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Opportunities of Organisation of Disabled Persons' Telework

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Abstract

Problem of employment for disabled persons is partly related to continual improvements and technical achievements in labour market. In certain circumstances, telework increases the opportunity of employment of disabled persons. Analysis of disabled persons' answers to questionnaire indicated that most of the respondents have conditions to be involved in telework and that such work is acceptable to them. The authors of the article analyse the opportunities of organization of disabled persons' telework. Based on the carried out analysis, general telework organization system for the disabled is proposed, which could be presented as interrrelated, coherently functioning structure. Results of the carried out research are presented in the article.

Keywords: disabled persons, telework, quality of work, information technologies.

Introduction

More than 65 million disabled persons currently live in the European Union. That is more than 10 percent of all citizens in 27 European Union countries. Modern attitude to disabled persons is harmonized with conception of sustainable development and realizes principle of equal rights and opportunities. It is recognized that disabled persons are members of society with equal rights and opportunities, only with special requirements. Such an attitude is socially integrating and means the essential turning-point of social policy from special programs for disabled to creation of equal opportunities for them. Employment for disabled persons ensures not only greater financial safety, but also both independence and social integration. Social and economical integration of disabled persons is determined by humanistic attitude and evaluation of their potential employment as capital of the EU.

Methods of disabled persons' social integration and integration to labour market could be divided into two groups: passive methods or programmes of benefits for them and active methods or programmes of stimulation of their employment. We can see the progress from passive to active labour market policy in the European Union. Different methods of supporting disabled persons' employment are used, legal acts preventing discrimination are in force.

Problem of employment of disabled persons is partly related to permanent progressive changes and technical achievements in labour market. One of the objectives of Lisbon strategy is creation of information society helping to realize knowledge-based economy and create new work places. The new work organisation forms and application of information and communication technologies (ICT) not only require specific skills and competence, but also become cause of social exclusion for specific groups of employees, for example, for disabled persons. Discrimination could be connected with unequal access to work and education, public electronic services, networks and databases.

E-inclusion is connection of social inclusion with creation of information society. Digital opportunities are connected with new ICT services, opportunities of work and employment, overcoming of obstacles of distance and difficulty of mobility. Application of ICT at workplace has high importance for disabled persons' work, helps to compensate their physical limitation that is related to particular disability.

Conditions of information society allow an employee to be independent of work place and time. New work forms (mobile work and telework) spread. Telework is often recognised as remote work using services of remote connections and computers. Modern connection means, including Internet, supply opportunity to work being at any place, including at home. The main advantages of telework are increase in work productivity and decrease in costs, employee turnover, duration and costs of travel. According to scientists, telework will be spreading increasingly more rapidly.

Telework in particular circumstances creates for disabled persons the positive opportunity of choice. It is particularly important for people who beca-

me disabled after acquiring certain qualification and competence. Most of ICT managers are certain that telework at home could provide disabled persons with additional opportunities of employment, become guarantee of independence.

Telework opportunities for people with disabilities in the information society

Information technologies are rapidly developing, economic and social environment as well as character of work are changing, therefore new opportunities are emerging and new forms of work are developing. Telework is most often understood as an opportunity to carry out the work or part of it at home using computer, being connected with the employer via ICT means, it reduces the rate of unemployment and retains highly skilled specialists (Benchmarking..., 2000).

Virtual enterprises, e-commerce are closely linked to the common European labor market. Telework and other forms of virtual work became widespread over the past decade. Studies (Golden, 2007) have shown that telework is becoming increasingly popular. In Great Britain the popularity of telework during last eight years more than doubled, the number of teleworkers jumped to 2.4 million. In the EU there are nearly 3 million home workers as teleworkers, 30% of staff regularly telework.

The benefits of telework for employers (Steinhardt, 2007) are increasing labor productivity, declining costs, increased productivity, flexibility, better employment and customer service quality, lower energy consumption and environmental pollution, lower labor costs, greater opportunity to bring together a team, better employee selection, decreasing employee turnover.

The benefits of telework for employees are opportunity to choose their place of residence, flexible working hours, better work and family balance, possibility not to waste time and money on traveling, freedom from stress, ability to create a comfortable working environment for themselves, to avoid unnecessary meetings (Gajendran, Harrison, 2007).

One of the biggest challenges of telework is management problem that arises because of the additional requirements for managers and employees. Managers should learn how to manage remotely, evaluate work according to the results of the work, rather than by the time employees spend at the workplace. In addition, managers must learn to formulate good job task. Workers should learn to plan their work and their activities well, have good understanding of the tasks assigned to them by their supervisor, must also successfully solve everyday problems arising from small things. Telework may be done only when a worker has very clearly defined tasks. Successful telework requires certain management style and a good selection of remote workers (Nilles, 2007).

In different European countries, statistics for remote workers is very varied and very different percentage of them is in different business sectors. Development of telework is mostly influenced by the specific culture, traditions of individual companies and entire business sectors, the formed approach to work organization.

Bergum (2007) indicates that over the last 3-4 years interest of scientists in telework decreased. Forms of teleworking have changed. EU reduced the telework research, because its development was slower than expected. But Hansen (2008) argues that during the crisis in the U.S. and Canada employers in jobs preservation programs pay increasingly more attention to telework.

In European countries telework is not validated as a separate category of work, there is no standard definition of it. Studies by Montreuila, Lippel (2003) showed that development of telework place requires employer support. Employers must ensure that the computer and the software are adapted to the task, skill level and experience of the user, that they are applied in ergonomic environment. Telework is useful if there are well-defined tasks, assistance ir provided and appropriate equipment is used.

ICT plays a very significant role in all spheres of life of modern society, but not for all members of the public it is available. New technology not only requires specific skills and competencies, but also poses a risk of social exclusion of specific groups of workers, for example, people with disabilities. Xiberras (1994) notes that social exclusion is not a new phenomenon caused by changing information economy and widely used modern ICT, but use of ICT may create new forms of social exclusion.

The authors carried out a common analysis of non-participation in the labor market due to illness and disability and the use of computer at work in twenty-two EU countries.

Source of data on non-participation in labour market because of illness and disability in twenty-two EU member states is report of European Centre (European Centre for Social Welfare Policy and Research) (Study of compilation of disability..., 2007). Source of use of computers at work is European research on work conditions (Fourth European Working Conditions Survey, 2007).

To establish the correlation between non-participation in the labor market due to sickness and disa-

bility, and use of computer at work, correlation analysis was used and Pearson (linear relationship) correlation coefficient was calculated. Zero and alternative hypotheses were formulated:

H_0 – coefficient of correlation between non-participation in the labor market due to sickness and disability and the use of computer at work is zero;

H_1 – coefficient of correlation between non-participation in the labor market due to sickness and disability and the use of computer at work is not equal to zero.

Non-participation in the labor market due to sickness and disability and the use of computer at work Pearson correlation coefficient $r = 0.625$ shows an average positive correlation (the observed level of significance *p–level = 0.002*, correlation is very significant, the alternative hypothesis H_1 is confirmed). This leads to the assumption of a moderate positive relationship of these phenomena – increasing computerization of work also increases absence from work due to illness and disability. Logically, it can be well explained, because, as has been said, development of information technologies can lead towards the development of the digital divide, if e-inclusion of people with disabilities is not supported and encouraged. It can be argued that till 2007 e-inclusion rate was insufficient.

E-inclusion is necessary to reduce social exclusion. E-inclusion is one of the priorities of EU strategic framework *i2010 - European information society for growth and employment*, aimed at promoting economic growth and job creation in line with sustainable development.

In order to overcome the information divide for people with disabilities, to ensure equal opportunities to participate in the process of building the information society, it is necessary to adapt information environment, information systems and databases to them, to provide people with disabilities with special supportive equipment.

Persons with movement dysfunction (physical disabilities) cannot use conventional technologies and tools. Blind and visually impaired cannot use standard information environment, because visual presentation of information to them is not possible. Deaf and hardly hearing have problems when using means of communication, audible form of information presentation is not available for them. For persons with mental disabilities it is difficult to understand and process information. Moving towards an information society, it is necessary to take into account the needs of people with disabilities. Assistive technology has important implications for equality of the disabled in all spheres of life. It can compensate for limited opportunities and remove environmental barriers. Wider application of assistive technology may change the quality of life of people with disabilities.

Ideally, services and products in the information society are developed in accordance with the principle of *Design for all*, as it ensures equal opportunities for all users. Design for all strategy provides for such designing and building that different environments and products are accessible, comprehensible and functional for everyone. Production and access to services for disabled people is ensured at the design stage.

International definition of assistive technology given in the European Council Recommendation (Recommendation No. R (92) 6…, 1992) includes not only the traditional equipment, but any tool or a technical system that facilitates the movement, management, communications, environment control, and eases actions in personal life, education, profession, or social actions. Assistive technologies are listed in the ISO 9999 international standard (Enhancing Assistive Technology…, 2004), which is drawn with reference to WHO's ICF[1]. This standard provides that assistive technology is bought, modified or customized products, devices or equipment used by disabled persons with purpose to maintain, increase or improve their skills. Examples of computer assistive technologies are given in Table 1.

The application of ICT at the workplace has important implications for employment of people with disabilities. Application of ICT helps to compensate the shortcomings of physical disabilities (Klein at al., 2003).

While working on *IT Works* project, Blanck and Schartz (2001) examined the ICT curriculum, the relations of participating in the program disabled employees and employers of the disabled working at computerized working places. Four classes of factors affecting the integration of disabled people into ICT-based work were distinguished:

a) external factors: communication with the workplace, health care conditions, possibility of telework, micro - and macro-economic conditions, labor demand, labor market;
b) organizational factors: corporate culture, employment contract, suitability of assistive and accessible technology;
c) attitude factors: attitude of managers, colleagues and staff;
d) personal characteristics of a disabled: nature, the type and severity of disability, health, age, gender, economic status, education and family support.

[1] WHO's ICF – World Health Organisation's International Classification of Functioning, Disability and Health

Table 1

Assistive technologies for the disabled

Activity (WHO's ICF)	Assistive technologies (excerpt from ISO 9999 (2002))
EDUCATION AND APPLICATION OF KNOWLEDGE: education, application of received knowledge, thinking, decision making	Memories, personal computers and laptops, audio recording equipment, software, electronic calculators
CONNECTION: verbal, symbolic and signal messages, received and sent messages, conversations, using ICT	Interpreters of text, electronic and manual devices of communication, computer input and output equipment, phones and modified phones, radio and TV adapters, signal equipment
MOBILITY: changing of body position or moving from one place to another, moving and control of objects by using various ways of transportation	Manual and automated wheelchairs, sticks and walkers, modified vehicles, lifts, auxiliary maps.
SELF-SERVICE: independent caring, washing of self, dressing up, eating, drinking, health care	Modified tools for eating, non-skid mats, automated devices (robots), electric toothbrushes.
THE MAIN FIELD OF LIFE: tasks and actions needed for education, work and economic activity	Remote control equipment, fitted computerized working places, structural changes

Individual work places for the disabled must fit several criteria. For successful implementation of vocational rehabilitation of the disabled and their employment it is often necessary to adapt the workplace and use assistive technologies. Blanck and his colleagues believe that employers could allow flexibility in planning the employment and pay for assistive technology, but it is less likely that they will agree to arrange telework or provision of the disabled with auxiliary machinery (Blanck et al., 2003).

Needs of people with with movement disorders, multiple functions disorders, mental disability, blind, deaf must be considered. Having special adapted equipment disabled people can use common ICT resources.

Table 2

Actions to be taken to develop telework of people with disabilities

Level of company (employer)	Social level
Adaptation of work place for disabled persons.	Adaptation of transport and other environment for the disabled, seeking to guarantee voluntary choice of telework.
If telework is chosen voluntarily, any needed equipment and means of adaptation at home are paid by employer.	Free adaptation of needed ICT and software for disabled persons.
Work places should be created flexibly so that they would be appropriate for most employees.	Day centres and disabled persons' boarding-schools should be created for disabled persons who would like to be tele workers or participate in distance learning, good quality conditions of education and work for their customers should be ensured.
Conditions of telework should be examined in stage of chosing, paying attention to wishes of disabled workers.	Employment agencies should help disabled persons to connect with potential employers.

For people with disabilities from the first four groups the specific hardware, assistive technical means (adapted keyboards, touch pads, Braille lines, sensory panels, variously modified switches, voice synthesizers, and input devices) as well as software meeting the needs of these persons are essential. Technology for deaf personal at the workplace should be focused on visual presentation of information. All disability groups need Internet access. In addition, computer dictionaries, language editors, and voice synthesizers should be available. Workstations can take many forms: fixed, mobile, personal or multi-user. In certain circumstances, telework constitutes a useful option for disabled people. This is especially important for people who became disabled having already gained some practical skills and competencies. It could be people who suffered spinal injuries, with multiple sclerosis, with severe allergies and certain mental disorders.

Most scientists do not doubt that telework, when proper hardware and software is used, the ideal solution for disabled people. This view is dangerous because it classifies all people with disabilities into one category. In fact, there are many different types of disability and social groups of the disabled. Huvs (2000) thinks that the development of telework of disabled people opens up new opportunities and reduces discrimination against them, if there are a certain social practices on the level of institutions (employers) (see Table 2).

Telework can be not only a convenient choice, but also a guarantee of independence of the disabled.

The possibility of telework expands the potentiality and accessibility of work. This is the way to independence, dignity and membership in the community. Telework expands employment opportunities for workers who have permanent or temporary disability, are recovering from injuries or illnesses, but can work at home. Telework of the disabled in the EU is mostly organized through projects. They are not only an attempt to train future employees, but also to prearrange employment in the workplace. A strategy of agreement with employers that work places are adapted for the disabled and the disabled are being prepared to be employed in these places, is used.

Research on opportunities of organization of telework of the disabled in Lithuania. Research methodology

Analysing the opportunities of organization of telework of the disabled, Tatjana Bileviciene in January, 2009 carried out a research on the opportunities of organization of telework of the disabled (Bileviciene, 2009). The aim was to examine the suitability of persons with disabilities for telework and their readiness for telework and to examine opportunities of organization of telework of the disabled at Lithuanian companies.

The questionnaire survey method was used with a view to clarify the opinion of Lithuanian company managers and disabled persons on the use of telework opportunities. A questionnaire for disabled people and company managers was created. The questionnaire for the disabled consisted of 21 close-ended questions, questionnaire for managers of companies consisted of 24 closed-ended questions. The questions were intended not only to clarify the present situation, but also to find out the opinion of the respondents.

The research was divided into two stages: stage I – research on suitability of disabled persons and their readiness for telework (questionnaire of disabled persons); stage II – research on opportunities of telework at Lithuanian companies (questionnaire of managers of companies). The credibility of the presented questionnaires was evaluated by credibility coefficient Cronbach α. Values of the calculated coefficient allow to conclude that presented statements are reliable and measure information properly. Methods of descriptive statistics, correlation and factor analysis were used for analysing of data of the questionnaire.

Research on suitability of the disabled and their preparedness for telework

Questioning of the disabled is a psychologically complicated process, because these people are very reluctant to provide any information about themselves. Therefore, the questioning was conducted through the Lithuanian Society of the Disabled and Valakupiai Vocational Rehabilitation Centre.

The research was done by questionnaire method. Disabled respondents were chosen accidentally, 130 respondents were questioned. The estimated reliability coefficient of this questionnaire *Cronbach* $\alpha = 0.906$. Thus it can be concluded that the statements are reliable and measure information properly.

Research on telework opportunities at Lithuanian companies

The study was conducted using a questionnaire survey method. In total, 77 respondents were questioned (23 managers of social companies, 35 managers of social companies of the disabled, 19 managers of non-social organizations). Currently, Lithuania has 72 social companies of the disabled and 27 social companies, the research sample is charcterized by high representativity, sampling error $\Delta<0.01$. Companies were selected randomly from the social companies of the disabled and social companies that communicate with the Lithuanian Society of the Disabled and business development centers for the disabled, as well as via search on the Internet. The calculated reliability coefficient *Cronbach* $\alpha = 0.820$. Thus we conclude that the statements are reliable and measure information properly.

Research on opportunities of organization of telework of the disabled in Lithuania. Research results

Research on suitability of the disabled and their preparedness for telework

By age people with disabilities divided fairly evenly from 18 to 65 years. Percentage of women and men was the same – 50%. Most of the disabled people have movement disorders (47%) and suffer internal organ disease (23%).

The analysis of questionnaire data shows that only 11% of the respondents have no computer skills, for 86% disability does not restrict computer access, special programs are required for 5%, special equipment is necessary for 11% of the respondents. The majority of the respondents (86% of men and 68% of women) have computers at home, 68% of men and 57% of women have Internet access at home; this shows that respondents are suitable for telework.

Telework was previously known for 75% of men and 46% of women, 89% of men and 61% of women feel that telework is acceptable to them. Work at telework center is equally acceptable for men (75%) and for women (75%).

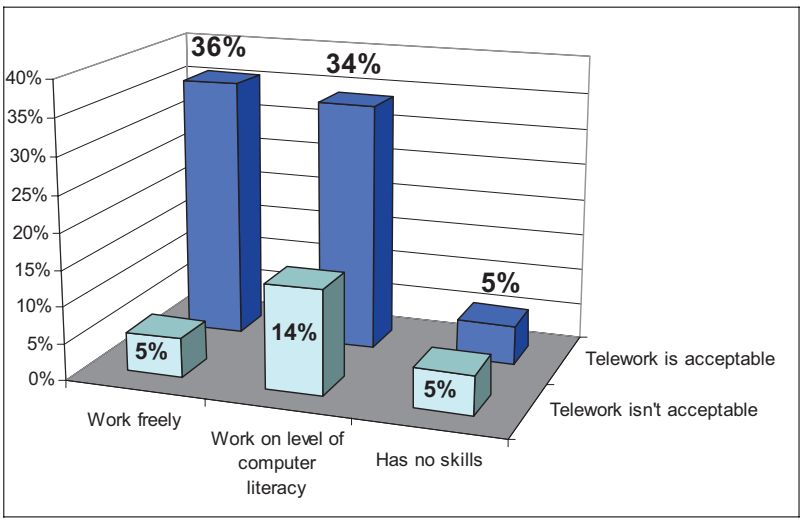


Fig. 1. Acceptability of telework and level of computer skills

Acceptability of telework depends on computer skill level (see Figure 1). For correlation between level of capacity for work and telework acceptability, see Figure 2.

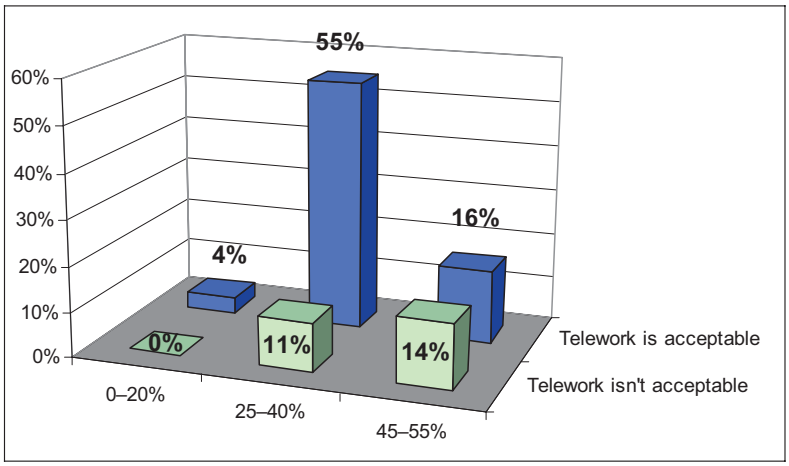


Fig. 2. Acceptability of telework and level of capacity for work

It can be assessed on what depend knowledge about telework and acceptability of telework. *Pearson chi-square* criterion was used to test the hypotheses. Conclusion is based on evaluation of observed level of significance (*p-level*). The analytical results are presented in Table 3.

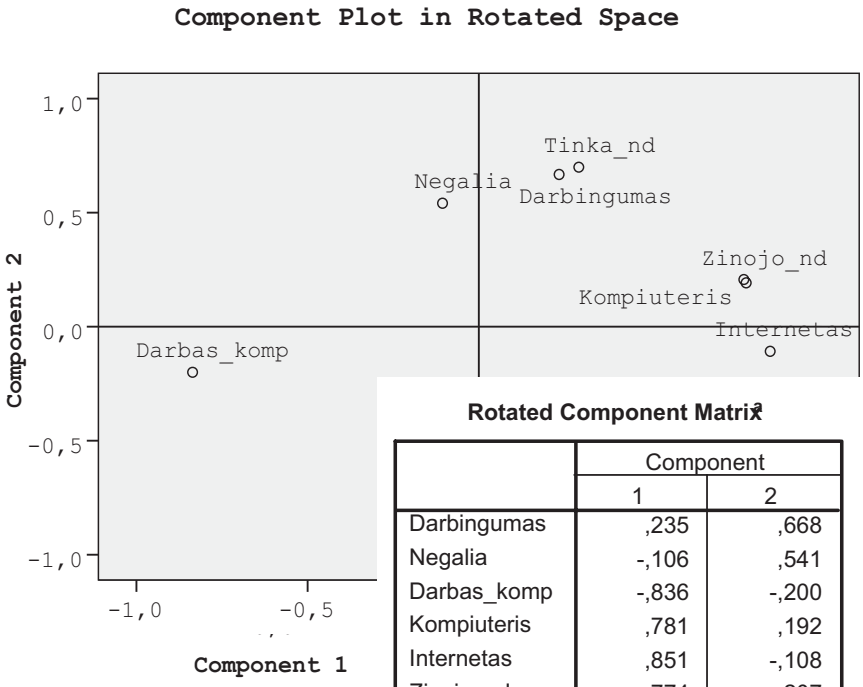
Table 3

Telework acceptance

Hypothesis	Observed level of significance	Selected level of significance	Confirmed hypothesis
H_0 – knowledge about telework does not depend on gender; H_1 – knowledge about telework depends on gender.	*p-level* = 0.002, *p-level* < α	α = *0.01*	H_1
H_0 – acceptability of telework does not depend on gender; H_1 – acceptability of telework depends on gender.	*p-level* = 0.000, *p-level* < α	α = *0.001*	H_1
H_0 – acceptability of telework does not depend on level of computer skills; H_1 – acceptability of telework depends on level of computer skills.	*p-level* = 0.107, *p-level* > α	α = *0.01*	H_0
H_0 – acceptability of telework does not depend on level of efficiency; H_1 – acceptability of telework depends on level of efficiency.	*p-level* = 0.000, *p-level* < α	α = *0.01*	H_1
H_0 – acceptability of telework does not depend on age; H_1 – acceptability of telework depends on age.	*p-level* = 0.002, *p-level* < α	α = *0.05*	H_1

Factors that affect telework acceptance of the disabled were established by the factor analysis method. *KMO* and *Bartlett's* test results (*KMO = 0.671, p-level = 0.000*) show suitability of data for factorial analyze.

According to *Kaiser* and *Catell scree* criteria there are two factors that explain 59.2% common dispersion of variables. The factor weights matrix (see Figure 3) offers an opportunity to describe determinants of acceptance of telework of people with disabilities. In this case, the first factor is the level of ICT use (it is associated with variables: level of computing – *Darbas_komp*, owning a computer at home – *Kompiuteris*, Internet access at home – *Internetas*, previous knowledge of telework – *Zinojo_nd*), the second factor is the level of job opportunities (this is associated with variables: capacity for work – *Darbingumas*, nature of disability – *Negalia*, telework acceptance – *Tinka_nd*).



Rotated Component Matrix[a]

	Component	
	1	2
Darbingumas	,235	,668
Negalia	-,106	,541
Darbas_komp	-,836	-,200
Kompiuteris	,781	,192
Internetas	,851	-,108
Zinojo_nd	,774	,207
Tinka_nd	,292	,699

Fig. 3. Analysis of the factors that affect telework acceptance of the disabled

Research on telework options for Lithuanian companies

Analysis of application of ICT in business activities shows a relatively high level of use of e-mail (100%), mobile (96%) and computer networks (65%). However, the virtual interaction with colleagues and customers is preferred by only 17% of the companies. Seeking to find out statistical relationship of telework and the new advanced information technology at companies we formulate null and alternative hypothesis:

H_0 – knowledge of teleworking does not depend on application of new technologies;

H_1 – knowledge of teleworking depends on application of new technologies.

Pearson chi-square criterion was used to test the hypothesis. Conclusion was based on evaluation of observed level of significance *p-level = 0.121*. We choose the level of significance $\alpha = 0.05$, the observed level of significance *p-level* > α. The zero hypothesis is confirmed: knowledge about teleworking does not depend on level of application of new technologies at the company.

Most company managers (70%) believe that telework is appropriate for the organization if it is suitable for the nature of work, 13% – if the disabled persons have difficulties to come to the workplace, but only 29.9% of managers said that the company has opportunities for telework, only 9.1% of businesses use telework, and only 3.9% of companies plan to arrange telework places for the disabled within the next 12 months.

However, a significant part of company managers indicated how telework can be used in the company for people with disabilities: accounting (32.5%), e-trade (14.3%), accounting work (27.3%), clerical work (46.8%), relationships with customers (26%), management of computer programs (16.9%), network administration (19.5%), computer-aided design (6.5%), and design (3.9%).

After analysis of respondents' answers concerning the problematic issues which have been assessed using a 5-point Likert scale, we calculated the average of assessments of the issues. Potential positive and negative effects of telework are presented in Table 4. We see that access to employment of people with disabilities is pointed out as the main positive effect, and possible exclusion of employees on lack of direct communication – as the major negative effect.

Table 4

Potential positive and negative effects of telework

Positive effect	Average level	Negative effect	Average level
Economizing finances of company (no need to maintain the work place, pay for transport, time of breaks)	3.91	Company spends more money to maintain communications	3.64
Saving environment (transport is not used)	3.84	Company has no possibility to control work process, work time, intermediate results	3.73
Increasing effectiveness of work	3.36	There is possible exclusion of workers because of lack of direct communication	3.91
Increasing accessibility to work for disabled persons	4.40		
Improving balance of time of work and rest	3.61		
Increasing flexibility of work	3.84		

The respondents indicated that the greatest influence on the decision of arrangement of the disabled persons' telework places is made by the wish to employ people with disabilities. All respondents agreed with the statement that establishing disabled persons' telework places must be seen as reasonable job arrangement (18% agreed completely, 52% agreed, yes and no – 30%). There were no negative responses. Respondents consider that for arrangement of telework places for the disabled the most important is professional experience of employees participating in the process of organization of telework.

Process of arrangement of telework places for persons with disability

The main objective of organization and development of telework of the disabled is to increase the opportunities of inclusion of persons with disabilities in the labor market, improve the quality of employment of disabled people. Analysis of problems of telework, employment and e-inclusion of persons with disabilities leads to the conclusion that establishment and development of employment of people with disabilities is a complex work the success of which depends on many social and economic factors.

With reference to the carried out analysis, the authors believe that general system of organization of telework of people with disabilities can be represented as interrelated, harmoniously functioning structure. The creation and development of this system depends on development of legal base, creation of economic conditions, development of e-inclusion and e-accessibility, development of e-inclusion and e-accessibility for the disabled, development of telework and e-commerce and realisation of policy of employment of the disabled persons.

Theoretical stages of process of creation of telework places for the disabled can be identified by using the findings in the analyzed theoretical material, results of research into primary and secondary data, material of expert interview, by examining results of analysis of experience of the carried out employment and telework projects for the disabled.

Hunt (1999) describes the management of employment of the disabled people as a work place adaptation and restoration of capacity for work with a view to support the employment of disabled people. The aim of management of employment of the disabled is prevention of unemployment of the disabled and intermediation to help the disabled to return to work. Hunt points out actions of the successful programs of management of employment of the disabled people:

1. Commit to provide the necessary assistance to the disabled, encourage to return to work.
2. Make analysis of the incentive scheme and of the policy of management the employment of disabled people and apply it.
3. Distribute tasks and responsibilities of management of employment of disabled people at appropriate levels.
4. Create an effective integrated information system for data analysis, management and evaluation.
5. Teach managers.
6. Organize process of return to work of people with disabilities.
7. Systematically apply rehabilitation measures.

8. Make professional examination of adaptation of work place for the disabled.
9. Cooperate with rehabilitation services.

The authors believe that these principles can be applied to organization of telework of the disabled as well. Generalizing the theoretical and empirical research, the authors propose to distinguish the main stages of creation of telework places for the disabled:

1. Identification of the level of disabled persons' capacity for work and demand for services of vocational rehabilitation.
2. Promotion of telework.
3. Motivation for telework.
4. Evaluation of suitability for telework.
5. Harmonization of requirements of work place and disabled persons' possibilities to work.
6. Employment and support at work.

Feasibility of each stage can be defined separately.

Stage 1 – identification of the level of disabled persons' capacity for work and demand for services of vocational rehabilitation

At this stage, following the functional, professional and medical criteria experts determine the level of disabled person's capacity for work and his abilities to do the work. Assessment of what rehabilitation services are needed for the disabled person is done. It is now possible to determine the suitability of people with disabilities namely for telework. The evaluation of level of disability in percentage mainly reflects the medical criteria; there is almost no consideration of the disabled person's individual resources, especially the varying ability to complete certain work. Therefore, upon detection of such jobs that are not (or almost not) influenced by the nature and degree of disability the disabled person's capacity for work can greatly increase.

Stage 2 – promotion of telework

The carried out research showed that 75% of males and 46% of women surveyed knew about telework and its opportunities. Company managers' knowledge about telework does not depend on level of application of new technologies at the company. This means that for a substantial number of people with disabilities and employers the corresponding information is unavailable and they are not interested in telework. Information about telework can be provided by labor market, the media (also the internet). The information on the internet is particularly important, because it costs little and reaches the target group members who already have computer skills and access to ICT.

Stage 3 – motivation for telework

Differences in human behavior and its motives when seeking aim are explained by motivation –assumptions about the factors that caused the activities and gave them direction. The modern conception of motivation includes not only external but also internal motivation, revealing the sources, which are in a human personality and which determine job satisfaction.

For disabled people internal and external motivation is relevant, too. For most people with disabilities it is very important to feel needed. When using the telework model it is important to interest the disabled in opportunities of not any work, but exactly telework. The motivation to do telework would provide the disabled with opportunities to overcome their disabilities, to change their social status. The carried out researches showed that acceptability of telework depends on sex, level of capacity for work, age or nature of disability, rather than on the level of skill of computer work. Thus, for each group of people with disabilities it is necessary to apply different methods of motivation.

Employers' motivation is an opportunity to benefit from privileges and subsidies for setting up the work places for the disabled, while exploiting the benefits of telework. 70% of company managers think that telework of the disabled is appropriate for the organization, but telework is practiced in only 9.1% of the companies. This reflects the low motivation of employers, the lack of attention to this problem from structures for vocational rehabilitation of disabled persons.

Already at the stage of identification of needs for vocational rehabilitation it is very important to clarify for the disabled the possibilities and advantages of telework. At this stage, people with disabilities should interact with specially trained intermediaries, psychologists, social workers who have in-depth knowledge of peculiarities of telework.

Stage 4 – evaluation of suitability for telework

A qualification assessment specialist together with a doctor and a specialist in ICT should determine whether persons with disabilities are suitable for telework. The scheme of this process is presented in Figure 4.

A doctor should evaluate the damage to health and organism of the disabled and to discuss with ICT specialist the possibilities to compensate these deficiencies through ICT (assistive technology). In addition, the ICT specialist has to point out the potential impact of computer work on the disabled, and the doctor has to decide whether the person can perform certain tasks (and how long he can work). ICT specialist

draws up a list of necessary compensatory equipment and programs that are necessary and appropriate to employ the disabled. Accuracy of medical report depends on the doctor's understanding about the suitability of a particular job for a specific employee. Medical consultant must be familiar with the work area to the company; it must be provided with a detailed description of the duties of the employee indicating

- job characteristics and physical demands of work;
- personal qualities;
- working hours and willingness to work flexibly;
- intellectual and emotional requirements, potential stressors;
- expected work results;
- work contract conditions;

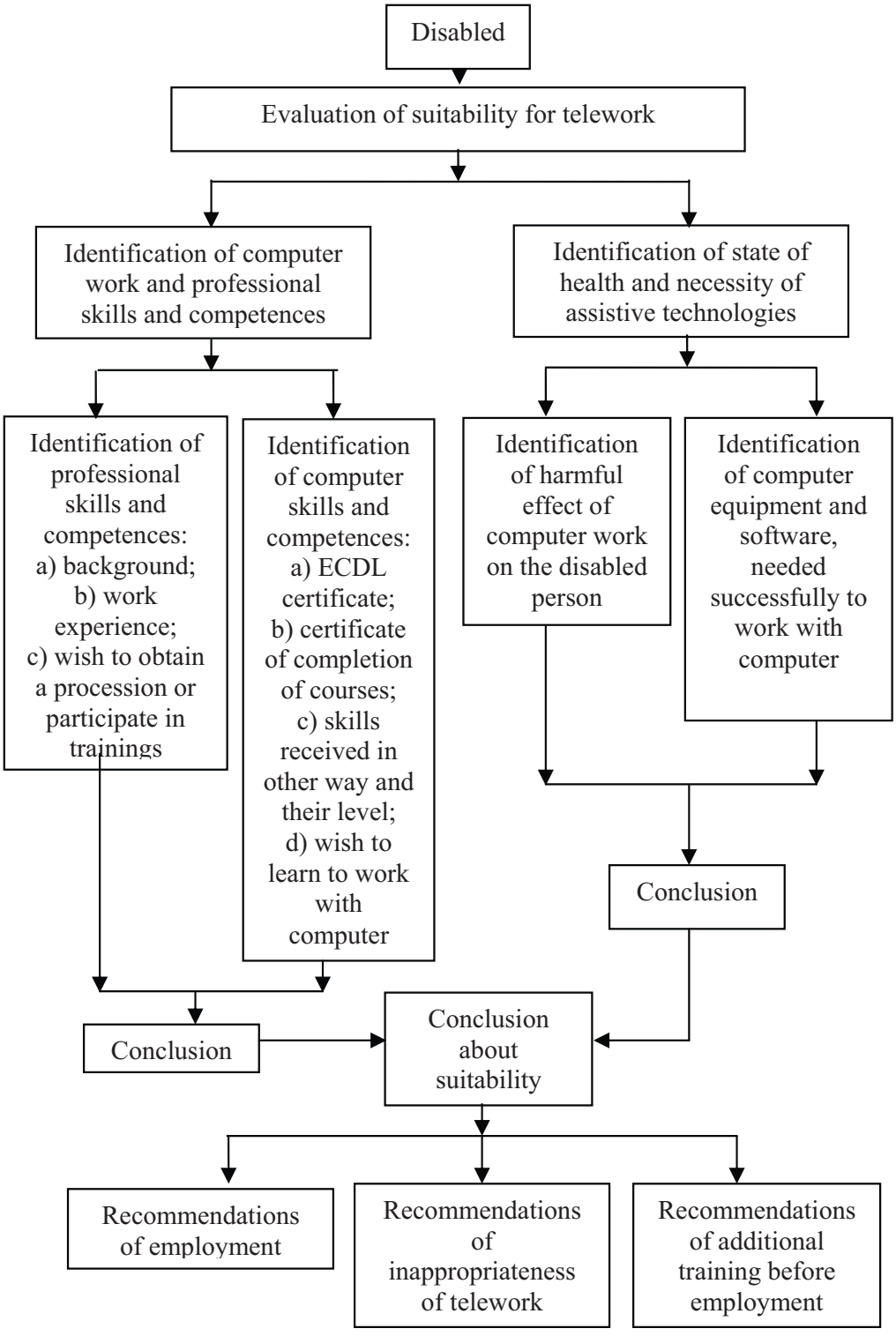


Fig. 4. Evaluation of disabled persons' suitability for telework

Possibilities of compatibility of computer equipment (ICT) and physical condition

1. People with disabilities with chronic illnesses of internal organs, blood circulation, heart and respiratory organs do not have obvious functional disorders, but due to flared-up disease or disease-related quick fatigue cannot work at the office continuously. Then the doctor must first determine whether such a person can operate a computer (for example, a person having a heart pacemaker), and for how long. Doctor's recommendations may include tele-working from home, alternative telework with part-time working at the office, mobile telework. These people with disabilities usually have a profession and education, so they could do ordinary work, only in new conditions. Additional equipment and software are not necessary.

2. Disabled people with hearing problems are, in most cases, physically healthy, but due to disability it is difficult for them to communicate. Their education may be various. Working on the open market, they sometimes have communication problems. Working with a computer they can replace direct communication with communication via e-mail, Skype. In this case, disabled people do not need to always work at home, mobile telework and computerized work place are both suitable. No additional equipment is required, but internet access and e-mail (or Skype) are necessary.

3. Blind and partially sighted people can work at home doing telework and thus avoid commuting problems. However, their work on a computer requires special equipment and relatively expensive software. Most often those people with disabilities cannot acquire assistive equipment by themselves, therefore hiring such an employee the employer must provide for ways of supply of employee with auxiliariy equipment and software.

4. Disabled people with mobility problems (sitting in a wheelchair). In this case, very important is the degree of disability, since on it depends whether additional equipment is needed, or it is enough to set up a remote work place. Disabled people with only legs affected and upper body and hands healthy enough can do telework at home, do alternative telework, work at telework centers (no assistive computer technology is required). Paralyzed people with disabilities, hardly moving hands, can do telework, but to control computer they need special technical measures, starting with remote mouse having an infrared port, and ending with eye-controlled systems and voice recognition technology.

5. Disabled people with mental health disorders (epileptics, schizophrenics). Due to mental state they sometimes cannot work in a team, to leave home. In this case, additional equipment is not required, telework from home or hospital is possible.

6. Mentally retarded persons with disabilities. Due to slowness of thinking it is best for them to do telework at home, doing simple operations.

It should be noted that properly selected telework can be done by most of the disabled. The carried out researches have shown that a relatively large proportion of people with disabilities now have computer skills, computer and Internet access, most of them do not need assistive technology. Thus, they almost do not need special preparation for telework.

Through testing we can determine whether the workplace suitable for telework. 29.9% of questioned company managers said that they can establish a workplace for remote computer work.

Stage 5 – harmonization of requirements of work place and opportunities of disabled person's work, trainings

This step is very important in organizing telework of the disabled, because it realizes the principles of compatibility of employment flexibility when offering work and of flexibility of work conditions of a disabled. Organization of telework can be viewed as application of flexible working methods, which is in part related to application of innovative technologies at the company.

At this stage, the method of reasonable accommodation manifests: employer's requirements for the remote employee coordinated with a help of a mediator (duties, required qualifications, work mode, way of of telework) and requirements for setting up a remote workplace for the disabled. The stage starts with job search, and setting up of remote workplace and (or) identification of opportunities of employment at remote workplace. In determining the opportunities of setting up a telework place and employment at remote workplace, work with employers is carried out. ICT professionals-mediators must continually communicate with representatives of the company. The aim of the mediators is to find out whether employers offer telework places (not necessarily for the disabled), to advise employers to adapt work tasks for telework or to establish telework places.

During mediation it can be discussed, who sets up the workplace – whether an employer installs the necessary hardware and software at home of a disabled person (telework center), or the disabled has such equipment at home, or work will be done in a already arranged telework center. There are also discussed the legal issues – conditions of employment, privileges for employer for setting up of work place, possibilities of compensation for additional equipment. Where appropriate and in agreement with the employer may be done additional training for the disabled or his/her preparation for work. Standard or employer-proposed programs of vocational rehabilitation, trai-

ning and qualification improvement may be used for this purpose. A very important point of this stage is the development of telework management skills of disabled people and employers.

Stage 6 – employment and support at work

When hiring people with disabilities mediators should participate – social workers with the ICT skills (or ICT professionals prepared to work with the disabled), and lawyers. Lawyers help to establish labour relations, solve possible conflicts and problems. ICT professionals control the equipment and maintenance of telework place. They must assess the suitability, safety, and ergonomics of the workplace.

The proposed system of organization of telework of the disabled people is charcterized by integrity and consistency. It allows one to involve persons with disabilities in meaningful activities, to control the recruitment process from motivation to employment and permanent control of working conditions.

Conclusions

1. Adaptation of information environment, information systems and databases and provision of disabled persons with assistive technologies are required for e-inclusion of disabled persons. Assistive technologies for disabled persons could compensate for limits of abilities and remove obstacles in environment. The main criteria when choosing assistive technologies should be not price, but quality, durability, and comfort of use. Telework and modern forms of work organisation became the important aspects in creation of new working places in the European Union. Telework decreases level of unemployment. Nowadays in foreign countries telework is often used for retention of work places (for example, in the USA and Canada about 30% of work places' retention programmes are organisation of telework). Statistical researches and analysis of theoretical material confirmed that economic competitiveness of a country depends not only on ICT, but also on level of application of telework. ICT application in the workplace has an impact on level of non-participation in the labor market due to sickness or disability.

2. Telework creates new work opportunities for disabled persons. Researches confirm that suitability of telework for disabled persons depends on their personal characteristics: age, gender, and capacity for work. Application of telework in companies depends on opportunities of organisation of work place and preparation of disabled persons for such work as well as on availability of assistive technologies. The carried out researches indicated that such work in Lithuania is almost not used, only 9.1 percent of companies that participated in the research use telework method and only 3.9 percent of companies are planning to create the telework places for disabled persons in the nearest twelve months.

3. The common model of organisation of disabled persons' telework should involve such six stages: identification of the level of disabled persons' capacity for work and demand for services of vocational rehabilitation, presentation of information concerning opportunities of telework, realisation of policy of development of employment and telework, realisation of programme of vocational rehabilitation, supply (rent) of additional computerized assistive equipment, professional training, professional orientation and consultation. It is recommended to start the organisation of telework from presentation of information concerning opportunities and advantages of telework for disabled persons and employers and from their motivation to practice exactly this method of work. Telework can be recommended for disabled persons with different level of capacity for work.

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Neįgaliųjų nuotolinio darbo organizavimo galimybės

Santrauka

Europos Sąjungoje (ES) šiuo metu gyvena daugiau nei 65 mln. neįgaliųjų. Tai sudaro daugiau kaip 10 proc. visų ES gyventojų. Negalią turintys asmenys, kaip ir kiti visuomenės nariai, turi poreikį užsiimti prasminga veikla, teikiančia naudos visuomenei ir pačiam neįgaliajam. Neįgaliesiems nelengva konkuruoti darbo rinkoje, bandant įsidarbinti – jie susiduria su gana aukštais darbdavių reikalavimais. Neįgaliųjų atskirtis nuo darbo rinkos išlieka neproporcingai didelė. Užimtumo problema neįgaliesiems yra iš dalies susijusi su nuolatiniais poslinkiais ir technikos pasiekimais darbo rinkoje.

Informacinės visuomenės sąlygos leidžia darbuotojui neprisirišti prie darbo vietos ir darbo laiko. Statistiniai tyrimai ir atlikta teorinės medžiagos analizė patvirtino, kad šalies ekonominis konkurencingumas priklauso ne tik nuo IRT, bet ir nuo nuotolinio darbo taikymo lygio. IRT taikymas darbo vietoje turi įtakos nedalyvavimo darbo rinkoje dėl ligos ir negalios lygiui. Nuotolinis darbas namuose padidina neįgaliųjų įsidarbinimo galimybę, gali suteikti neįgaliesiems geresnę galimybę gauti darbo vietas. Tai ypač svarbu žmonėms, kurie tapo neįgalūs jau įgiję tam tikrą praktinio darbo kvalifikaciją ir kompetenciją. Nuotolinio darbo galimybė plečia potencialaus ir prieinamo darbo sritis. Nuotolinis darbas tam tikromis aplinkybėmis sudaro neįgaliesiems teigiamą pasirinkimo galimybę. Nuotolinis darbas gerina neįgaliųjų užimtumo kokybę, suteikia galimybę darbdaviams taupyti išlaidas ir didinti efektyvumą, o darbuotojams – dirbti nesant darbo vietoje, lanksčiai organizuoti savo darbo laiką. Daugeliui nuotolinių darbuotojų darbas namuose – tai patogumas. Neįgaliesiems jis gali tapti nepriklausomybės garantija – tai kelias į savarankiškumą ir socialinę integraciją. Neįgaliųjų nuotolinio darbo galimybių teorinė analizė parodė, kad taikant pagalbines technologijas nuotolinis darbas tampa prieinamas skirtingo negalios tipo ir skirtingo darbingumo lygio neįgaliesiems, gerina neįgaliųjų užimtumo sąlygas.

Analizuodama neįgaliųjų nuotolinio darbo organizavimo galimybes 2009 m. sausio mėn. Tatjana Bilevičienė atliko neįgaliųjų nuotolinio darbo organizavimo galimybių tyrimą. Tyrimo tikslas – išnagrinėti neįgaliųjų tinkamumo ir pasirengimo nuotoliniam darbui galimybes ir išanalizuoti neįgaliųjų nuotolinio darbo organizavimo Lietuvos įmonėse galimybes. Lietuvos įmonių vadovų ir neįgaliųjų nuomonei dėl nuotolinio darbo taikymo galimybių išsiaiškinti taikytas anketinės apklausos metodas. Sukurti klausimynai neįgaliesiems ir įmonių vadovams. Neįgaliųjų klausimyną sudarė 21 uždaro tipo klausimas, įmonių vadovų klausimyną – 24 uždaro tipo klausimai. Klausimais buvo siekiama ne tik konstatuoti esamą situaciją, bet ir sužinoti respondentų nuomonę. Tyrimas suskirstytas į du etapus: I etapas – neįgaliųjų tinkamumo ir pasirengimo nuotoliniam darbui tyrimas (neįgaliųjų anketinė

apklausa); II etapas – nuotolinio darbo Lietuvos įmonėse galimybių tyrimas (įmonių vadovų anketinė apklausa). Neįgaliųjų apklausa – tai psichologiškai sudėtingas procesas, nes šie žmonės labai nenoriai teikia bet kokią informaciją apie save. Todėl apklausa buvo atlikta pasitelkus Lietuvos neįgaliųjų draugiją ir Valakupių profesinės reabilitacijos centrą. Pateiktų klausimynų patikimumas buvo vertinamas patikimumo koeficientu Cronbach α. Apskaičiuotos koeficiento reikšmės leidžia daryti išvadą, kad sudaryti teiginiai yra patikimi ir tinkamai matuoja informaciją. Apklausos duomenų analizė atlikta aprašomosios statistikos, koreliacinės ir faktorinės analizės metodais.

Apklausos rezultatų analizė rodo, kad darbo kompiuteriu įgūdžių neturėjo tik 11 proc. respondentų, 86 proc. apklaustųjų negalia darbo kompiuteriu galimybių neriboja, specialios programos reikalingos 5 proc., speciali technika būtina 11 proc. apklaustųjų. Daugelis respondentų (86 proc. vyrų ir 68 proc. moterų) turi namuose kompiuterius, 68 proc. vyrų ir 57 proc. moterų turi namuose interneto prieigą Tai rodo, kad respondentai yra pasirengę dirbti nuotolinį darbą. Apie nuotolinį darbą anksčiau žinojo 75 proc. vyrų ir 46 proc. moterų. 89 proc. vyrų ir 61 proc. moterų mano, kad nuotolinis darbas jiems priimtinas. Darbas nuotolinio darbo centre vienodai priimtinas ir 75 proc. vyrų, ir 75 proc. moterų. Neįgaliųjų apklausos rezultatų analizė parodė, kad dauguma respondentų turi sąlygas dalyvauti nuotoliniame darbe ir kad toks darbas jiems priimtinas. Koreliacinės analizės rezultatai parodė, kad nuotolinio darbo priimtinumas priklauso nuo lyties, darbingumo lygio, amžiaus, bet nepriklauso nuo darbo kompiuteriu įgūdžių lygio.

Veiksniai, nuo kurių priklauso neįgaliųjų nuotolinio darbo priimtinumas, nustatyti faktorinės analizės metodu. Išskiriami du veiksniai, kurie paaiškina 59,2 proc. bendrosios kintamųjų dispersijos. Veiksnių svorių matrica suteikia galimybę apibūdinti neįgaliųjų nuotolinio darbo priimtinumą lemiančius veiksnius. Šiuo atveju pirmas veiksnys – ICT naudojimo lygis (šis veiksnys susijęs su kintamaisiais: darbo kompiuteriu lygis, kompiuterio namuose turėjimas, interneto prieiga namuose, ankstesnis nuotolinio darbo žinojimas), antras veiksnys – darbo galimybių lygis (šis veiksnys susijęs su kintamaisiais: darbingumo lygis, negalios pobūdis, nuotolinio darbo priimtinumas).

Įmonių vadovų apklausos rezultatų analizės duomenimis, 70 proc. įmonių vadovų mano, kad tikslinga organizuoti nuotolinį darbą, tačiau šį darbo būdą naudoja tik 9,1 proc. įmonių. Tačiau nemažai įmonės vadovų nurodė, kokį nuotolinį darbą galėtų dirbti neįgalieji įmonėje: apskaita (32,5 proc.), e. prekyba (14,3 proc.), buhalterinis darbas (27,3 proc.), raštinės darbai (46,8 proc.), ryšiai su klientais (26 proc.), kompiuterinių programų tvarkymas (16,9 proc.), tinklo administravimas (19,5 proc.), kompiuterinis dizainas (6,5 proc.), projektavimas (3,9 proc.). Išanalizavus respondentų atsakymus į probleminius klausimus, kuriems vertinti buvo taikoma 5 taškų Likerto skalė, apskaičiuoti nagrinėjamų problemų įverčių vidurkiai. Neįgaliųjų darbo prieinamumas nurodytas kaip svarbiausias teigiamas poveikis, įmanoma darbuotojų atskirtis dėl tiesioginio bendravimo trūkumų – kaip svarbiausias neigiamas poveikis. Respondentai nurodė, kad didžiausios įtakos priimant sprendimą dėl neįgaliųjų nuotolinio darbo vietų steigimo gali turėti noras įdarbinti neįgaliuosius. Visi respondentai sutiko su teiginiu, kad neįgaliųjų nuotolinės darbo vietos steigimas turi būti vertinamas kaip tinkamas darbo vietos pritaikymas.

Pagrindinis neįgaliųjų nuotolinio darbo organizavimo ir plėtros tikslas – didinti neįgaliųjų įtraukties į darbo rinką galimybes, gerinti neįgaliųjų užimtumo kokybę. Atlikta nuotolinio darbo ir neįgaliųjų užimtumo bei e. įtraukties problemų analizė leidžia daryti išvadą, kad neįgaliųjų nuotolinio darbo kūrimas ir plėtra – tai kompleksinis darbas, kurio sėkmė priklauso nuo daugelio socialinių ir ekonominių veiksnių.

Remiantis atlikta analize, teigtina, kad neįgaliųjų nuotolinio darbo organizavimo bendrą sistemą galima pavaizduoti kaip tarpusavio ryšiais susijusią, darniai veikiančią struktūrą. Šios sistemos kūrimas ir darni plėtra priklauso nuo teisinės bazės plėtros, ekonominių sąlygų kūrimo, e. įtraukties ir e. prieinamumo plėtros, e. įtraukties ir e. prieinamumo neįgaliesiems plėtros, nuotolinio darbo ir e. verslo plėtros bei neįgaliųjų užimtumo politikos vykdymo. Teorinius neįgaliųjų nuotolinio darbo vietų kūrimo proceso etapus galima išskirti taikant išnagrinėtos teorinės medžiagos išvadas, pirminių ir antrinių duomenų tyrimo rezultatus, ekspertinės apklausos medžiagą, įgyvendintų neįgaliųjų užimtumo ir nuotolinio darbo projektų patirties analizės rezultatus.

Apibendrinant daromos tokios išvados:

1. Įgyvendinant neįgaliųjų e. įtrauktį reikia pritaikyti neįgaliesiems informacinę aplinką, informacijos sistemas ir duomenų bazes bei aprūpinti neįgaliuosius pagalbine technika. Pagalbinės technologijos neįgaliesiems gali kompensuoti galimybių apribojimą ir panaikinti aplinkos kliūtis. Pagrindiniais kriterijais pasirenkant pagalbines technologijas turi būti ne kaina, o kokybė, ilgaamžiškumas, naudojimo patogumas. Nuotolinis darbas ir šiuolaikinės darbo organizavimo formos tapo svarbiais aspektais kuriant naujas darbo vietas ES. Nuotolinis darbas mažina nedarbo lygį. Šiuo metu užsienio šalyse nuotolinis darbas dažnai pasitelkiamas darbo vietoms išsaugoti (pvz., JAV ir Kanadoje apie 30 proc. darbo vietų išsaugojimo programų sudaro nuotolinio darbo organizavimas). Statistiniai tyrimai ir teorinės medžiagos analizė patvirtino, kad šalies ekonominis konkurencingumas priklauso ne tik nuo IRT, bet ir nuo nuotolinio darbo taikymo lygio. IRT taikymas darbo vietoje turi įtakos nedalyvavimo darbo rinkoje dėl ligos ir negalios lygiui.

2. Nuotolinis darbas sudaro neįgaliesiems naujas užimtumo galimybes. Tyrimai patvirtino, kad nuotolinio darbo tinkamumas neįgaliesiems priklauso nuo asmeninių jų savybių: amžiaus, lyties, darbingumo lygio. Nuotolinio darbo taikymas įmonėse priklauso nuo darbo vietos organizavimo ir neįgaliųjų paruošimo tam darbui galimybių bei pagalbinių technologijų prieinamumo. Atlikti tyrimai parodė, kad Lietuvoje toks darbas praktikuojamas nepakankamai: tik 9,1 proc. tyrime dalyvavusių įmonių naudoja nuo-

tolinio darbo būdą ir tik 3,9 proc. įmonių planuoja įrengti nuotolinio darbo vietas neįgaliesiems per artimiausius 12 mėnesių.

3. Bendras neįgaliųjų nuotolinio darbo organizavimo modelis turi apimti šešis etapus: neįgaliųjų darbingumo lygio ir profesinės reabilitacijos paslaugų poreikio nustatymas, informacijos apie nuotolinio darbo galimybes teikimas, užimtumo ir nuotolinio darbo plėtros politikos įgyvendinimas, profesinės reabilitacijos programos įgyvendinimas, papildomos kompiuterizuotos pagalbinės technikos tiekimas (nuoma), profesinis mokymas, profesinis orientavimas ir konsultavimas.

Rekomenduojama nuotolinio darbo organizavimą pradėti nuo informacijos apie nuotolinio darbo galimybes ir pranašumus suteikimo neįgaliesiems ir darbdaviams bei nuo jų motyvacijos praktikuoti būtent šį darbo būdą. Nuotolinį darbą galima rekomenduoti skirtingo darbingumo lygio neįgaliesiems.

Pagrindiniai žodžiai: neįgalieji, nuotolinis darbas, darbo kokybė, informacinės technologijos.

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