



## Review and analysis of World Experience in the Use of Information Communication Systems, Technologies in Social Support and Rehabilitation of Families

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**Abstract:** This article describe how to use the information technologies in education, both in everyday life and for distance learning, is becoming increasingly widespread throughout the world. ICTs can significantly increase the chances of people getting an education at all levels. The widespread use of ICTs in knowledge acquisition can also promote family cohesion, promote family values, prevent adverse social conditions in families, and, above all, provide training in work and access to information and communication technologies. ICT provides an opportunity to organize remote work, the performance of professional duties by a freelancer at a distance from the location of the organization where he works (at home or in the center of telecommunications services), through telecommunications and computer equipment. This article reviews and analyzes the world experience in the use of information and communication systems and technologies in the social support and rehabilitation of families, suggests the introduction of special programs for the use of ICT in the field of social protection and support of people from families in need, which are mainly narrowly focused on providing specific functions and tasks for the organization of self-help for family representatives.

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### Introduction

The IT industry is now developing faster than any other sector of the national economy. Therefore, free training in the basics of information and communication technologies is the best option that will give an impetus to the development of your career, become an educated person, or simply find additional income in the Internet (selling your products in online stores: baking, clothing, etc.).

Today, the economic development of any country and its role in the world community depends on such important factors as the quantity and quality of information services, the degree of their availability and use by various groups of the population.

The main source of information until recently was the mass media, while the possibility of obtaining information from the original source was practically absent. Today, the world is witnessing multi-sided trends, transformation of all public institutions and spheres of human activity under the influence of information and communication technologies (ICTs).

International practice has already accumulated sufficient experience (both positive and negative) in

the development and implementation of stages and projects for the introduction of ICT in various sectors of the national economy. In most advanced countries of the world, such as, for example, Canada, Korea, Malaysia, Singapore, and the United States, strategies or integrated programs for information development of both societies as whole and individual spheres of activity have been developed and implemented. Today, there is no single template that can meet all the conditions and solutions to the problem of forming the introduction of ICT and its application in a particular activity.

According to a number of researchers, each country has its own unique combination of circumstances, priorities and available resources that can be used in the implementation of this task. Most of the countries in the world in the process of building e-government focus on electronic access to basic public services<sup>1</sup>. The UN methodology defines a four-

stage model for the development of e-services provision2:

1) Developing e-government, where government websites are presented as simple business cards and official web pages. At this stage, electronic interaction between ministries and departments of the Central government, as well as between Central and local authorities, is possible. Some official information can be provided online;

2) Expanded presence of e-government, in which the state provides more information via the Internet — laws and regulations, reports, news, downloadable databases. The user can use the search engine to get acquainted with the documents available on the site;

3) Transactional presence, involving interactive interaction between a citizen and the government;

4) Network EP-which is the most developed level of government work on the Internet. G2G (state-to-state), G2C (state-to-citizen), C2G (citizen-to-state) services are integrating. The government engages citizens in the preparation and decision-making processes and public discussions.

Analyzing the experience of building e-government in different regions and countries of the world, it is customary to identify three main models that have been put into practice in America, Europe and Asia. Conditionally, they can be called as follows: the American model, which reflects the specifics of its formation in the United States; the European model, within which the development of electronic government structures is carried out in most countries of Western, Central and Eastern Europe. The Asian model, most successfully implemented in Singapore and South Korea.

The continental European model of e-government is characterizing by strict legislation regulating information relations and information flows that circulate in the European information space.

The Anglo-American model of Informatization of the state is based on the principles of service provision of public services to citizens, exclusion of redundant functions of government bodies and rapid satisfaction of citizens' needs through information technology.

#### **Methodology**

The Asian model of e-government is basing on a specific management style, an Asian type of corporate culture, and a multi-layered system of public administration organized according to the principle of a hierarchical pyramid.

An important success factor in the United States was the integration of positions related to the Informatization of public administration and the quality of interactive government services into the overall system of evaluating the effectiveness of government departments, which reflected in the

amount of funding from the state budget and special funds.

The European approach to the development of the e-state is largely based on the basic principles of the macroeconomic policy of the EU countries in the field of information society formation, stated in the "E-Europe" program.

Singapore is one of the leading countries in the implementation of information technologies, including in the most conservative and least susceptible to changes in public institutions such as public administration and government interaction with ordinary citizens. Singapore became the first country in the world where, in 1999, a major government portal e-Citizen Centre created ([www.ecitizen.gov.sg](http://www.ecitizen.gov.sg)), where citizens of Singapore can not only get information about a particular government Department, but also perform a number of actions that previously would have had to go to a specific government Agency.

South Korea's e-government has won worldwide recognition. The reason for Korea's leadership is the significant development and provision of mobile applications downloaded from the country's single integrated portal. The formation of e-government in South Korea began in 2001 with the adoption of measures on the main blocks that make up e-government. Already in 2003 Kazakhstan, having spent \$225 million on these activities, has reached the 4th place in the world in the digital opportunities index, the 12th, according to the world Bank, in terms of the development of the information society, and the 13th place in the UN list in terms of the use of ICT in the provision of public services. \$1.3 billion allocated for the implementation of these projects in 2003-2007. with parallel state funding of Informatization programs and reduction of the "digital lag". The portal provides access to services through numerous channels. With the goal of bringing e-government services closer to advanced ICTs by 2015, the Korean government is currently implementing the Smart government strategy. With its help, citizens will be able to enjoy easy and free access to public services, regardless of access channels. Accordingly, South Korea hopes to solve its social problems of low birth rate and aging society, while actively responding to the future needs of social security and welfare of the population. The government of South Korea, when forming the model of e-democracy, has focused on meeting the needs of the population and implementing ICT in the system of culture and education [1].

The UNESCO international Institute for information technology in education is actively engaged in the use of ICT for learning. Well-known companies such as Microsoft and IBM are actively developing "assistive" technologies. Reviews of

information resources also showed that the development of computer technology for social support and rehabilitation of people from needy families is also being considered by other countries, such as Japan, Finland, and the United Kingdom.

Education and employment for families in need

The use of information technology in education, both in traditional classrooms and for distance learning, is becoming increasingly widespread around the world. ICTs can significantly increase the chances of people getting an education at all levels.

- The widespread use of ICTs in teaching and learning can help solve many problems, including problems related to the availability of educational institutions.

- Under the influence of Informatization, all types of markets are transformed, including the labor market. Apparently, the most "revolutionary" phenomenon in the field of employment has become the so-called remote work, or virtualization of workplaces. Virtualization of workplaces has become a universal means of providing employment for people, especially those who live in rural areas.

- The main feature of remote work or telework is that an employee performs professional duties at a distance from the location of the organization where he works (at home or in the center of telecommunications services), using telecommunications and computer equipment. Virtual "distance economic relations" are establishing between employers and employees.

- A common element of telework in all its manifestations is the use of computers and telecommunications to change the accepted geography of work.

- Telework is made possible by:

- - Reduce the cost and increase the productivity of computers and telecommunications;

- - Availability of certain tools and services that support Open Electronic Networking, including the open Internet;

- - Readiness of employers and employees to explore and use new opportunities to achieve business success and achieve personal goals.

- Telecommuting is becoming attractive for the participants of the labor market direct to:

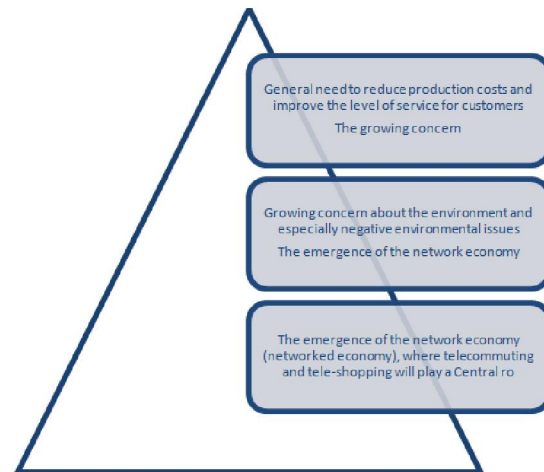
- - The General need to reduce production costs and improve customer service;

- - Growing concern about the environment and especially negative environmental problems;

- - The emergence of the network economy (networked economy), where telecommuting and tele-shopping will play a Central role;

- - Shift from "paid employment" to the "work opportunities", with a simultaneous increase in self-employment (self employment) and part-time

employment (part time employment), as well as strengthening the position of entrepreneurs, very small firms and "micro enterprises", Figure 1.



**Fig. 1 Graphical structure of telework**

Understanding the essence of telework is now an important point in developing business strategies and for people's careers. Today, we see how the employer's requirements for staff mobility, flexibility of organizational structures, and the ability to adapt to constant changes in the external environment are increasing. With the introduction of the concept of remote work, employers have a wide range of new opportunities for the practice of organizing work, which includes flexible working hours, flexible location of the workplace, a flexible contract with the contractor, etc. Centers for collective use of telework are the result of the implementation of these trends. Each employee gets to the office that is most convenient for them: either the closest or the most convenient when using public transport.

The "team" works together through electronic networks. TV centers may be owned by a single company, or a company may have a workplace in a center that is shared by several companies.

When changing jobs, when an employee changes jobs, there is no problem moving, only the elements of the organizational structure change. When an employee leaves a job, or is promoting, or changes their career in another form, the company can replace them with the most suitable candidate, regardless of geographical restrictions.

With the support of the European Commission, a special project Electronic Commerce and Telework Trends (Ectt) organized, which conducted a study of trends in the development of e-Commerce and telework in ten European countries, as well as in the United States and Japan.

Research has found that, on average, remote workers account for more than 25% of total employment. In General, the sectorial structure of employment based on the principles of distance employment is largely determined by the specifics of a particular national labor market. At the same time, the Esatt study finds that two-thirds of respondents are extremely interested in switching to permanent or partial home work.

With this form of work, two of the most important needs of any employee are met– the need for a flexible working schedule and the ability to spend more time in a familiar social environment (family). In addition, they spend less time and money on transport, have the opportunity to participate more actively in public life and, most importantly, spend more time with their family. At the same time, the employer saves costs, has a flexible and mobile staff structure, and increases productivity, because TV workers have less unproductive time spent.

Remote work is firmly included in the reality of modern social and labor relations everywhere. The attitude to such employment should not be based on opposition to traditional employment. Even with the ever-increasing interest in virtual work places from the subjects of social-labor relations as a fact you must accept that the possibility of spread of non-traditional forms of employment are largely determined by local factors, mentality, level of infrastructure development, socio-demographic characteristics of the workforce, level of legal regulation, level of development of the territory, etc. However, remote employment is more likely to meet the needs of not only many workers, but also the modern employer.

Automation of diagnostic methods in psychological and medical rehabilitation

The possibilities of using ICTs in psychological and medical rehabilitation are diverse and include automation of diagnostic and therapeutic methods, conducting new types of rehabilitation.

Given the continuously increasing capabilities of computers, it can be noted that the limitations that existed in the methodological apparatus of diagnostic psychological tests are removed when using computer technology.

The computer is using for storing a large amount of information on diagnostics and data analysis. Most of the known psycho diagnostic tests are automated today.

In addition, in contrast to the "quantitative" effects that the automation of psycho diagnostic diagnostics provides, the development of computer psycho diagnostics is associated with fundamentally different, qualitatively new opportunities that the use of computers has opened up. It is now possible to use

large test volumes and content, as well as time parameters, more efficiently and effectively during testing.

With the advent of interactive computer systems that can work with dynamic graphics, moving and static video images, and high-quality speech and sound, the development of tests in the form of models as close as possible to real activity, which dramatically expand the possibilities of psycho diagnostics. In addition, such systems allow for group presence and interaction in the virtual world.

Today, computer game tests are also used in psycho diagnostics. Using interactive virtual environments with immersion for educational, psychotherapy and rehabilitation purposes, the options Discussed above for using traditional ICTs for rehabilitation of families in need cannot fully provide:

- involvement of all sensory and motor organs in the process of activity;
- direct interaction with the object of activity;
- support for joint activities involving active interaction of each participant with others.

One of the solutions to these problems in rehabilitation is the use of interactive virtual environments with immersion, which support the person's immersion in a certain environment and interaction with objects of this environment, taking into account its various characteristics-physical, psychophysiological, personal, etc.

In the last decade, the tools of interactive virtual environments with immersion have been fruitfully used in world practice, both in research (communication, perceptual-cognitive, psychomotor human activity in the conditions of using interactive virtual environments with immersion, as well as the transfer of virtual individual and collective experience to the real world), and for psychotherapy and rehabilitation purposes.

Research is conducting from the perspective of a modern interdisciplinary approach, called Presence, or (body) presence in "virtual" reality. It proceeds from the fact that in reality, mediated by electronic means of transmitting and processing information, the subject experiences the effect of inclusiveness, which provokes him to perceive the simulated, animated reality as natural, non-mediated.

The phenomenology of Presence consists in the fact that the subject experiences the illusion of being in the same reality with objects or subjects that are not in the directly observed (non-mediated environment, augmented reality environment) reality of the individual. In this context, we are not talking about a situation of delusions or hallucinations; (body) presence is associating with the experience of being in a virtual (i.e. computer-simulated) reality of a computer game, Internet conferences, or VR systems.

The solution to this problem is associating with the development and use of virtual worlds (VM) technology, based on a deep immersion of a person in a certain environment and interaction with objects and characters in this environment, taking into account its various characteristics-physical, psychophysiological, personal, etc. Thus, VMS become a new technology for communication and collaboration between people and things.

Today, the world is actively conducting research on the use of VM to help individuals in all types of rehabilitation. In the last decade, VM tools have been successfully used in psychological laboratories and clinics, both for research and for psychotherapy and rehabilitation purposes.

The rapid development of ICT has opened up unprecedented opportunities for employment, education and socialization of people from families in need.

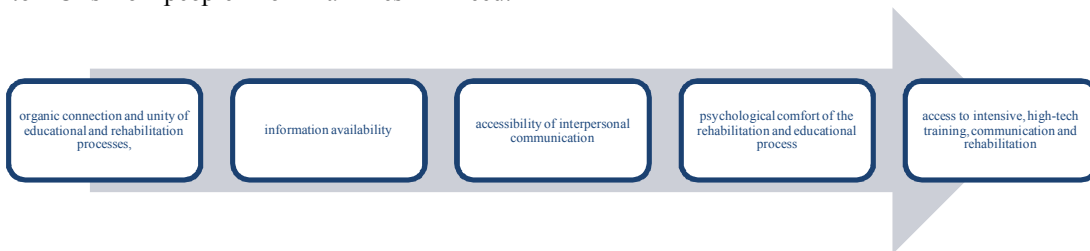
Many interested organizations at the national, regional and local levels have taken steps to increase access to ICTs for people from families in need.

Countries such as Sweden and the United States have already adopted ICT policies aimed at achieving sustainable development. The current level of information technology development allows us to create such devices and computer programs that can compensate for almost any restriction on human interaction with a computer, with the possible exception of certain limitations of mental abilities.

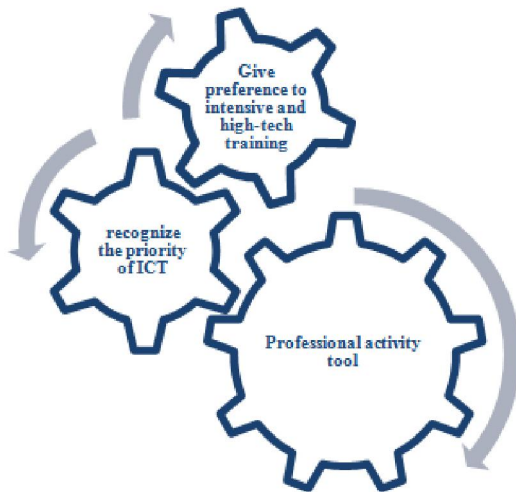
**Results**

Rehabilitation and educational technologies should provide, as shown in figure 2:

- organic connection and unity of educational and rehabilitation processes, optimal assimilation of educational material, both theoretical and practical;
- information availability;
- availability of interpersonal communication;
- psychological comfort of the rehabilitation and educational process;
- access to intensive, high-tech training, communication, and rehabilitation when access to them is difficult due to specific life restrictions.



**Fig.2. Directions of rehabilitation and educational technologies**



**Fig.3. The mechanism of the base of the system of continuous multi-level professional education**

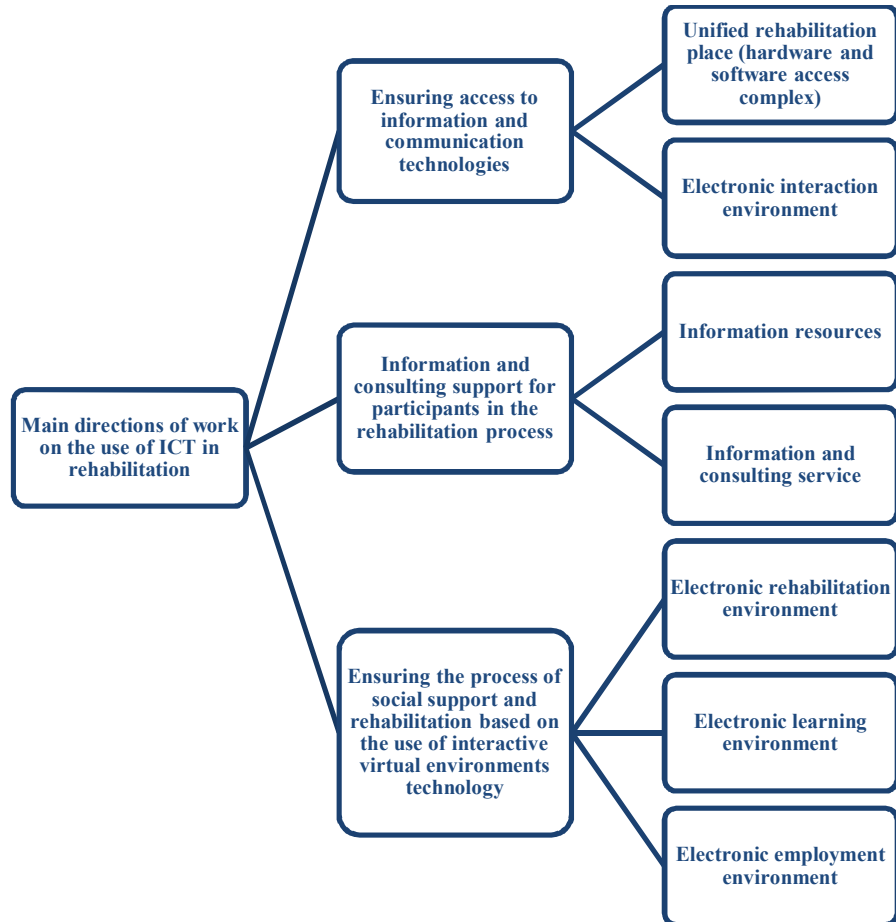
As shown in figure 3, forming the technological base of the system of continuous multi-level professional education of people from needy families, it is necessary to:

- first, give preference to intensive and high-tech training;
- secondly, to recognize the priority of information computer technologies that allow access to personal computers as a tool for professional activities and the performance of such activities that were previously difficult to access or even inaccessible due to specific limitations of life.

The analysis of foreign experience in using the tools of interactive virtual environments with immersion allows us to conclude that it is possible to use the tools of interactive virtual environments with immersion for various rehabilitation of people from families in need – medical (rehabilitation, prosthetics, psychological assistance), professional (career guidance, education and coaching, industrial adaptation), social (household), sports and recreation activities and sports.

Using the tools of interactive virtual environments with immersion for rehabilitation/education of people from families in need allows:

- take into account individual characteristics of human perception and processing of information;



**Fig.4. Main directions of work on the use of ICT in social support and rehabilitation of people from needy families.**

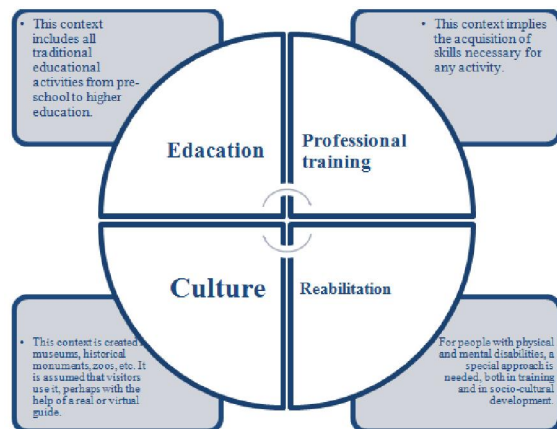
- contribute to the development of the necessary realism and interactivity and are therefore able to replace direct education, supporting the system of learning situations, providing new tools and methods of joint learning, accessible even to people who are physically located in remote places;
- acquire knowledge in ways that are not available in the real world;
- provide non-verbal communication related to a person's feelings and emotions, appearance and behavior.

The flexibility and portability of " virtual worlds " allows you to create virtual interactive environments for multiple contexts at once, as shown in figure 5:

*Education.* This context includes all traditional educational activities from pre-school to higher education. In this case, it is assuming that the educational virtual space is using by students under the supervision of teachers during classroom and practical classes, as well as distance learning.

*Professional training.* This context implies the acquisition of skills necessary for any activity. Technology and art are just some of the areas where

such training can become a daily practice. Virtual training can replace hands-on skills training, at least in the first stage of training.



**Fig.5. Virtual interactive environments**

*Culture.* This context is creating for museums, historical monuments, zoos, etc. It is assuming that

visitors use it, perhaps with the help of a real or virtual guide.

*Rehabilitation.* For people with physical and mental disabilities, a special approach is needed, both in training and in socio-cultural development. Virtual environments provide a wide range of opportunities for both the development of traditional forms of rehabilitation and the creation of new, innovative ones.

The use of the latest information and communication technologies will make it possible to perform more effectively the main tasks of social support for each family, since they provide, figure 6:

- introduction of modern special technologies based on the use of ICT, individual, which is especially important, programs and training conditions for families in need;
- information support of rehabilitation and educational processes in an accessible form;
- psychological comfort of rehabilitation and educational process;
- access to intensive technologies for comprehensive rehabilitation;
- creation of individual rehabilitation jobs and special working conditions for people from needy families, organization of remote forms of employment in virtual work collectives;
- creating conditions for entrepreneurial activity of families;
- incentives for businesses and organizations to create additional jobs;
- opening of new specialties and professions for family business in successfully developing areas of production activity (telecommunications, information, etc.)

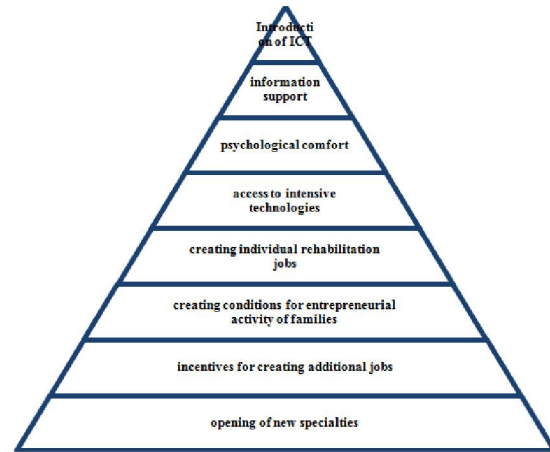


Fig.6. Solving social problems using ICT

The following areas of ICT use in social support and rehabilitation of people from needy families, figure 7:

- ensuring the management functions and tasks of Executive authorities and rehabilitation institutions that deal with problems and programs for the rehabilitation of people from needy families;
- ensuring availability of computer equipment and information and communication environment;
- information support for people from families in need;
- education and employment of people from families in need;
- automation of diagnostic methods in psychological and medical rehabilitation of people from needy families;
- use of interactive virtual environments with immersion for educational, psychotherapy and rehabilitation purposes for people from families in need.



Fig.7. ICT in social support and rehabilitation of people from needy families

## Conclusion

The Oila research center, together with a number of partner organizations, conducts research to identify problem families, prevent negative family situations, and study the impact of ICTs and the Internet on family stability and development. At the same time, priority is giving to promoting innovative ideas and initiatives in areas such as helping family members get out of the situation by introducing ICT skills to the population, especially young families. In particular, the Ministry of development of information technologies and communications, the youth Union of Uzbekistan is implementing the project "on the way to a strong family through information and communication technologies" on the basis of the Tashkent University of information technology named after Muhammad al-Khwarizmi, the Tashkent branch of Inha University.

Research Centre "Oila" provide study aimed to study the impact of information and communication technologies and the Internet on stability and development of families in this study was a one-week training courseon "ICT for strong families", designed for 20 hours of classroom training, 16 hours of ICT and 4 hours of psychological assistance for representatives of families in difficult situations. The project is aiming at acquiring knowledge on ICT, improving skills in modern technologies. One-week training courses "ICT for a strong family" are organized in all branches of the Tashkent University of information technologies named after Muhammad al-Khorezmi (Nukus, Urgench, Fergana, Karshi, Samarkand and Tashkent) and in the Tashkent branch of Inha University. There are two groups of fifteen students per month (women and men).

As a result of monitoring the educational activities of the weekly courses, over 11 months, about 1000 family members were trained, 119 of them were employed, and 44 will continue their studies at the three-month courses at the Union of youth and the Tashkent University of information technologies. The results of the training courses are very important for expanding the knowledge and prospects of family members, gaining knowledge on the correct and effective use of information and communication technologies and the Internet, acquiring skills to use ICT in everyday situations to obtain information, search, self-help, and most importantly, to build self-confidence.

Programs for the use of ICT in the sphere of social protection and support of people from needy families are mainly narrowly focused on ensuring specific functions and tasks of state Executive authorities in the social sphere, as shown in figure 4.

Developed countries have developed policies on the use of ICTs for social support and rehabilitation of people from families in need, which has generated widespread interest in society and the development of a market for services that provide social support and rehabilitation activities based on the use of ICTs.

The use of the latest innovative technologies based on the widespread use of ICTs presents huge opportunities not only in solving issues of managing processes and programs of social support and rehabilitation, but also, most importantly, in solving issues of implementing individual rehabilitation programs for each individual.

The existing open information resources in the world, in the form of websites and portals on the problems of social support and rehabilitation of people from needy families, are purely informational or educational in nature, without affecting technologies for social support and rehabilitation.

As a result of the development of the information society, all types of markets are being transformed, including the labor market. Remote work is firmly included in the reality of modern social and labor relations, and it is not opposed to the traditional employment system.

The modern level of information technology development allows creating such devices and computer programs that compensate for almost any restriction on human interaction with the computer and provide it with access to the information space.

Technologies of interactive virtual environments with immersion have a revolutionary significance for the development of innovative technologies and methods of social support and rehabilitation of people from needy families.

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