanisms.

By an identification card (also known, depending on a technology used and supported features, as a social card, ID-card, digital passport, e-ID, etc.) we mean an embossed plastic card issued in keeping with the law to certain categories of citizens. Usually the e-card is multifunctional and can be used in particular for administrative services.

Generally, e-cards allow keeping records of personalized information and providing their holders with the following services [80]:

– card user identification in administrative service delivery;

– confirmation of a cardholder's rights to obtain certain types of social aid or get access to certain information;

– obtaining medical services in healthcare institutions that form a compulsory health insurance system, and in pharmacies when buying medications;

– access of privileged citizen categories to services provided by companies of the market of consumer goods and services;

– payment of fares and passenger accounting in public transportation;

– placing money to bank accounts, linked to e-cards payment applications, grants, pensions, allowances and other payments; cash withdrawals from bank accounts; cashless payment for goods and services.

The national e-cards should be unified by: the appearance, design and other structural elements and characteristics; composition of mandatory applications, their structure and data formats; interfaces and data transfer protocols, system commands; requirements to information security; a system, procedures and protocols of card identification, identification of its holder; card lifetime.

Unlike potentialities of e-cards, their real capabilities are not only technological, but also depend on their support infrastructure development, including primarily [80]:

– a network of technical facilities enabling to take cards in places of their potential use (bank ATMs; workstations for public servants and staff of other agencies that use social cards with specialized software; transport pay-gates, etc.);

– communication channels, linking teller workstations with the centralized resource;

– a data processing center that is integrated or interacts with the e-government accounting systems.

Realization of e-card potentialities is also critically dependent on legal support for its use, in particular on whether the card is compatible with the standards of international payment systems. In case of compatibility, a banking processing network with its own developed infrastructure can be used for card handling.

An e-card should be protected from change in data medium, which bears trusted credentials, specialized software, applied software (apps), and graphics (visual data) that are placed on the card surface.

The account information placed on the card usually includes account identification data, namely:

– card identity (number and series, date of issue, expiration date);

– identity of the public authority that issued the card;

– personal data of a cardholder (last name, first name, middle name, sex, date of birth, registration number);

– identity details of specialized accounting systems (e.g. insurance number of individual accounts in the accounting system of the Pension Fund of Ukraine, number of a conpulsory health insurance policy, registration number in social welfare bodies, etc.).

The structure of an application placed on a smart card, comprises:

– an operating system, office applications, security numbers, security software, cryptoalgorithms, etc.;

– social applications concerning the card holder: category codes of social aid recipients, information on the form of social services, period of validity of granted social aid, etc.;

– visual and biometric information (photo and signature of the cardholder, its number, date of issue, etc.).

Foreign countries accumulated certain experience of combining the functions of social cards and identity cards of citizens. However, a standard and generally accepted order of introducing the national proof of identity on e-cards has not been designed as of today, moreover, their necessity and effectiveness is debatable. For example, in the USA, Canada, New Zealand and some other countries, there are no mandatory IDs (either electronic or paper-based), which does not prevent the development of e-government.

At a general level, digital identity cards can be divided into two categories: universal ID cards, specialized cards used in a more or less limited number of cases of interaction with the state.

The range of e-cards application varies from country to country. The most wide-spread cards are designed exclusively for interaction with public institutions of one and the same type (medical, tax, pension certificate). Expansion of the scope of cards application as a universal identity is constrained worldwide by two factors: poor infrastructure for taking such cards; risks to information security and unreliability of personal data protection.

To remove these risks, several methods are used. One of them is to store personal information directly on the card, without creating a centralized register of citizens. When rendering services, government agencies have to address citizens every time, asking them for their personal data, as they have no access to data, the control of which could pose a threat to individual freedoms. Personal data is written to the card using cryptomethods to ensure the exclusion of unauthorized reading or data collection.

The above risks are added, when one card combines the functions of an identity card with features of access to administrative and private services. In the event of loss of such a card, an opportunity of "identity theft" is opened up to the abuser, and to uncontrolled public officials – of intervening into the private lives of citizens. In cases when a person affiliated with foreign countries gets access to the card, these cards can be a threat to the national security.

These concerns are the main reason that deters a wide spreading of multipurpose universal e-cards, despite their convenience.

Today, a generally accepted principle is optionality of obtaining a digital ID card. It is important to note that all the countries (Estonia, Belgium, Singapore), which have implemented the project of a universal e-card, combining the features of identification and access to public services, are characterized by internal stability, a relatively small population, and are compact territorially.

The EU member states have a wide range of policies on e-ID cards. This type of document is mandatory in eight EU countries. However, they are used as a means of e-identification for obtaining online services from the state [55].

A general trend of using electronic digital signature as an additional function of e-identification in the ID card format to identify its owner is to give the right of choice concerning this use to the public.

A special issue is that of e-identification of legal entities. Most EU member states require that legal entities register in the so-called Commercial Registry (similar to the United State Register of Legal Entities, Individual Entrepreneurs and Public Organizations of Ukraine). During registration, each company receives a number that uniquely identifies it.

Unlike citizens, companies do not act by themselves, they are represented by officials. However, the majority of the EU member states use e-identification tools specific to business establishments. Most of these tools are hardware keys containing a qualified e-signature certificate. These means of e-identification can be used both for authentication and for signing documents on behalf of a company. Noteworthy is that, although these means of e-identification can only be used to represent the company, they are nominative, i.e. contain the identity details of representatives.

Most of these tools are specific to particular sectors (financial, administrative, legal, banking, healthcare, etc.), and tools used in different sectors are not interchangeable.

For e-identification of legal entities when making online transactions, an e-stamp and qualified e-stamp can be used as an e-signature substitute.

The use of a qualified e-stamp allows e-identification of legal entities with a high level of guarantee, provided public key infrastructure and certified means of creating a qualified e-signature are used. According to this scheme, a qualified provider of trusted services acts as a provider of e-identification.

It should be emphasized that in Ukraine the concept of using e-seal as a special type of electronic signature was introduced at the start of electronic system development as early as 2004 [55].

It is very important to introduce alternative means of e-identification, such as mobile equipment identification (mobile ID), giving users a choice and making e-identification infrastructure more flexible and attractive from the end user perspective. It is essential to implement the

mechanisms for registration in the portal of administrative e-services, alternative to a qualified e-signature.

The introduction of alternative means of e-identification is one of the incentives to increase the extent of e-services penetration into people's lives and businesses which is relevant to the present day.

Thus, the conducted research shows that the use of citizen identification services should be based on the following main principles: adequacy of requirements, individual choice, explaining consequences, controlled dissemination. Identification services should include several independent identification options with a possibility to choose the most user-friendly option. The unified e-card with electronic signature should be considered only as one of identification means. The system of identification should allow for division of a transaction in administrative e-services into several asynchronous sessions, using different mechanisms of identification.

CONCLUSIONS

Analysis of international experience shows that there is no single successful program of e-governance or e-democracy. Every program or strategic plan should be individual and take into account the specific characteristics of each country or region. For most countries across the world, the development of e-governance and e-democracy is one of the priorities and is regarded as a task, common to the whole nation. Information and communication technologies are assigned the role of a tool indispensable to social and economic progress, one of the main factors of innovation development of the economy. E-governance and e-democracy provide for the most effective and rapid increase in competitiveness of the national highly-intelligent work; improvement of the life quality; promoting the development of an open democratic society.

The conducted research made it possible to determine the system of e-government mechanisms comprising five groups: security mechanisms in cyberspace, mechanisms of e-interaction, mechanisms of e-services, mechanisms of e-democracy, and open government mechanisms. For each group, a detailed classification of mechanisms facilitating e-government was defined. A characteristic feature of the presented structure of mechanisms is their interconnectedness, which determines a systemic and comprehensive approach to e-governance mechanism introduction.

The mechanisms of e-interaction ensure the information interaction of the authorities in the e-form for administrative services delivery and performance of public functions. The results of e-interaction can be obtaining information, providing counseling, or making a management decision. By the level of interaction, e-cooperation can be classified into unilateral, interactive, and transactional. The unilateral e-interaction implies: informing the public about the public authorities' activities; providing information about the legal support for the authorities' activities; timely publication of official data; opening access to public information and open data; formation of reporting e-forms and assisting with the rules for their filling. The interactive e-communication provides two-way interaction with the public authorities using e-communications. In the course of online interaction a user can address a specific request to government agencies and get a concrete answer about their problems. The transactional e-interaction provides access and and subsequent realization of online operations (transactions) of e-service delivery to specific natural or legal persons only after the latter meet the requirements for identification and authentication.

The mechanisms of e-service delivery are key components of e-government systems. They can be classified by components into administrative, institutional, integrative, service. The administrative mechanisms for providing e-services are based on introduction of e-administrative regulations, processes, procedures, functions, information maps and implementation sheets. The introduction of

e-administrative regulations is an innovative process, a new approach to analysis of the administrative processes structure, and search for new models of government structures' functioning. The institutional mechanisms for providing e-services involve modernization of public administration at all levels. Implementation of the integrative mechanisms for e-services improves the quality of service delivery and shortens the procedures for obtaining public services.

The service mechanisms of e-services are related to the efficiency of detection, modeling, and meeting the individual and group interests and needs of citizens. For a service organization of management, the dominant indicator of high performance is customer satisfaction with services. The integrative mechanisms for providing e-services are based on implementing the principle of one window in public service delivery. It is intended to exclude or limit to the maximum the applicants' participation in collection of documents and information from different authorities and submitting them to other agencies in order to confirm their right to receive services.

Studies indicate that the development of e-democracy is based on introduction of a set of interrelated mechanisms: network communication; e-voting; inquiries and requests of citizens; e-petitions; network crowdsourcing; online evaluation; e-participation; formation of online communities; automated monitoring. Today, there exists a problem of introduction of interactive communication technologies, e-participation of citizens in social and political issues. The tool of network control over the activities of public authorities is also problematic, since it includes not only a continuous monitoring of unsolved problems in the housing and communal services, education, medicine, etc. and informing the authorities about these issues via e-technologies, but also observation of the very procedure of developing and implementing the decisions taken by the authorities with citizens' participation. Analysis of research and publications allows concluding that the development of e-participation as an active element of e-democracy is a global trend. This trend of social life is formed not only by the state agencies, but for the most part, by public organizations and movements, as well as by citizens themselves.

A methodological basis for the strategy of developing e-administrative service delivery is the service concept of public administration. According to this concept, e-administrative service provision becomes a key feature of a service state. The main components of the strategy of e-administrative services system development are: simplification of administrative processes, streamlining administrative services, decentralization and development of integrated services. There are a number of problem issues, settling of which would facilitate online service delivery, including: the general terms of administrative service delivery through the use of e-tools and e-communications are not defined by law; there is no clear division of power and responsibility for provision of e-administrative services among different authorities; the legal status of government information resources provided to e-administrative service recipients is undefined; the legal terms of

personal data protection in providing e-administrative services are not defined.

To ensure development of the infrastructure for administrative service delivery to citizens using e-communications, it is advisable to provide for: creation of online services on the websites of administrative service providers to make the administrative service system more effective; development of regional centers for administrative services to expand the e-service infrastructure of interaction between service delivery subjects; improvement of the unified state administrative services portal where any citizen can obtain all kinds of administrative services without any restrictions.

During the research, a necessity for changing a paradigm of building services for e-administrative service delivery was substantiated. It is necessary to restructure services on the principles of human orientation, forming an integrated digital environment of the life of citizens and organizations with a continuous growth of e-administrative service quality, reducing costs of functioning and optimizing cooperation between the state and local governments, getting citizens involved in the governance processes.

As a result of the conducted research, the service mechanism for e-administrative service delivery has been improved. This e-administrative service mechanism is related to the efficiency of determining, modeling and realizing individual and group interests and needs of citizens. Its content and components are defined as a set of services, namely: identification and authentication, collaboration and integration, single personal cabinet, transactions, monitoring services quality, information and instruction. Implementation of the service mechanism for service delivery should be based on convenience and predictability of procedures for interaction of customers with the authorities. Service delivery procedures should meet citizens' reasonable expectations, resulting from their experience of interaction with organizations operating in the business field. Interfaces that support interaction with service providing bodies should be user-friendly and clear. Designing the interaction regulations and interface elements, and evaluation of clarity and user-friendliness of the implemented procedures should be carried out by studying the scenarios of citizens' behavior through polling methods. Requirements to procedures of service delivery, aimed to ensure their convenient and understandable use, must be secured by laws. The basic services of e-administrative service delivery include: identification and authentication service, interaction and integration service, service of a single personal cabinet, transactions service, service of monitoring services quality, information and instruction service.

The key objectives of administrative services regulation and provision by public authorities are: improving the quality of administrative services and their accessibility for citizens and organizations; orientation of the public authorities to customer interests satisfaction; improvement of administrative processes quality and efficiency by

targeting the final result; enhancing public authorities' openness through implementation of open e-administrative regulations; reducing opportunities for administrative discretion of decision-makers; cutting costs of interaction of citizens and organizations with public authorities due to introduction of e-governance; public control of the authorities' exercising their assigned duties.

Application of citizen identification services is to be maintained on the following main principles: adequacy requirements, individual choice, explaining consequences, control of dissemination. Identification services should include several independent identification options with a possibility to choose the most user-friendly option. That is to say, a unified e-card using electronic signature should be considered only as one of identification means. The system of identification should allow for division of a transaction in administrative e-services into several asynchronous sessions, using different mechanisms of identification.

Thus, as a result of a thorough research, a system of interrelated mechanisms of e-governance and e-democracy has been proposed; the methodology for development of an innovation-oriented society is substantiated; innovative technologies and mechanisms for e-communications upgrade are provided; the methodology for e-administrative services regulation and rendering is grounded; practical recommendations on optimizing a service-oriented state infrastructure are given.

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