# The Ministry of Education of the Republic of Azerbaijan

## THE ROLE OF THE ICT IN EXPPANDING ECONOMIC OPPORTUNITY

Farid Rustemov

1511209001111008

Thesis advisor

Aysel Quliyeva

Azerbaijan State University of Economics

UNEC SABAH

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# ABSTRACT

Today, there is a process of transformation into an information society in the world. In general, the process of globalization plays an important role in this process, in which technology, in particular, is a major contributor to Information and Communication Technologies (ICT). The object of research of final qualifying work is the relations developing in the sphere of use and development of ICT in the implementation of business processes. The subject of the research is information and communication technologies in their historical development, and the possibilities of their application in the implementation of business processes, including at enterprises. The aim of the work was to study the place of information and communication technologies in the world economy. When writing the final qualification work, the following research tasks were set: to study the theoretical aspects of the information and communication technologies sector; to reveal the features of the current trends in the sector in the world.

Key words: ICT, Economy, Development

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# I. INTRODUCTION

Today, there is a process of transformation into an information society in the world. In general, the process of globalization plays an important role in this process, in which technology, in particular, is a major contributor to Information and Communication Technologies (ICT).

The emerging information society is experiencing the development of high-speed communication networks and some basic services carried on these networks. These services may include traditional voice, data, video services as well as multimedia services. In such a network-based economy, the driving force of economic growth and development is confronted by information rather than natural resources or physical assets.

In the process of transformation into information society, national economies are becoming increasingly more knowledge-based economies. The economics-based economy describes the economies in which knowledge is created, spread and used by firms, organizations, individuals and societies for further social and economic development.

Historically, the ICTs, also referred to as techno-economic paradigm shifts, have seen software, computer, microelectronics, TV, etc., especially since the second half of the 1950s. With the rise of the industries, the effects of the economy have begun to become more and more evident. Unlike technologies that have widespread influences such as power, power and electricity, they have a much wider range of impacts. With the emerging technical developments, the ICT sector has made rapid improvements in the price-performance ratio of capital goods, and the ICT sector has reduced the cost of capital goods relative to other capital goods. This, in turn, has led to a greater use of ICT capital goods, and thus to an even greater increase in the eco- nomics of

the economy. Thus, as Meares and Sargent point out, while these technologies change our lives and our way of working, they also transform the economy from its foundations.

It is important to be able to establish a general framework for establishing the relationship between the information economy and the labor market which constitutes the subject of this work. In terms of the formation of this framework, it is necessary to examine it in many dimensions. The process of transformation to the above mentioned information economy can be understood as the forms of cooperation between the public and private institutions, such as growth and growth theories, productivity, R & D, firm organizations, employment, human capital, new products and consumption patterns, industrial relations, inequality, public policies, the reflections in quite different areas are a matter of increasingly intense debate.

Below is a brief description of the relationship between these areas and the information economy. A knowledge based economy is defined as a economy that is directly based on the production, distribution and use of knowledge. While knowledge has been a very important factor for economic growth in the past, economists are now discovering ways to incorporate information and technology into the theory and models more directly. In this context, "new growth theory" is regarded as an effort to understand the role of knowledge and technology in productivity and economic growth.

The object of research of final qualifying work is the relations developing in the sphere of use and development of ICT in the implementation of business processes. The subject of the research is information and communication technologies in their historical development, and the possibilities of their application in the implementation of business processes, including at enterprises.

The aim of the work was to study the place of information and communication technologies in the world economy.

When writing the final qualification work, the following research tasks were set: to study the theoretical aspects of the information and communication technologies sector; to reveal the features of the current trends in the sector in the world.

## 1.1. LITERATURE REVIEW

To achieve this goal, it is necessary to solve the following tasks.

First, consider the theoretical foundations of the concept of ICT, such as the essence, classification and economic significance. Secondly, to analyze the state of ICT in the modern economy by the example of Country in general and the Republic of Tatarstan in particular.

The object of research is the diverse and multifunctional impact of information and communication technologies and its economic significance in the conditions of the modern economy.

The methodological basis of the course work contains a number of theoretical and methodological principles and approaches, including such research methods as analysis and synthesis of phenomena, statistical, systemic. The structure is determined by the purpose and objectives of this study. It consists of an introduction, two chapters, a conclusion and a bibliography.

Theoretical bases of information and information services market are presented in the works of Bereza NV, Gasparian MS, Seletkova SN, Dneprskaya NV, Yaseneva VN. and etc.

# 2. THEORETICAL ANALYSIS
## 2.1. THEORETICAL FOUNDATIONS OF ICT FORMATION AND DEVELOPMENT IN MODERN ECONOMIC CONDITIONS

From the nineteenth century, especially from the second half of this century, the Industrial Revolution brings about radical social changes and upheavals on the one hand and important technological leaps that accompany those changes on the other. In this period, the "mass media" - the popular press in the 19th century, and radio, cinema and television in the 20th century - spread to a wider segment of the society, but also to the academic interest in understanding and explaining the social changes that the Industrial Revolution has opened.

In describing "the new society where the masses come to the city," the "mass media" and the relationship between the individual and society are questioned on the basis of the influence of these instruments on the social life (Абдрахманова , 2009, 43-44).

Among the earliest US-based communication studies, micro-scale sociological surveys, where the Chicago School of pragmatist understanding embraces the issue of immigrants' participation in American society, occupy an important place. John Dewey, a representative of the school, views Robert Park and Charles H. Cooley's work as instruments of mass media, "ideal democracy" and cultural assimilation, and therefore of communities as an integral part of an industrialized urban formation. Technology is dealt with on the axis of optimism and progressive insight from the instrumental perspective while society is conceived as an organism in which people come together and connect with each other in transportation and communication networks. For example, according to Dewey, "the new technology

applied in production and marketing has led to a social revolution": indeed, "mass production, cable and telephone, , railways and steamed maritime transport stamps" (Аксенов, 2013) . According to Dewey, who positions technology as the engine of social change, technological change inevitably brings human and social progress to siege. As Dewey finds the technologies as problem solving tools, the tools change as the problems change. This instrumental perspective also applies to communication, which Dewey defines communication as "vehicle" and "destination" uniquely. This understanding, which advocates that society exists through communication and communication, positions communication as a fundamental condition of the society and the operation of democracy. So much so that according to Dewey, although steam and electricity technology created the Great Society, it is not a community. In his 1927 dossier, The Public and Its Problems, he states: "We have physical means of communication as never before. Consistent thoughts and desires are not in communication, therefore, they are not universal. Without communication, the public will remain irregular and uncertain. For this reason, "only communication can create a great community"( Бурков, 2013: 108).

Park similarly identifies communication as a symbolic process, and emphasizes that this process is a form of interaction that also includes the potential for reconciliation and conflict. But, ultimately, in the long run, argue that this interaction will inevitably lead to a deeper meaning, hence a social consensus. It is possible to say that this conception, which positions communication as an essential element of the social change process, involves a certain level of criticism in the view of the "atomic individual". But since communication is defined only through individual and cultural encounters, this process is isolated from the social material conditions (Бухаркина,2014).

As a consequence, existing power / power relations and conflicts embedded in communication are neglected. While acknowledging the problems of the existing social structure in the framework of pragmatist tradition, it is confined to introducing various breeding measures related to the needs of the industrialized society and the destructive consequences it produces(Валеев , 2013). Nevertheless, these studies give a limited criticism of criticism as the ideal democracy understanding and search look at the normative. The limitations of their criticality arise not only from their definition of power as an individual phenomenon, but also from the fact that they ignore the existing social construction and the conditions that pervade the development of communication technologies, and therefore the wider economic and cultural structure. If it is to be expressed by Babe's statement, the fundamental shortage of the Chicago School is to deny possibilities such as domination and subjugation through technology, and thus deny existing social and economic conflicts. For this reason, the approach they set out calls for naïve technological optimism about the relationship between social change and technology.

A number of empirical studies have been conducted in the world that address the relationship between information and communication technologies (ICTs) and economic growth. From these studies it is possible to summarize the main results of the heads as follows.

The ICT sector's investments increase productivity and direct economic growth by increasing capital intensity by contributing to capital deepening (Варнавский, 2013, 15-18).

ICT is a general purpose technology; it is used near all of the other sectors, triggering technological developments and innovation activities.

It takes time for the effects of ICT investments to emerge.

In developed countries, ICT production, investment and use have had a significant positive impact on economic growth.

There are contradictory views on the impact of ICT investments on economic growth performance in underdeveloped and developing countries. Along with the widespread use of information technology and the increase in data availability, there have been many studies showing that there is a statistically significant positive relationship between information investments and economic growth for the developing countries and economic growth.

The degree of contribution of ICT to economic growth is also related to the level of ICT utilization in all economies. The economic consequences of the ICT revolution are also dependent on factors such as socio-cultural elements, human capital structure, the existence of knowledge-based business processes and complementary physical infrastructure.

### 2.1.1. ICT: subject scope of research

Along with the change that has taken place in the field of information and communication technologies (ICT), innovation and innovation have led to some unpredictable ethical problems in the virtual world. The traditional forms of communication in social systems and responsibilities make interaction with ICT questionable, failing to secure the interaction in the virtual environment.

With the reflections of the life of the ICT, it is a fact that the frontier has been recognized as a new area of interaction and culture that has no place in daily life. This reality indicates the necessity of bringing new solutions to these problems by pointing to the existence of some new and important ethical problems. From this point of view, it is necessary to carry out a multifaceted examination of these new problems

in order to define an awareness and solve the related ethical problems from the source to the result (Васильева, 2013: 69).

In order to be able to perceive the ethical problems that arise in communication through virtual environments, it is important to examine the studies done in the field of computer and internet ethics first. In addition to adopting various approaches to researching and defining ICT ethics, ICT ethics in general; efforts to investigate the social implications of computer technology and to develop appropriate formulas and applicable policies to enable the use of computer technology for ethical purposes. Such development efforts are advancing to set the basic standards for the ethical use of information technologies.

Mason determined that unethical behaviors arise within the framework of intellectual property, secrecy, access, and accuracy factors by evaluating the ethical problems that emerging technological developments under four main factors. Progressive research has shown that these factors, as well as the social effects of computers, safety, quality, information and network integrity factors, also affect the emergence of unethical behaviors (Вейлер, 2011: 75).

Intellectual property concerns who owns the control of the information at the same time as it determines who the real owner of the information is and how it should be used by others. With the introduction of proprietary information into the virtual environment, the protection of intellectual property rights became difficult and this brought with it the difficulties of security, access, privacy and accuracy. High security measures must be taken to ensure confidentiality in digital media, and it is important to give priority to the correctness of the information in order to ensure security.

Technology-ethical relations, information studies, human-computer interaction, and media studies are considered in the context of

different research areas depending on the rapid development in technology. Most of the ethical studies seem to adopt two approaches. These; Examination of the use of ICT in the context of virtual world behavior everyday unethical behaviors are proceeding as a reflection of these behaviors on the use of ICT (Вершинская, 2008: 64).

Friedman has conducted a study of the aspects of copying software and accessing computer files. In this study, the researcher used a method of comparing and comparing property, confidentiality and security related behaviors related to ICT, non-ICT property, confidentiality and security behaviors. From students' behaviors related to ICT; the software asks for the copying for personal use in copying, copying for copying and copying for profit, and comparing the behavior of unauthorized removal and use of the place where the bicycle is located, expressing ownership of daily life. In the other phase of the study, students were asked about behaviors related to ICT; accessing computer files, accessing computer files for reading purposes, and accessing computer files for alteration purposes; to read someone else's unauthorized diary or to read an open letter reading on someone else's line (Горбунова, 2014: 22).

The most important result of the work is that the privacy and security rights of property and computer files in the field of ICT are not seen as daily living property, privacy and security rights not related to ICT. While students emphasize the mistake of playing bicycles, they often do not mind opening their computer files while copying software and not approving to look at the letters of others. 97% of the students share the view that reading someone else's diary is not the right behavior and that the diary is secret, while the rate of computer files is 66% when it comes to confidentiality (Горбунова, 2013: 15).

While 57% of the respondents stated that unauthorized access to computer files was wrong, the rate of students who expressed the error of reading the open letter on the order of others was 90%. In addition, only 25% of the students think that software and programs are the ones that should be considered under the privacy rights. The researcher, as a basis, has shown ethical sensitivity. The research also pointed out that there is no difference between opinions based on sex. Researchers consider situations such as the lack of fear of apprehension, the spread of copy software usage around the world, and the lack of consideration of copyrights as factors in the increase in unethical behaviors in the ICT sector. There are some reasons why it is not possible to realize the negative consequences of unethical behaviors in the ICT sector. These; the simplicity of copying the software, the damage caused by the criminal and the difficulties of the wounded party, and the perception that the victim will not experience any adverse event if he does not recognize the fact.

Uysal examined teacher candidates' views on computer ethics in their research in terms of gender, income level, programs they have studied and computer use experience. In the study, opinions of 559 teacher candidates were included in the data collected using "Non-Ethical Computer Behavior Scale (Грязина, 2011: 121)". Among the results of the study, there was an increase in the rate of unethical behavior on property rights issues, depending on computer experience. In other words, those who are experienced in using computers more frequently apply unethical behaviors.

Moreover, it has been shown that this situation is not related to the socio-economic level. Another important result is that women are much more sensitive to show ethical behavior when using ICT than men.

Erdem examined the dimensions of intellectual property, social influence, security and quality, network correctness and information correctness by developing an 80-item non-ethical behavior scale in his research with 555 teacher candidates. Among the results of the study, the participants were more unethical behaviors in computer use than in the ones with the lowest ones. For example, teachers of information technology teachers tend to be more unethical when they use computers according to social studies teacher candidates. A similar result has been reported for teachers of science and information technology in another study. On the other hand, some demographic features such as age, foreign language level, internet usage frequency and income level of participants did not have a meaningful effect on the ethical use of information technologies.

When the related literature is examined, it is seen that the ICT issue has a wide range of effects and is closely related to the environmental factors in addition to the interaction behaviors in the virtual environment. Are people really aware of the unethical ICT behaviors they observe in their environment? If this awareness of consciousness arises, do people choose to move away from these behaviors, or do they continue to exhibit these behaviors themselves if they are aware? In the estimation of non-ethical behaviors and in the way of the emergence of these behaviors, it would be a right approach to study both the source of these behaviors and the influence of the environment. This study aims to reveal the frequency of non-ethical behaviors in the use of ICT in the environment and to show the relationship between the situations in which people exhibit related behaviors in this direction (Даниялова , 2014: 18-20).

ICTs provide new opportunities in the production of new goods and services, as well as economic efficiency created by technology. ICT,

high productivity and organizational change have started at the firm level. The most important complementary value of ICT is the increase in productivity and the decrease in cost resulting from the effect on the business processes and the way of doing business. At firm level analysis, abstract organizational investments and goods and service innovations emerging with ICT are addressed. From this point of view, the difficulties of analyzing at the aggregated level about how the economic contribution of computers will be at the macroeconomic level are addressed. It is difficult to arrive at definite judgments about the benefits of private enterprise level benefits to the total social benefit and the economy as a whole, and their contribution to growth. However, it may be possible to measure benefits when abstract capital assets are accounted for in the total capital stock and computerization of the economy. It is said that the living productivity explosion originated from the abstract capital.

Electronic based ICT is concerned with transfer rate and capacity and storage of data. The development of the first revolution in this area is the change in the information processing power, summarized by micro-engineering, macro-changes, as defined by Moore's Law. Scientific and industrial pioneers of electronics-based information technologies Along with the developments in World War I, the development and spread of the internet in the 1990s accelerated the development. Today, investments related to ICT have an increasing share in GDP (Дмитрик , 2011).

## 2.1.2. The role of ICT in the present economy

In an innovation economy based on knowledge, an important task is to assess the level of development of information and communication technologies (ICT) both in the world and in a separate state. The

penetration of ICT into various sectors of the economy is the basis of their competitiveness. ICTs in interaction with other sectors of the economy introduce new solutions, new technologies, new management systems that increase labor productivity. Economic models indicate that 96% of the increase gives scientific and technical progress. Information and communication technologies are the engine of scientific and technological progress.

The ICT sector is a type of activity that includes organizations engaged in the production of goods that are associated with the registration, processing, transmission, reproduction and display of information in electronic form. This definition of ICT is based on approaches (Егоров, 2015).

Throughout the history of the development of human civilization the main:

the object of labor remained material objects. Economic power,

The state was measured by its material resources. Currently,

The situation is changing, information resources are being added. Active

information resources is that part of national resources,

which is the information available for automated search,

storage and processing. Note that the main properties of good

information is actuality, reliability, completeness, adequacy,

availability. Information technologies in the sphere of economics are used

just in order to process the data into a reliable, operational

information for decision making with the help of hardware and software

means, in order to achieve optimal market parameters of the object

management. You can give a textbook story about how Rothschild

made a fortune on the defeat of Napoleon at Waterloo on June 18, 1815.

Rothschild knew about the defeat of Napoleon, although all the rest were sure of

the reverse. And then he began to immediately sell his shares on the stock exchange. Followed

for it all began to sell. As a result, securities fell almost to zero. At this point, agents of Rothschild bought up shares at the lowest price. This is a vivid example of the competent use of current information.

With the advent of personal computers and the proliferation of the Internet, the speed and volume of information received increased dramatically. In this regard, the boundaries of the modern office have significantly expanded due to the success in the development of wireless technologies. As a result of the development of wireless technologies, such as Wi-Fi, 3G, as well as a promising generation of mobile communication 4G, you can connect to the Internet almost everywhere. And the Internet, in turn, is a storehouse of knowledge, a means of learning, a tool for doing business, and much more. The active connection of consumers to the Internet caused the development of electronic business. Areas of application of electronic business are significant, such as: electronic commerce, banking operations, insurance operations, purchase and sale of various products, operations on the stock exchange, IP telephony, etc. Let's stop briefly on some of them. Banks offer account management services and payments in real time at any time of the day. The Internet shops operate round the clock. The network began to conclude transactions. The Internet has become a simple and convenient means of communication between supplier and

consumer (B2C) and communication between entrepreneurs (B2B). Business-to-Consumer, Customer (B2C) or business customer is a kind of e-commerce related to e-commerce transactions produced between the enterprise and consumers.

Business-to-Business (B2B) is an electronic commerce between entrepreneurs, the main feature of this type of e-commerce is the automatic interaction in electronic form of enterprise management systems.

The advantages of using e-commerce are (Жучков, 2014: 241):

- Easy to deploy and manage applications. It's easy to use the Web. Buyers should only master the program for viewing, and they immediately get access to electronic trading tools.

- Reducing the time for delivery of the goods to the consumer is one of the necessary conditions for conducting successful trade.

- Reduction of time spent on purchasing the necessary goods.

- Unlimited growth in the number of potential customers. When using the Internet, you can expand the sales market for the account of foreign buyers.

- The information on the product can be presented on the Internet in various forms. Web allows you to transfer not only text, graphics, but video and voice.

- The ability to identify the buyer.

- Minimization of personnel costs and rental of premises.

- Possibility of round-the-clock access.

Electronic business, unlike any other, requires minimal investment. Thanks to information technologies, the level of economic opportunities in the sphere of industrial production, as well as in various branches of production activity, has sharply increased. But the whole situation with economic commerce remains rather complicated because

of the small business activity of our population. Online stores, as well as other forms of e-commerce, should take their place in the 21st century. And I am sure that this technology will replace many modern types of commerce.

But we must not forget about information security. The term "security" in the law "On Security" is defined as "the state of protection of the vital interests of the individual, society, the state from internal and external threats". Information security as an integral part of the economic security of entrepreneurial activity includes (Хохлова, 2012: 70):

a) a comprehensive program to ensure the security of information resources of the enterprise;

b) an economically sound technological protection system that ensures the proper level of security, availability, reliability of information systems and information security.

Along with encryption, the following security mechanisms are implemented:

a) digital (electronic signature);

b) access control;

c) ensuring the integrity of data;

d) ensuring authentication.

The domestic IT market has been developing dynamically in the past few years, according to experts, its growth exceeds 10% per year. At the same time, the information security sector is developing at an even faster pace - more than 25% per year.

Thus, the main thing is not only to correctly use the available information, but also to provide high-quality protection of this information in all available ways.

The global information technology market is developing at a rapid pace. An impressive example is the Asian countries that have made

bets on the development of ICT production and were able to bring their economies to the forefront of the world market. Well-known successes of Japan and Korea, whose world-famous companies symbolize the progress in information technology (Ирхин, 2009: 164).

The purposeful state policy of India in the field of production of a software product on orders of foreign companies allowed to increase its volume to 10 billion US dollars and brought the country among the new leaders of the world ICT market. In recent years, China has rapidly developed its ICT production, whose products and services are beginning to compete with traditional producers.

At present, the volume of the world information technology market is about 1 trillion. USD. The development of information technology has become an important factor in the life of the world community. Their wide distribution is transformed by everyday life, leads to revolutionary shifts in the economic, social and cultural spheres, stimulating the processes of transition to a new economy-a knowledge-based economy.

At the end of the last century, the contribution of the ICT sector to GDP growth in the United States was 30 percent, while the contribution of the construction industry did not exceed 15 percent, and the automotive industry-5 percent. In 2011, ICT in Singapore's GDP was 24.7 percent, Brazil 6, 7%, Country 3.9%, the Republic of Tatarstan 3.5%, and ICT per capita in Singapore at $ 11,000, Brazil $ 737, Country $ 393. USA(Крылов, 2011: 34).

According to the global report on ICTI 2011. The World Economic Forum among the 142 surveyed countries, Country in this indicator took the 56th place. Compared with 2010, Country has improved its position by more than 20 points, rising from 77th to 56th place. This was mainly due to such indicators as cellular penetration (7th

place in the rating), adult literacy (9th place), price level for fixed Internet access (17th place). Despite this, weak places left the Countryn companies' low sensitivity to the introduction of new technologies, the inefficiency of the legal system and, in general, the underdeveloped IT market.

The analysis shows that at present there is still a "digital divide" in the world between developed countries and those countries that have not yet fully taken full advantage of the new information and communication technologies.

In order to fully understand how this "digital revolution" can stimulate economic growth and development, it is necessary to understand several of its main features. First, it created an absolutely new economic sector, which was simply not there before. Secondly, the capital that plays the leading role in the "digital revolution" is increasingly intellectual capital. Of course, the required intellectual capital is not available everywhere, but in Country it is still present in sufficient quantities and is much more widespread than financial capital.

This position of in the modern world corresponds to its intellectual-personnel and scientific-technical potential. So, in terms of the number of scientific engineers per million population, outperforms high-income countries. Its share is also relatively significant in patent applications (2.6%). However, despite the sufficient amount of intellectual capital, the share in license revenues is only 0.08%. This testifies to the anti-innovation orientation of the neoliberal market reforms implemented in the country. This situation with the development of public administration by the ICT authorities has become a cause of concern for society.

There are two approaches that determine the formation of information and communication technologies (Мирясов, 2008: 30):

- information and communication technologies as a factor of production, that is organization of processes of distribution, exchange, consumption, production of ICT, ICT-related products and ICTs;

- information and communication technologies as a catalyst for social and economic development, that is, an accelerator in the development of the economy, with this approach, ICTs are seen as a tool to meet the objectives of the large-scale dissemination of information and communication technologies in the economy and society.

ICTs have caused significant changes in almost all spheres of human activity, particularly in the economy, employment structure, education, health care, etc. However, because of the rapid development of the ICT industry, little data has yet to be explored so that it is possible to predict the growth, productivity of labor and the impact of ICT on the economy

Many scientists agree that information and communication technologies contribute to economic development, discussions raise questions to what extent and how. So in 1987 the R. Solow expressed the observation: "The computer era is visible everywhere, but not in performance statistics". This phenomenon "computer paradox" or "productivity paradox" expresses the tendency to increase investment in the computerization of production, which leads to an even greater investment in information technology, rather than an increase in productivity and profit. However, research in the US on the growth of labor productivity in the late 1990s was associated with information technology, namely, investment in this industry in the first half of the 1990s. Data from the Organization for Economic Cooperation and Development (OECD) from 1995-2005. testify to the belated influence of ICT on the economy: providing a 60% increase in productivity due to information technology (Овчухова, 2013: 37-39).

The interconnection between information and communication technologies and labor productivity, being a discussion issue, receives more and more data confirming this point of view.

The massive emergence of information products and services contributed to the formation of an information market that has its own characteristics, problems and development tendencies, but, undoubtedly, has a significant and constantly growing impact on the general economic situation in the country.

Information and communication technologies, in addition to influencing the economy, have a stable social and social effect. After the discovery of this ICT capacity, many governments began to implement large-scale programs, in order to improve the level of provision of educational, medical, and various kinds of public services to citizens. However, in the process of implementing these projects, significant amounts of investment resources are needed, as well as the transformation of state regulation and the search for trade-offs with entrepreneurship.

Dissemination of ICTs and use lead to changes in the level and quality of life of the population (Пресняков, 2011: 132):

First, create new jobs in the ICT industry itself, and in the sectors of the economy in which these technologies are used;

secondly, the quality of goods and services increases, their cost decreases;

Thirdly, new jobs are created primarily in the service sector, thanks to the growing incomes of the ICT industry workers, as they increase the costs of goods and services, and generally have a positive impact on the economy;

Fourth, the rationalization of the management system, the implementation of a system of transactions using ICTs lead to an increase in free time;

Fifthly, income is redistributed through remittances between economies, entities, as well as labor migration from more economically developed to less developed territorial entities;

Sixth, new types of working relations are formed, employees participate in the work process at home, in the park, in another country, there is no longer such a link to the geographical location - the office, the independence of employees in the formation of their working schedule increases;

Seventh, the population is increasingly using distance learning;

Eighth, thanks to ICT, the qualification of employees is constantly improving, and as a result, training of specialists is improving, which opens new horizons for personnel management in companies and institutions, and, therefore, the opportunities for production growth. In turn, for each employee this means a more successful and dynamic career, which generates a greater motivation for work.

Analyzing the capital market, it can be seen that, under the influence of the wide spread and use of ICT, it becomes mobile, losing its nationality. A big role in this was played by the use of electronic payment systems, information is transferred from one account to another at all levels.

Currently, investment in the ICT sector is the main incentive for the economies of developed and developing countries. Since information technologies contribute to the growth of the economy's efficiency in the long term, countries in which the ICT sector is most developed are also more competitive.

Information and communication technologies have great potential for stimulating social development. By the nature of ICT, universal, flexible, and this means that they can be used to solve a variety of problems of economic development.

The ICT industry occupies one of the central places in the world economy largely due to the fact that it exerts a tremendous influence on the collection, processing and transmission of information, one of the most important resources of the modern economy. Modern conditions are such that information is the primary basis for making practically all significant decisions in the company.

# 2. MODERN TRENDS OF ICT INDUSTRY DEVELOPMENT: VOLUME, DYNAMICS, PROSPECTS

Modern trends in the development of the world economy are associated with the growing role, information technologies and knowledge in the economic life of society. The economy is changing, becoming more innovative, and at the heart of these changes is the use of personal computers, high-speed telecommunications and the Internet. The most competitive today are those countries that are able to constantly improve with and take into account technological innovations. At this stage of development of our country it is important to take our place in the global information space. The development of the information and communication technologies (ICT) sector can increase the competitiveness of the economy on the world market, and will also

help to bring the country to a new level of development characterized by intensive structural shifts in favor of a high-tech information sector.

As was noted by the President of the Republic of Uzbekistan IA. Karimov: "Recognizing the special and important role of ICT in the economy and society, in 2013 the Comprehensive Development Program of the National Information and Communication System of the Republic for the period 2013-2020 was adopted (Рябинская, 2013). "

At present, in the context of globalization of the economy, the dependence of national economies on the world market and the factors determining its development is significantly increasing. In recent decades, the most important trend has been the rapid expansion of world demand and, accordingly, the international trade in information and communication technology (ICT) products. Analysis of the features of the formation of demand in the world market of information technologies makes it possible, based on the specifics of the requirements for specific characteristics of this product, to identify three main groups of consumers that form the world demand for information technology:

- private and public enterprises engaged in industrial production and the provision of services. Being the main consumer of information technologies, it determines the key directions for the further development of this market and forms demand for application software for solving tasks related to the supply of goods and services, infrastructure software for managing machine tools and personal computers, for the full range of computer and information services. In the context of increasing competition in virtually all sectors of the world economy, companies striving to improve management efficiency, provide a stable demand for various integrated management systems (Enterprise Resource Planning Systems (ERP Systems, Customer

Relationship Management Systems - CRM Systems, Product Service Management Systems - PSM Systems) , whose sales revenue in the world grows annually (Симонова, 2014: 29);

- research organizations and universities. They form the basic demand for applied software for solving research tasks, automating the activities of financial and administrative units, scientific libraries, infrastructure software for personal computers and for the services of computer centers for processing large amounts of information;

- households. They demand first of all the infrastructure software for personal computers, for processing text, audio, video and graphic information.

Overall, the ICT market has become one of the most dynamic and capacious sectors of the world economy, which has led to increased international competition in this field and has led many countries to increase R & D spending, innovation and product promotion to provide leadership in the global ICT industry. Building on a continuous flow of innovation, ICT has now grown into the largest segment of the world economy: its products account for 6.0% of world GDP (€ 3.2 trillion), employment - 6-8% of the total active population, investments - 14- 20% of the cost of production, the profitability of production varies in individual segments from 16 to 45% (3). The industry is responsible for its growth by two main driving factors ( Соловьева, 2014):

- expansion of the general penetration of IT technologies into the business processes of organizations, public administration mechanisms and people's daily lives;

- tendencies to transfer to some specialized organizations some of the internal functions related to the use of IT infrastructure (the so-called "IT outsourcing").

World IT expenses of enterprises, according to Gartner forecasts, reached $ 3.771 trillion. in 2014, which is 3.2% more than in 2013 - $ 3.654 trillion. The maximum growth in IT spending until 2016 will be demonstrated by financial, communication companies, media and services companies, and manufacturing enterprises (Table 3. 1).

**Table 3.1. World IT costs 2016-2017. (billions of dollars)**

| Name | Express in 2016, mln. Dollars | Dynamics in 2016 (%) | Expenses in 2017, mln. | Dynamics in 2017, in (%) by 2016 Dollars |
|---|---|---|---|---|
| Computer devices | 660 | -1.4 | 689 | 4.4 |
| Data centers | 140 | -0.2 | 143 | 2.3 |
| Corporate software | 299 | 4.9 | 320 | 6.9 |
| IT services | 922 | 1.8 | 964 | 4.6 |
| Telecom services | 1.633 | -0.5 | 1.655 | 1.3 |
| IT costs, total | 3.654 | 0.4 | 3.771 | 3.2 |

**Source:**http://studbooks.net/1729611/ekonomika/spisok_ispolzovannyh_istochnikov

In the area of network equipment for enterprises, the main drivers of the market will be cloud and mobile solutions. Demand for Ethernet switches for data centers will be virtualization and also cloud solutions, and the spread of mobile access points continues to stimulate the impressive demand for wireless LAN equipment.

The largest growth (6.9% compared to 2013) will show the market of corporate software (software). There will be demanded such types of software as CRM, DBMS (DBMS), tools for data integration and data quality tools. DBMS costs will even exceed operating system costs, according to Gartner analysts, in 2014 this (DBMS) will be the largest cost segment of the enterprise software market (Суздальцев, 2013: 161).

In IT services, the costs of customers switch from consulting (project planning) to their implementation (doing projects), and Gartner analysts expect a steady increase in costs in this area.

According to Gartner, in 2015, global spending on the purchase of corporate software will reach $ 310 billion, down by 1.2% compared to 2014. Analysts believe that many software vendors will refrain from raising prices for their products to keep customers, albeit at the expense of revenues. In the IT services market in 2015, a decrease of 4.3% is forecasted, to $ 914 billion (Шевко, 2017: 322) .

In developed countries, the situation is improving noticeably. For example, in Western Europe, a 2% increase in IT costs is projected. Analysts attribute this growth to the stabilization of the economy. In Europe, for the first time in several years, sales of servers and storage systems should grow, which in turn will "heat up" the demand for IT services, which may increase by more than 2%. A similar situation today is emerging in Canada. IT spending in the country has increased since the beginning of the year by 5%.

Changed in 2014 and the situation in the IT sector in China. If earlier China was the driver of the global IT market, then this year he did not get this role. In 2014, China is expected to slow growth to below 7%. However, if the situation changes for the better, then IT spending in the country can grow by 10%.

Analysts note that today another weak point of the IT market has been a significant slowdown in the growth of sales of mobile devices: smartphones and tablets. On the one hand, this is due to a decrease in prices, as well as a strong saturation of the market.

Traditionally, the mobile segment has made a significant contribution to the growth of the IT market. Excluding this sector, IT spending in 2014 will grow by 2.9-3.1%. These figures include, to a

greater extent, the costs of corporate products: IT services and infrastructure solutions. Analysts IDC note that companies have accumulated demand associated with the need to update: servers, storage systems and network equipment.

Access to ICT in developed countries is growing much faster than in developing countries, which further increases the digital divide between rich and poor countries.

Regional trends in the development of the information and communication technologies sector are the constant reduction of prices for all types of products and services (associated with strong competitive pressure in international markets) and the rapid growth of modern technologies (for example, the development of broadband access technologies). The dynamics of changes in the share of various regions of the world in the ICT market testifies to the increase in the positions of other countries.

The world's largest entities in the export of goods and services on the basis of ICT are China and India. The rapid growth of the ICT sector has played a decisive role in the growth of the economies of both countries. In 2004, China ousted the United States from the place of the largest producer and exporter of goods based on ICT. In turn, India is the world's largest exporter of ICT-based services (particularly software), as well as the main provider of business process outsourcing services. The total volume of the world market of IT outsourcing is more than 60 billion dollars, of which the export of software is not less than 50%. In the list of exporters, India leads India with revenues of $ 10 billion a year, followed by Ireland with revenues of $ 4 billion per year, the third - China with revenues of $ 3 billion per year. Country with revenue of $ 1 billion - in fourth place, which is quite comparable to the volume of

software exports from the three leading countries, given the growth rate of the Countryn IT market (Шишулин, 2015).

In recent years many countries and international organizations have singled out the implementation of concepts and programs for the transition to an information society as a priority. Such concepts are developed and implemented in the United States, Great Britain, Canada, Finland, France, Japan, Italy, India, etc. These documents take a diverse form, but pursue one goal - to become one of the leaders of the global information community. Analysis of these concepts makes it possible to reveal systemic features of the information society. When creating the concepts of the information society, as a rule, an integrated approach is used, based on the formation of a balance of interests of the state, society, business sector and the individual.

The main trends of the industry development include the gradual decrease in the share of equipment cost in the total IT market, outstripping the growth of services in relation to the software segment, and the transfer of business from the local markets of OECD countries (the Organization for Economic Cooperation and Development) to offshore in countries with low labor costs). The decrease in the share of equipment reflects a decrease in consumer demand for equipment with improved technical characteristics, since its additional advantages are insignificant from the point of view of the majority of customers. The increase in the share of services is also due to the increasing complexity of IT systems, which requires great efforts and costs for their installation, development and maintenance, as well as unique technical skills of the staff. The tendency to attract outside organizations to perform functions related to IT technologies also contributes to the faster growth of the service segment.

Moving operations to offshore occurs in many industries. Features of the IT technology branch allow you to transfer to other countries not only the development of software, but also product support, as well as a number of auxiliary processes. A large number of international IT companies, starting in the second half of the 1990s, opened its branches in India and China and transferred some functions or whole business processes to these units. In parallel, IT companies in developing countries provide services to customers in developed countries through remote access. Indisputable leader in all segments of the offshore so far is India with a rapidly growing volume of IT exports. Recently, the countries of Eastern Europe, oriented to the EU market, and also China, which mainly focuses on the neighboring countries (Japan, South Korea, Hong Kong, the Philippines) have entered the market.

The development of telecommunications and a multiple reduction in the cost of data transmission has become a critical factor in the growth of the market for exported services. Having a good telecommunications infrastructure at competitive prices is an indispensable factor for a country to be able to claim leadership positions in this market.

Thus, the branch of IT-technologies is transformed towards orientation to IT-services, while a significant part of these services will be provided from developing countries. Unlike manufacturing industries, where the international division of labor has already taken shape, the geographical distribution of the IT technology sector has not yet been completed.

According to the forecast of Gartner, world spending on information technology will overcome the bar in $ 3.7 trillion. in 2014 -

mainly, due to increased costs for processing large data and cloud technologies (Яковлев, 2001: 32).

Large data gradually create a new branch of the economy - the "data economy", which is devoted to extracting profit from information. Soon this will provoke a strong growth of the world economy and create many new jobs. Gartner predicts that by 2015 there will be 4.4 million jobs in the world, related to the processing of large data, of which 1.9 million - in the US. Each vacancy associated with the processing of large data will create three more vacancies outside the IT sector, increasing the total number of new jobs in the US alone to almost 6 million over the next four years. The problem is that, probably, there will not be enough qualified personnel to fill all these vacancies. Experts believe that only one third of them will be occupied. In order not to suffer from a shortage of skilled workers, companies already now have to take care of the professional development of existing employees and attract new promising personnel.

Thus, at present information and communication technologies become an integral part of the infrastructure of the world economy, not only ensuring the most efficient functioning of international markets, but also acting as a locomotive in the development of the world economy. It is no coincidence that the developed countries have identified this area as a priority vector of economic development, the consequence of which is the formation of a global information society based on the production and consumption of various information resources.

## 2.1.3 Analysis of the structure and dynamics of the sector of ICT

At the present stage, the model of economic development and the quality of economic growth are determined, first of all, by the priorities

of states in the field of science intensive industries and high technologies, the development of which, according to the concept of Glazyev S. Yu., Was a change in the technological structures that occurred at the turn of the 20th and 21st centuries. Simultaneously with the rapid development of the fifth technological order, based on the development of information services, computer technology and telecommunications, scientists believe that the sixth technological order is emerging, based on innovations in the field of biotechnology, artificial intelligence and space technology.

In these conditions, the development of the information and communication technologies (ICT) sector should be viewed from two perspectives. On the one hand - as a factor in the development of the country's economy as a whole, on the other hand - as a process directly dependent on the economic policy of the state. This approach is conditioned by the scale of the introduction of ICT into the business processes of organizations, the mechanisms of public administration and people's daily lives, as well as the fact that ICTs are today "an extremely broad phenomenon, irreducible to classical technology as a combination of means, processes, operations, methods " (Concept of Development of Tools for Providing State and Municipal Services in Electronic Form, 2015).

In Country, the definition of the role of ICT in the economy on the basis of sectoral division was the result of the historical process of development of the social division of labor. With this approach, activities related to the use and creation of ICT, in accordance with the classifier of the branches of the national economy, were included in the sphere of material production.

In this article, the authors adhere to the campaign adopted in the studies of the Higher School of Economics. The approach is based on the

concept of "the sector of information and communication technologies", defined as a set of organizations engaged in economic activities related to the production, dissemination and use of information and communication technologies. Inclusion of the organization in the ICT sector is based on the criterion of compliance with a certain type of economic activity in accordance with the All-Countryn Classifier (OKVED). The use of this approach in analyzing the level of ICT development and the scale of their application in Country is most acceptable, since unified methods of collecting and accumulating statistical data and formulating the boundaries of the ICT sector make it possible to avoid mistakes in the preparation of an information base for analysis.

The development of the ICT sector facilitated the mass emergence of information products and services, which, in turn, led to the formation of an information market. The following sectors are part of the Countryn information market: the market for information and communication technologies (ICT); market of information products and services; market of software products; market of telecommunications and communication facilities; informatization market. This structure of the information market fully corresponds to the types of activities included in the ICT sector in accordance with the OKVED. In the process of regulating public reproduction, the domestic market of the ICT sector performs several functions: informational - dissemination of information about market participants, demand, supply, etc .; intermediary - providing an opportunity for interaction between market participants; stimulation of effective management and rational use of resources; establishing the correspondence between production and consumption of the relevant types of goods and services; sanitation - ensuring the purification of the market from uncompetitive participants

through competition(Federal Act No. 139-FZ “On the Amendments to the Federal Act ‘On Protection of Children from Information Causing Harm to Their Health and Development’ and Some Regulations of the Russian Federation” (2012),.

Features of the national information market are: lack of stability; heterogeneity of development in the context of the regions of the country; weak development of the private consumption of ICT goods and services; the refusal of the state to operate in the information market as a producer; low information and legal culture of society as a whole, etc.

At present, the analysis of the development of the ICT sector is made on the following indicators: the number of organizations in the sector; gross added value created in the ICT sector; turnover of organizations; production of goods related to ICT; the volume of investments in fixed assets and intangible assets; volume of foreign investments; specific weight of profitable / unprofitable organizations; number and qualification structure of employees; cost and structures of fixed assets and current assets; number of organizations engaged in research and development; research and development costs; the volume of export / import of goods and services related to ICT.

## 2.1.4. Use of ICT in companies

At present, the role of information and communication technologies (ICT) for the activities of enterprises and economies of countries is emphasized in an increasing number of both Russian and foreign studies.

At the enterprises, as a result of the introduction of ICT and the information management systems (ISU) based on them, experts say, there is an improvement in almost all aspects of activity, among them (

Federal Act No. 210-FZ “On Arrangement of Providing State and Municipal Services” (2010)):

• reduction of transport and procurement costs - on average by 60%;

• reduction of the production cycle - by 50%;

• Reduction of delays in shipment of finished products - by 45%;

• reduction of the level of irreducible balances in warehouses - by 40%;

• Decrease in production marriage - by 35%;

• Reduction of administrative management costs by 30%;

• Reduction of the production cycle for basic products - by 30%;

• reduction of storage space - by 25%;

• an increase in the turnover of funds in settlements - by 30%;

• an increase in the turnover of inventories - by 65%;

• an increase in the number of deliveries "just in time" - by 80%.

In recent years, the number of organizations using these technologies in their activities has increased. So, for the period of 2005-2010. the share of organizations using personal computers in the total number of organizations increased by 2.7 percentage points, amounting to 94%.

In the oblast, the growth rate was  points and reached the value of 96%. Also, the share of enterprises using local computer networks, global information networks of the Internet, computers has increased. In addition to machinery and equipment, special software is widely used, which are used to solve the organizational, managerial and economic tasks of enterprises.

The analysis of foreign and domestic experience in the development and implementation of ISU in enterprises allowed to formulate the key organizational requirements for the design and

implementation of such systems, which allow for successful computerization, as well as to determine and measure the effectiveness of ISU use.

In total, we have identified seven such requirements(OECD Communications Outlook 2013, (2013)).

1. The existence of the strategy of enterprise informatization. The presence of informatization strategy allows to determine the perspective and strategic goals of the company in the field of informatization of its activities. The strategy, which is a document that describes the measures and actions to achieve the organization's long-term goals, should not be limited to two projects on the development and implementation of ICT. It should be the disclosure and analysis of the main directions of the enterprise development, improvement of its activity with the help of modern information and communication technologies, include the enumeration of ICT projects, goals, sequence and timing of their implementation, necessary resources, risks and other parameters.

The strategy of informatization involves the development in accordance with the mission and objectives of the enterprise specified in the organization's main strategy.

If this document on informatization is formally developed, then there is a risk that the implemented ICT projects will not in any way correspond to the long-term goals of the company's development, but will be initiated in accordance with the interests of individual managers or groups of employees of the organization.

The availability of the strategy of informatization implies a constant analysis of it, an adjustment taking into account the changing conditions of management, the internal and external environment of the enterprise.

It is necessary to indicate the connection of the informatization strategy with the operational level of management, that is, take into account the prospects for the development of individual structural divisions in the field of ICT.

2. Detailed and qualitative planning of ICT projects.

The development of a specific ICT project, in particular the project on the implementation of the ISU, should begin with the planning and definition of its objectives in accordance with the company's informatization strategy. The project baseline includes the disclosure of the reasons that led to the need for its launch, an indication of the objectives and tasks for which the project was directed and decided, a list of specific activities to be addressed during its implementation, the timing of the implementation of the ICT project, and sources of the necessary human and financial resources.

The plan should take into account those units and activities that will affect the implementation of the IT project. The plan can be dynamically detailed, gradually incorporating a maximally specific description of the tasks and jobs to be performed, the responsible executors and their responsibilities, the timing of the commencement and completion of the work. Also, changes in the plan should be avoided during the project implementation phase, as this may lead to a change in the completion dates and objectives of the implementation.

Planning makes it possible to minimize the risks of cost overruns and delays in project implementation terms, as well as to improve the quality of project management.

The economic benefits of implementing the ISU can only be realized if they are identified in the design process and laid down (directly or indirectly) in the project's target settings.

3. Detailed examination of the impact site of the ICT project. An important requirement is to survey the enterprise, those areas of activity and structural units, which will affect the ICT project.

For the project to develop and implement the ISU - this is almost all the structural units of the organization and processes. The survey should include analysis of information flows, reference, regulatory, regulatory and administrative documentation, description and analysis of affected processes and activities. It is desirable to create an information and functional model for the activities of units or the whole company, to describe, standardize, carry out pre-project optimization of the company's processes and structures, and consider ways to improve control and reporting systems.

Obligatory in the survey is the consideration and choice of ways to integrate existing hardware and software platforms with new ones in order to avoid any bad or conflict situations in the future.

The correct implementation of the survey will help to identify problems that may arise when implementing the ISU and develop measures to overcome them. The result of the survey is the technical task for designing an information management system (Resolution of the Government of the Russian Federation No. 890 “On Measures on Improvement of Electronic Turnover in State Authorities.” (2012)).

4. Selection of the design solution, taking into account its effectiveness.

This implies the calculation of economic and other types of efficiency and the rationale on their basis of specific decisions on the ICT project. Often, the definition and calculation of efficiency is given insufficient attention, although responsible and qualitative implementation of them ensures the choice of the most economically

viable solution. Such a calculation will lead to a conclusion about the feasibility of implementing the entire project.

It is desirable to determine the effect of project implementation in quantitative form.

The choice of specific modules of the system and subsystems should be carried out on the basis of the condition of their maximum compliance with the company's requirements, and not from the conditions of their acquisition from one supplier (in this case, the issues of integration of subsystems become important). In order to avoid problems with the implementation, you should find out in advance the compatibility issues of the new and used software and hardware.

5. Training of employees.

The implementation of the ICT project must necessarily be accompanied by the training of employees in two directions(Sadovnikova at all, 2014: 8):

• training of the specialists of the implementation and support team;

• training end users to work with the new system.

In the course of training, it is necessary to first address the goals and objectives of the project, as well as the positive results that will follow after its implementation in order to convince students of the need for ongoing changes. Training of specialists implementing the project will create a basis for effective and high-quality implementation of the work on the implementation of the ICT project. When implementing the ISU, training in the use of the system will make it possible to pass on to new technologies without pain and to reduce downtime associated with the development of the system to a minimum.

Well thought-out training and informing staff on the ICT project will reduce the impact of the resistance to innovation within the organization.

6. Thoughtful implementation of the project solution.

Before implementing the ICT project, it should be noted that if the need to change the organization's processes was previously determined, this should be done before the immediate implementation of the project. If you neglect to make the necessary changes, then there may be a situation where any benefit from the project will be absent due to imperfection of the affected processes.

It is advisable to start the implementation phase with test launches in separate subdivisions. Testing should be carried out taking into account peak loads (both for communication systems and communications, and for software), possible critical and faulty situations, such as equipment failure, software failures, etc. Testing should be performed by trial operation, the time of which will be checked the qualitative characteristics of the work of the created product: reliability, usability, functional conformity, etc. Direct implementation of the ISU is recommended to be carried out in parts, gradually I commissioned modules, starting with those that are most quickly bring results.

7. Analysis of implementation results.

After the final introduction of the ICT project and the launch of the new system, it is necessary to analyze the achievement and the solution of the project goals and tasks that were put before it at the planning stage with the help of the system developed at the early stages of the system. The best solutions will be systematic monitoring of the evaluation indicators of the ISU and an analysis of its compliance with changes in the internal and external environment. The results of such

monitoring can be decisions about the completion, improvement of the system (Single Portal of State and Municipal Services. (2015), Available from: http://www.gosuslugi.ru, 2015).

Based on the above requirements, the author proposes the following general algorithm, which describes the main stages of the implementation of the ISU project in the enterprise, each of which includes a number of blocks.

I stage - pre-project. At this stage, the mission, strategic goals and tasks of the implementation of the ISU implementation project are determined.

The informatization strategy determines the goals, objectives and activities of the company in the field of information and communication technologies; contains a list of main directions and corresponding stages of informatization, terms, conditions and other necessary information on their implementation. This document describes the main provisions for the formation of the ISU.

The second stage is a project-analytical, on which practical questions of project implementation are developed. The block relating to the design of the ISU by the enterprise is intended for the disclosure of the objectives and the main tasks of the formation of the ISU, the separation and general description of the areas of activity of the enterprise affected by the ISU. The ISU project also specifies the stages, terms of its implementation, necessary resources and persons responsible for the project implementation.

The existing ISU project allows the formation of a group of personnel to implement the ISU. This group can include the company's top managers, department heads (who will later be responsible for the progress of the ISU project development within their subdivisions), ICT specialists, external experts and consultants, system developers

(Statistical Data of International Telecommunications Union. Available from: http://www.itu.int/en/ITU-D/Statistics/Pages/stat/ default.aspx, 2015).

It is important to create a system of indicators for assessing the achievement of the objectives of the ISU, which will determine the extent to which the project aims to implement the ISU.

At this stage, it is also necessary to analyze the business processes of enterprise management, drawing up structural diagrams, defining inputs, outputs, relationships and indicators, internal work and information flows, and documents.

Requirements for functionality for dedicated business management processes are coordinated within the framework of the ISU formation group, then fixed in the technical tasks for separate modules or ISU subsystems.

Based on the terms of reference, a list of possible ISU software options is compiled, both commercial and subject to creation by own efforts of the enterprise or by third-party developers. A list of software technologies is being developed that can be used in ISU modules.

Based on the selected functionality of the ISU, the sources of the effect from the introduction of ICT are highlighted, then the expected economic and other benefits from the formation of the information system are identified. Further, the calculation of the efficiency of investments in the ISU for the expected period of its operation is made.

Also, courses should be created and user training provided for selected ISU software, which will avoid the aversion of personnel innovations and reduce downtime associated with the transition of users to a new information management system, to a minimum.

Subsequently, taking into account the measurement of effects from the implemented ISU modules, a more precise calculation of the

economic effect, rationality of investment use is made, an analysis of the achievement of the ISU of the objectives is carried out. If necessary, changes are made to the informatization strategy, the ISU project for further system improvement. Summarizing the above, we note that the implementation of projects on the introduction of ICT and ISU is accompanied by numerous difficulties and problems, and not always only of a technical nature.

The consideration of the proposed recommendations will help to anticipate and form ways to solve the obstacles encountered in the implementation of such projects, to obtain and measure the effects obtained from the management information system, to create a basis for an adequate assessment of the effectiveness of the respective investments.

# 4. METHODOLOGY AND RESULTS OF ICT DEVELOPMENT IN THE COMPANY

## 4.1. Methodology

The company "Tander" CJSC for 2015 has formed more than 10 thousand stores "Magnit", in the formats hypermarket, shop "at home", magnet "cosmetics". Optimization of services with the help of ICT has allowed it to become one of the leading companies engaged in retail trade.

Over the past 5 years, the company has actively implemented information and communication technologies to automate business processes, support existing automation tools, monitoring. Analyzing the equipment of workplaces, it can be noted that 6,500 employees of the main office account for 7,000 PCs, each with Internet access, and document circulation is carried out via e-mail. A wide range of software

products is used in the company: MS SQL Server, Oracle, 1C, MS Excel, megakarta, "Thunder warehouse", MS Access, Teradata.

The implementation of MS SQL Server, which hosts the HYPER server with databases, stored procedures, allowed to automate a significant amount of data by creating SQL queries and then converting them into procedures. For example, tactical audit, PM / PG turnover, STAT (automatically updates the company's staff), the procedure of "margin experiments", auto reports (automatically generated by the procedure reports on the company's quantitative and qualitative indicators in comparison with competitors), a procedure that calculates staff list and salary, for issuing the result, it is required to enter the code of the hypermarket and turnover.

With the help of stored procedures, it is easy and quick to create updated summary tables to provide management reports for management decisions.

The company also uses the OCH map, a map of sales points, to calculate the number of residents of pedestrian accessibility in the Excel file and the rest in the selected area of the city. The principle of work consists in counting the number of apartments, then multiplying by the average number of people living in them (3,2) and outputting the results of the total number that is entered in the database. Among the shortcomings: inaccurate calculations of numbers and not all cities recognize.

Earlier, the employee calculated the potentials (turnover), the target figures by formulas in manual. Formed the letter within 4 hours. After the automation, the employee enters the data of the number of zones, the program considers the indicators itself. The data is taken from the updated pivot tables, and a template of the letter for sending to the directors for approval has also been created. After optimization of this

process, the calculation of 1 potential took 24 minutes. (0.4 hours) - 10 times less, which significantly reduced man-hours.

The tactical audit procedure determines the best and worst hypermarkets in terms of performance. Previously, for analysis, every month it was necessary to download the data, check them for correctness, the report execution time was 3 hours, then wrote a procedure that automatically calculates the correct data. Now, having started the procedure, it is enough to specify the month of profitability and the month of sales. The report will be generated automatically. It took 20 minutes to check and form the letter, the labor costs were reduced by 2 hours 40 minutes.

To compare Magnit's performance with the tape or other large federal competitors, it was necessary to download certain data, analyze it, these actions were spent 4 hours, after writing scripts for SQL letter-comparison (Magnet vs Ribbon, Magnet vs Okay, Magnet vs x- 5 Retail) is generated automatically, it takes 1 hour to check it for correctness.

Using the SQL language, a procedure was written for analyzing the flow and performance of frames, it was the basis for a summary table with flow and productivity schedules. This summary automatically updates and graphs based on a series of consolidated data, it only remains to change the data source for the graphs with the beginning of the new month.

**Table 4.1 - Comparison of automation procedures**

| **Procedure** | **Before automation** | **After automation** | **Reduction of working time,%** |
|---|---|---|---|
| Calculation of potentials | 4 h | 0.4h | 90% |

| | | | |
|---|---|---|---|
| Extraction experiments reports | 40 h | 2 h | 95% |
| Tactical audit | 3h | 0.3h | 90% |
| Comparison procedure | 4 h | 1h | 75% |

CJSC "Tander" announced the transition to electronic document management (EDI) with all suppliers, it is explained by its efficiency, as the terms for processing, providing documents are reduced, costs for mail and transportation are reduced, costs are mutually reduced. The goal of the transition is to standardize the processes of transfer of documents, digital data on a specific schedule. The advantages of this system are the absence of errors in order processing, good data quality, there is no risk of losing orders due to technical failures, the document exchange process becomes transparent and simple.

In Russia at the moment, the penetration of electronic document management was less than 0.1%, in European countries it is about 20%. The development of these tools is hampered by factors such as the widespread belief in the reliability of a paper-certified document; the need to train employees; drawing up and closing of documents in the completed period; the FNS is not ready to accept all electronic invoices, since there are a huge number of them; the unwillingness of suppliers and other contractors to switch to EDI [62].

Among the developments in the field of ICT, it is possible to distinguish the SIS monitor, which in the future will determine the optimal place for the construction of a hypermarket (GM) in the city, by entering parameters, for example, the format based on the planned retail space, seasonality, region and city.

Another development is a monitor for calculating the potentials, revolutions of the GM, which would use the GM code as input, output the coverage area, traffic check, and specify the reasons for the recalculation.

At the first stage of the project, the analysis was carried out, the investments and the period of their payback were calculated. The cost of the machine on average is 1.3 million rubles. Then, before the implementation, work was done to integrate the self-service cash register software with the program of the Magnit store and the consulting part, that is, all business processes.

## 4.2. Results

In Krasnodar and in Tuapse, there is testing of self-service outlets, it attracted attention to technology. In plans before the end of 2015 the installation of cash desks in 40 hypermarkets.

Recommendations and proposals for improving the optimization of the activities of CJSC "Tander".

1) Use of radio tags on goods. In our opinion, despite the automation of the purchase process through self-service cash registers, it is much more efficient to use radio tags on goods instead of barcodes, so the number of actions when buying is reduced. The principle of the device consists in scanning with the use of RFID technology of goods with labels in a special box, into which the buyer places his goods, then displays information about purchases on the screen, and selects the form of payment through the terminal. This promising project, created by Rusnano, Sitronics and X5 Retail Group, was presented at the Rusnanotech-2011 forum. Automatic cash register with RFID technology recognizes goods at a distance of up to 30 meters and has a memory of 8 kilobytes. The cost of implementing this system 5 rubles. on the goods, but with a large spread, it will decrease. Advantages of implementation are protection against expired and counterfeit products, reduction of queues at cash desks, recording of all information about the goods from the supplier to the buyer. However, this system has drawbacks, for example, it is impossible to glue tags on goods containing

metal or goods in metal packaging, another disadvantage is the inaccuracies in reading more than 200 items in the box.

2) Develop a monitor for calculating sales plans. The development of a monitor for calculating the potentials, revolutions of the GM, which would use the GM code as the input data, would output the coverage zone, traffic check, and specify the reasons for the recalculation automatically.

In our opinion, when creating a monitor, it is necessary to break a mega map into a grid, then write a procedure for automatically generating a letter that would only have to check the correctness of the parameters. The procedure automatically tightens the number of coverage areas for each GM throughout Russia. Now all calculations are made in Excel, the average cost in Russia for obtaining such statistics is 12-15 million rubles. When implementing the monitor, it will be necessary for 3 employees to 5 hours a day for 5-6 months to analyze all the cities, that is, the costs will be equal to their wages of approximately 35 thousand rubles. per month - 630 thousand for half a year.

The introduction of business process automation systems significantly saves time, resources, and the activities of a modern company engaged in trade, is economically more profitable through the use of ICT.

The use of ICT in the company CJSC "Tander" has a direct impact on the company's economic growth, increases labor productivity, minimizes costs, leads to an increase in profits, so revenue as of March 31, 2015 amounted to 763,527, 25 million rubles.

The development of ICT is a defining element in the speed of economic growth. The main direction of the impact of information and communication technologies on society is the impact on the structure of the national economy, state policy, culture, science and education. As a

result, a new communication economy is being formed, in which knowledge and information become the main resource for development.

The nature of the ICT product itself made it possible to penetrate all spheres of human activity and make them more accessible (various social services, health care and education). Modern information technologies not only ensured their accessibility and increased it, but also made the process of interaction between people easier and faster, and also increased labor productivity. This, in turn, creates an additional socio-economic effect.

ICT has become the main condition for economic development, sustainable development in modern society, because thanks to information and communication technologies it is ensured:

- continuous development of human potential;
- development of scientific and technical potential;
- establishment of strong ties between scientific and technical institutions and the business sector;
- functioning of accessible transport networks and communications between regions, countries;
- dissemination of accessible modern technologies among the population.

Information and communication technologies contribute to the development of the country's economy in the long term: countries with a more developed ICT industry are becoming more competitive.

Indirect effects from the introduction of ICT are the growth of labor productivity, the inflow of foreign direct investment into the country, this leads to the formation of science cities, centers of scientific and innovative clusters, and as a result, then the export of information and communication technologies and services is increasing.

Information and telecommunication technologies, acting as a factor of integration development, allow obtaining the following results:

1) Investments in ICT as a means of production lead to a "deepening" of capital, and hence to an increase in labor productivity. Companies produce the same volume of products with lower costs. Reduction of costs is achieved by improving the production process.

2) The increasing use of ICT allows firms to increase efficiency, and hence multifactor productivity (MFP). Technical progress, especially in the area of ICT, dramatically increases labor and capital productivity and creates a special environment in the enterprise that stimulates productivity growth. It is clear that the increase in labor and capital leads to an increase in productivity, but today we can talk about the presence of some additional component of growth, which arises not simply as a result of simple accumulation of the main factors of production, but because of their joint use. This component is called the cumulative productivity of factors of production, or multifactor productivity.

The strategic importance of ICT lies in the fact that they change the way companies function, affecting the very process by which companies produce the product.

3) In the sphere of integration and policy strategy, information needs of integration structures are provided, agencies and agencies are identified, and free information exchange is being expanded.

4) Complex management operations involving many state institutions, enterprises and citizens are greatly facilitated.

When creating a unified system of mutual information exchange, they can be fully implemented in electronic form .

5) The labor costs for organizing integration ties and business contacts are reduced, time is released as one of the main resources. Information and telecommunication technologies are an instrument for

reducing transaction costs (by 25-75%), reducing the time of operations and increasing the speed of response of companies and public authorities to the requests of suppliers and consumers. This includes the following articles:

- search for information about the product, the customer, etc .;
- negotiation and conclusion of a contract, reduction of the cost of acquired resources in the implementation of electronic procurement;
- monitoring of contract discipline;
- insurance against unfair (opportunistic) behavior of partners;
- evaluation of the quality of goods, services;
- resolution of claims, protection from third parties;
- development and support of legal norms and standards.

4) In the field of technology, transition to new applications, new data structures and new standards is provided.

The experience of highly developed countries shows that the development of the ICT sector occurs together with the erosion and reduction of employment in the industrial and agricultural sectors, as well as a decrease in the competitiveness of the industrial sector. By the end of the 20th century, employment in activities related to the acquisition and processing of information in the United States was about 47.4%, in Great Britain 45.8%, in France 45.1%, in the FRG 40.0%. Simultaneously, industrial production has become more effective in developing countries with a large volume of resources and relatively cheap labor.

The increase in labor productivity allows companies to raise their employees' salaries without increasing prices and thereby creating a real, non-inflationary increase in incomes (and vice versa, an increase in wages financed solely by price increases does not give a general increase in consumer purchasing power and real economic growth). Thus, the

surest way to sustainable growth of the economy is to invest in assets that increase its effectiveness.

Labor productivity, according to the leading Cyril Korniliev (IBM Russia and CIS) at IT-Summit 2014, in Russia, in the electricity sector, 15%, in housing construction 21%, in retail 31%. At the same time he noted that: "In industries that intensively use information technology, labor productivity grows 1.7 times faster than the average in the economy."

## 4.2.1. Application of ICT in the work of CJSC “TANDER”

According to the forecasts of the long-term socio-economic development of the Ministry of Economic Development, developed by presidential decree and approved by the government in May 2013, the IT market, developing on the conservative (option 1) or innovative (option 2) scenario of economic development, can grow 2.7 times in 2030 in relation to the year of 2011. and will amount to 4102.6 billion rubles. - 1 variant, and 5640.4 billion rubles. - 2 variant growth in 3,7 times (Table 3). The main trend is an increase in the share of software and IT services segments, and a decrease in the share of the equipment segment, and in the conservative version the share of software and IT services is less than in the innovative version.

**Table 4.2 - Forecast of the IT market development until 2030.**

| Segment | Turnover by years, billion rubles | Change | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2011 report | 2020 | 2030 | 2020. by 2011,% | 2030 by 2011, % | | | | | |
| 1 var | 2 var | 1 var | 2 var | 1 var | 2 var | 1 var | 2 var | | |
| The volume of the IT market, including: | 648.6 | 1748.4 | 2,082.9 | 4102.6 | 5640.4 | 164.1 | 195,3 | 269.6 | 374.8 |
| Hardware (Hardware) | 332.5 | 770 | 862.3 | 1440.9 | 1753.1 | 134.4 | 150.5 | 175.8 | 213.9 |
| Software | 132.1 | 462.1 | 582.5 | 1375 | 2073.3 | 223.6 | 281.3 | 467 | 719.9 |
| IT services | 184.1 | 516.3 | 638.1 | 1286.6 | 1814 | 178.7 | 221.1 | 312.5 | 451.9 |

Thanks to the steps taken by the state and business, the results of the development of the information and communication technologies industry, such as occupying an increasingly high position in international ratings, appear. So on April 15, 2015. The World Economic Forum (WEF) published the "Global Report on the Development of Information Technologies 2015", it contains data on the development of ICT in 143 countries. In the rating of the network readiness report Russia climbed 9 positions compared to 2014 and took 41 places, in 2013 - 54 places, in 2012 - 56 places, in 2011 - 80 place, and among the BRICS countries Russia is the leader: China occupies 62nd place, Brazil - 84, India - 89. (Appendix D).

According to the report, the gap in the index between the leading countries and the laggards is widening. Starting from 2012. Developed countries doubled their rates faster than developing countries.

The Russian Federation noted improvements in all areas, from the use of ICT business to the introduction of ICT in public administration. The advantages of Russia include the low cost of access to ICT infrastructure, its development, adult literacy and the high degree of influence of ICT. It hinders to rise above the unfavorable business climate and attitude to innovation compared to other countries and the degree of ICT use by business, there is also no improvement in indicators of the development of legislation in the field of ICT 80 points, intellectual property protection 106 point in the rating and use of unlicensed software 57 point.

The data shown in the report show an increase in the digital divide between countries at an accelerating pace of technological development, so that Russia should not be left behind to immediately take measures to the government, creating a favorable regulatory framework and business environment with competitive ICT markets.

In the Russian Federation, the level of development of the interactive form of communication is still lower than in the economically developed states. According to the rating (Appendix A, B) of the United Nations e-Government Readiness Index, the Russian Federation is ranked 27th in 2012, in 2014 the position has not changed - 27th place (out of 193), in 2010. occupied 59 place. One of the reasons for the invariability of the positions in the rating is the inadequacy of the development of e-government services, since the top stage of development of services was estimated by the authors of the rating of 35 points out of 100, although they were estimated at 91 points for informing citizens of the state services in electronic form (Appendix B).

This rating is published every two years by the United Nations Department of Economic and Social Affairs, the next version will be released in 2016. The index includes three sub-indices describing the state of human capital, ICT infrastructure and the web presence of public authorities.

In order to maintain the results and hold high positions in the future in international ratings assessing the development of ICT, network preparedness, the development of the information society, e-government, knowledge economy, it is necessary to maintain and improve the ICT access infrastructure. The ratings in the world rankings have a positive impact, it gives an opportunity to develop their own criteria and assessment methods, taking into account the national specifics, and has economic and political significance.

Thus, the results of international assessments indicate the progress of the Russian Federation in the development of the information society and, as its main condition for existence, the development of ICT.

Investing in Information Technology: The ICT sector shows a broad and long-term impact on reviving productivity growth in the country. Investments in ICT, which have a high multiplier effect, in 2007 reached a historic high. According to UNCTAD (United Nations Conference on Trade and Development), they, on average, provide a return of $ 2.7-3.5 for $ 1 investment, and in the US, even from $ 5 to $ 10.

Human capital and ICT competence are today an important factor of innovative development based on ICT. At the same time, large-scale use of ICT leads to important social and economic effects, changing the face of modern society, expanding the possibilities of people.

## 4.2.2. Prospects of ICT development in the light of modernization of the economy

The following effects of the positive impact of ICT on economic development should be highlighted:

1) The presence of a modern regulatory framework will make it possible to use ICT more effectively.

2) ICT affects productivity by providing tools to facilitate the processing and transformation of data and coordination of work.

3) Investments in ICT contribute to "deepening of capital": they increase the capital-labor ratio of workers and, accordingly, the efficiency of production and labor productivity. Companies produce the same volume of products with lower costs.

4) ICT transform business processes, making them more efficient and transparent: automating business operations, creating business models. Technical progress, especially in the area of ICT, dramatically increases labor and capital productivity and creates a special environment in the enterprise that stimulates productivity growth.

5) As a rapidly growing industry, ICT itself affects economic growth. Since the ITC sector is one of the most innovative and dynamic sectors of the economy, it stimulates innovative development, the penetration of information technology and services into remote areas of the country.

6) ICT creates new jobs and thereby increases the total volume of production. There is an increase in the total volume of production. One ICT sector employee creates products and services worth about 2 million rubles. a year, according to the Minister of Communications and Mass Communications of the Russian Federation N. Nikiforov, and the entire industry from year to year increases the export of Russian IT products abroad. In 2013, exports exceeded $ 5 billion.

7) ICT requires a large number of educated and trained people, and therefore their spread leads to investment in education, the emergence of new tools for professional development and the creation of social networks.

In the IT field, the selection of personnel is hampered by the abundance of narrow professional requirements. To solve this problem, the opening of branch departments, with the financial support of large and medium-sized businesses, which is most interested in quality personnel, is being washed. For example, Rostelecom has already opened three departments, five more - in the project according to 2012 data.

Also, to solve this problem, the project for the development of IT education in schools in Moscow starts. It is implemented within the Strategy for the development of the information technology industry until 2020 and for the future until 2025, developed by the Ministry of Communications of Russia and approved by the Government in late 2013.

8) Reducing transaction costs, releasing time as one of the main resources. ICTs are an instrument to reduce transaction costs by 25-75%, reducing the time of operations and increasing the speed of response of companies, public authorities to the requests of suppliers and consumers.

In modern conditions, the ICT sector has a significant economic impact on GDP, it is a significant part of GDP. The widespread use of ICT is brought about by organizational innovations in the production, consumption and interaction between economic entities, and opens up new opportunities for information exchange. Electronic forms of service delivery have appeared: electronic commerce, electronic finance, e-government, etc. However, there are also problems related to issues of trust and information security.

As a result, we can say that the ICT industry contributes to economic development, improves the efficiency of providing state, medical, educational and social services, which in turn makes it possible to improve social stability.

To support the economic development of the Russian Federation, it is necessary to create favorable conditions for the development of ICT by actively supporting the ICT industry from the state, attracting investments from various sources.

# CONCLUSION

Based on the results of the study, the following conclusions were drawn:

1. Investigating the evolution of ICT development, it was found that the formation of the information society is characterized by an increase in information technologies in life, the growth of information society, the growing number of people employed by information technology. It was also revealed that the history of technology for processing, storing and transferring information in its development has passed through several stages: "manual" information technology; "Mechanical" technology; "Analog" technology; "Electronic" technology; "Computer" ("new") technology; "Network technology." According to the common definition, information and communication technologies are a combination of methods, production processes and software and hardware integrated with the purpose of collecting, processing, storing, distributing, displaying and using information for the benefit of its users. The main functions of ICT are cognitive, communication, transformational, integrative functions. The ICT market is a market, information products and services, its internal structure is

conventionally divided into the IT market and the telecommunications market. However, the ideas about the internal structure of the ICT market for analytical agencies and Rosstat are different, that is why the volumes of ICT industry and its components differ.

The ICT market is functioning due to the provision of a system of socio-economic institutions: the legal system, state control and regulation bodies, market infrastructure.

2. After studying the history of ICT development, it is clear that they have provided economic growth in many countries due to the fact that information and communication processes generate and develop processes of generation, exchange, storage of information, create various communications for the interaction of economic entities, as well as distribution and use ICT leads to a change in the level and quality of life of the population.

3. Having studied the social consequences of ITC, the impact on ICT users, on the economy, the shortcomings and advantages of information and communication technologies were revealed. The advantages include:

- access to a large number of information sources;

- the ability to produce and broadcast information, and not just to consume the information product;

- a significant increase in the quality of life, accessibility of goods and services, the transition of cultural, social, economic activity into virtual space;

- Accessibility, continuity and distance education.

Disadvantages are:

- information inequality or uneven distribution of information resources between countries and civilizations;

- Reduction of personal space of a person, loss of anonymity, problems of depersonalization of communication in the virtual world, the problem of computer ethics;

- Virtualization of human communication;

- Unification of cultures;

- international terrorism;

- an increase in the number of computer crimes.

Analyzing the role of modern information technologies in social and economic development (education, healthcare, interactive interaction of government bodies and the public), they came to the conclusion that ICTs expand opportunities for realizing the goals of social and economic development.

4. Analysis of the legal framework revealed that the basis for the development of legislation in the field of ICT application are the legal norms contained in the Constitution of the Russian Federation, the basic law - the Federal Law of the Russian Federation "On Information, Informatization and Information Protection", also in this area the "Information Society ( 2011-2020) ", the project" The Concept of Innovative Development of the Telecommunications and Information Technologies Industry "," The Strategy for the Development of the Information Technology Industry in the Russian Federation for 2014-2020. and for the future until 2025 ".

Thus, the state ensures the development of legislation and improvement of law enforcement practices in the use of ICT.

5. A survey of the current state of the ICT market in Russia has shown that since 2013 the growth of the ICT sector has decreased according to the estimate of the Ministry of Communications in 2014 - 698 billion rubles. The slowdown in the growth of the information and communication technology industry in Russia was influenced by factors

such as a slowdown in the growth rate of the Russian economy in 2013; accession to the World Trade Organization; the completion of large-scale projects, the difficult economic and political situation due to the crisis in Ukraine has led to increased risks, uncertainty; insufficient diversification of the economy; - an increase in inflation and prices for imported equipment, software. However, the steps taken to develop the ITC sector yield results: an increase in the rankings of the Network Readiness Index in 2015 - Russia ranks 41st, 42nd in the Information and Communication Technology Development Index in 2014. A positive trend is also a 48% increase in mobile penetration broadband access (broadband access), fixed access by 11%, and as a result, Russia ranked 11th in the world in terms of the volume of the telecommunications market, which entered the stage of maturity. Thus, the results of international assessments indicate the progress of the Russian Federation in the development of the information society and, as its main condition for existence, the development of ICT.

6. Analyzing the work of CJSC "Tander", it can be seen that it actively implements information and communication technologies for automating business processes, supporting existing automation and monitoring tools. Programs (tactical audit, turnover of PM, PG, STAT) shortened the time to create a report to a minimum, facilitated monitoring and accounting of quantitative and qualitative indicators of the company, maximizing labor productivity. There are promising developments, such as a SIS monitor and a monitor for calculating the potentials, revolutions of the GM, and to optimize the service, a self-service checkout project has been designed and implemented in the hypermarkets of the network.

The use of ICT in the company CJSC "Tander" has a direct impact on the company's economic growth, increases labor productivity,

minimizes costs, leads to an increase in profits, so revenue as of March 31, 2015 amounted to 763,527, 25 million rubles.

The author proposed to introduce radio tags on goods instead of barcodes, that is, "smart cash desks" instead of regular cash registers, as the advantages of implementation are protection from expired and counterfeit products, reducing queues at cash desks, recording all information about the goods from the supplier to the buyer. Another optimization proposal is the use of a grid to break a mega card for a SIS monitor in order to reduce the manual calculations of the coverage area, check check.

7. Investigating the impact of the ICT industry on economic development, the following effects were highlighted: ICT affects productivity by providing tools to facilitate the processing and transformation of data and coordination of work; ICT transform business processes, making them more efficient and transparent; as a rapidly growing industry, ICT itself affects economic growth; ICT creates new jobs and thereby increases the total volume of production; ICT requires a large number of educated and trained people, and therefore their spread leads to investment in education, the emergence of new tools for professional development and the creation of social networks.

Thus, the ICT sector determines the development of technologies and related processes, is an important factor in economic growth, creation of new jobs and the development of innovative technologies that contribute to improving the efficiency of the business sector globally. The ICT sector is distinguished by the dynamism of development, which manifests itself in the emergence of innovative products (services) of a large number of organizations and the growth of basic economic indicators, including labor productivity. The availability of a competitive

ICT sector is important for the national economy, despite the possibility of importing goods and services of this sector for domestic consumption.

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