

Older Workers and the Supply and Demand for Digital Technology Jobs

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Abstract — The article substantiates scientific views about the status of older workers with regard to their supply and demand in the labour market in the context of job digitalization. It justifies the reasons why this group of personnel should be included in the structure of human resources. Also, it describes components of professional competitiveness, provides a classification of knowledge and skills; presents the elements of digitalization that are characteristic of the modern workplace, and shows that older workers are willing and able to continue their employment in organizations. The paper provides an example of the motivational and demotivational components of using digital technologies by older workers in the workplace and in private life.

Keywords — Older workers, workplace digitalization.

I. INTRODUCTION

Thomas Kuhn was one of the first to introduce the concept of “paradigm shift” in his work “The Structure of Scientific Revolutions”. This term refers to a situation when the understanding of some concepts in the scientific world changes completely, i.e., new paradigms replace the old ones [1].

This new understanding is a result of individual thinking, an idea generated by a particular person as a reaction to changing reality. The understanding of reality determines its content, whose structure of which consists of a number of elements. Some of these elements are recognized as the highest priority (dominant), i.e., they are considered as the most important within a particular study. Other elements are deemed to be insignificant, they are ignored in research and rejected as “annoying exceptions” [2]. The consequences of ignoring or excluding ideas can be different for natural and management sciences [2]. In management, it is very important to have the right understanding of reality since the subject of research often changes and ignoring these changes can result in wrong decisions taken by practitioners, who are guided by the existing theories.

II. OLDER WORKERS IN THE RANKING OF LABOUR DEMAND IN THE LABOUR MARKET

For a long time, the state of the labour market did not give any reasons to revise the understanding of its real

characteristics. In many developed countries, the labour market was considered as being prosperous due to a low rate of ageing of the population. The mechanical movement of employable citizens did not pose any risks. The motto “live to work” was still relevant. There was no big difference in values and, consequently, there were no imbalances in career choices or the linkage to the employer, there was also no priority of private life over work.

This meant that older workers were perceived as those who had been honoured and respected, those who were moving into the phase of the life cycle, which implied doing hobbies, communicating with grandchildren, taking care of their health, and living in peace and quiet. Regarding work, traditionally the focus of the final labour phase was on preserving knowledge and experience, gradual transfer of tasks, power, and responsibilities, targeted transfer of competencies, avoidance of stressful situations, and courageously preparing to leave the workplace and a good impression of themselves.

The situation has changed. The development of demographic processes in highly developed countries did not contribute to the influx of workers in the labour market. The migration flows have become more intense at the expense of donor countries. There was an increased devaluation of the prestige of both trade and engineering jobs because of the small number of specialists in production, it was difficult to choose candidates for managerial positions. For younger people, work and private life have become of equal importance, they protest inwardly against subordination, and do not want to be linked to just one employer.

In the new reality, which is gradually being accepted as a “new normal”, the role of older workers has changed: their segment has started to objectively be viewed as a resource.

III. OLDER WORKERS AND THE LABOUR SUPPLY IN THE LABOUR MARKET

The rate of competition within the organization acts as a catalyst for the development of the employees’ characteristics enabling them to solve operational and strategic tasks. They include stable value, rarity, imitation complexity, and indispensability.

Obtaining these components of successful employment is associated with the development of competencies, which consist of knowledge and skills. Knowledge comes from constant improvement through training and advanced qualifications, the ability to comprehend and understand the content of tasks, the logic of their solutions, theory, principles, and factors.

Work skills can be both practical and cognitive. Practical skills include achieving mastery, choosing reasoned optimal methods, approaches, and technologies, using tools, materials, and currently relevant communication platforms and services.

The list of cognitive skills includes: intellectual abilities of the employee, which can be classified into two levels, basic and higher level skills. The level of basic skills is determined by short-term and long-term memory; the ability to perceive information processed by the brain, collected by the organs of vision, smell, taste, touch, and hearing. It also includes the ability to operate the system of vocal and graphic signs (language), which facilitate communication processes; to understand and generate ideas as a result of observation. Basic skills include the ability to set thinking on the right track to produce a certain action.

Higher cognitive skills mean the ability to be aware of one's own thoughts; to formulate conclusions based on the perception and understanding; to express one's emotions, to present the result of the work in the form of outside-the-box solutions of tasks. This group also includes skills of planning, forecasting, reorganization, and self-judgement.

The availability of competencies and the eagerness to start solving a professional task and to effectively complete it determine the *readiness* of the employee to perform work. Due to the peculiarities of the production and personal circumstances, older workers are less likely to develop their skills than their younger colleagues. More often this happens when learning requires memory, speedy receiving and processing information, and/or mechanical memorization of instructions. Since they retire soon, they do not see career prospects and are not ready to gain new knowledge and skills. In some cases, the requirements for training work assignments do not correspond to real tasks. As a result, some of the hard-earned competencies are redundant or not in demand in the workplace. There are also problems connected with the poor adaptation of teaching techniques for older workers.

Eagerness as an element of readiness for work is characterized by the ability to consciously strive to achieve the result set by the manager. Eagerness to complete a task can be viewed from two sides. On the one hand, long-term employment in the organization contributes to the fact that the employees become insiders, and they feel that the organization is a part of their identity. On the other hand, a focus on younger people and determining older employees as a problematic group reduces the eagerness to work effectively and results in a desire to quit.

Aging populations are a global trend that result in a shrinking workforce and present a financial challenge for pension schemes. Politicians and scientists justify the need to respond to these changes by extending the working life [3]. It has been suggested that to preserve the competitiveness of older workers it is necessary to improve their knowledge and

skills. However, this proposal has come into conflict with the new workplace requirements associated with digitalization.

“Digitalization” means creating a work environment characterized by increased use of electronic tools, automated systems, and technological devices and resources that generate, process or store information in the form of a binary code [4]. Digital technologies can have the following effects on the modern workplace:

- Intensive use of computers that changes work tasks and the way they are performed.
- Transformation of work tasks and providing employees with new tools to solve them (for example, computers or the Internet) [5], [6], [7].
- Replacing workers with robots and artificial intelligence in routine tasks and hazardous tasks, which can be automated [8].
- Creating new workplaces, in particular, in the field of information and communication technologies [9].
- Expansion of opportunities for remote work.

Currently, there are not enough representative studies dedicated to older workers in the field of digitalization to draw any valid conclusions [10]. However, there are expert opinions about significant differences in the use of new technologies by representatives of different age groups. Unlike young people (for example, Table 1) [11], older staff have weaker skills, which makes it more difficult to use them at the workplace. Comparatively low digital skills in the workplace can make the skills of older workers obsolete, reduce their employment opportunities, and lead to their earlier retirement than required by the country's economy. This trend undermines the attempts to extend working life [12], [13].

Table 1

Regularity of using communication services by university students, percent

	Several times a day
WhatsApp	88.7
Facebook	41.7
Instagram	25.4
Snapchat	16.4
Google+	2.7
Skype	1.8
Twitter	2.1
Jodel	10.1
Tumblr	0.8
Pinterest	1.7
Xing	0.7
LinkedIn	0.6

In addition to the readiness of older employees to continue their employment, their ability to perform the assigned tasks is taken into account. Despite the fact that there is no linear relationship between working capacity and age, and crystallized intelligence remains at least unchanged or even increases slightly over the years, fluid intelligence tends to decrease. This means that the accumulated knowledge and skills remain forever, however, the ability to solve new logical and analytical problems, to think outside the box is only preserved till the age of 30-40.

Therefore, the model of functional ages focuses not on the return of the components of working capacity that have

become scarce with age, but on the individual skills and abilities of the employee, which will ensure their labour effectiveness. Thus, the rate of receiving and processing information, short-term (operational) memory, functioning of the senses, mobility of the musculoskeletal system become scarce with age. However, the focus on achievements, systematic thinking, the ability to make decisions, endurance, expert competencies, diligence, and wisdom based on life experience do not change.

We agree with the opinion that the reduced working capacity of older employees is due to discrepancies between individual ability to work and objective requirements for its implementation. Therefore, we consider it important to take into account individual factors when assigning tasks. The factors may include the peculiarities of the employee's physical and mental state, a "sandwich situation", i.e., the need to care for elderly parents and grandchildren at the same time.

Table 2

Motivational and demotivational components of using digital technologies by older workers in the workplace and in private life (example)

The impact of digital technology on work and private life		
Transformation	Substitution	Creation
<p>- Digital technologies have the potential to support older workers, can reduce physical stress in the workplace and help them take care of their health, which is important when there is reduced physical employability due to reduced muscle strength and symptoms of wear and tear on the spine. An example is the replacement of bulky and heavy paper folders [14] with reports, instructions, and programmes with recorded information on memory sticks.</p> <p>- Older employees experience high</p>	<p>- Using computers, robotics, virtual reality technologies to perform routine work.</p> <p>- Digital technologies used in private life allow accumulating experience that older workers transfer to their workplaces [16].</p> <p>- Remote employment blurs the lines between work and personal life making it difficult for workers to switch off work-related stress [17].</p> <p>- Increased risk of stress-related diseases.</p>	<p>- Creating remote workplaces, especially in the information and communication technology sector.</p> <p>- The ability to remotely monitor the employee's health (for example, train drivers).</p> <p>- Reduced barriers associated with the need to combine work and caring for sick or elderly relatives. In this situation, the employee that has to be present at the workplace is forced to retire early [18].</p> <p>- Facilitating home-office employment. This can help older workers better coordinate their work and caregiving</p>

levels of anxiety and stress when using digital technologies [15].

responsibilities at home, which reduces work-family conflicts. However, there is also the reverse side of the coin: performing both activities at home can interfere with both, which can result in a conflict situation. [15].

- Digital technologies can facilitate communications over geographical distances, for example, using teleconferencing software [19].

- Digital technologies ensure the well-being of older workers due to the possibility of transnational communication with relatives, children, and grandchildren, as well as colleagues in international or remote companies.

- They provide an opportunity for "intermediate" employment, i.e., additional work.

- They increase the possibility to participate in professional work after retirement (Kohli) [20].

- They allow escaping social isolation that causes depression and melancholy.

- Possibility to fill the need for the feeling of involvement (with colleagues).

- New

	opportunities for communication by means of mobile applications. - Development of the database of older employees' knowledge, to which, with their consent, access can be granted in most countries of the world.
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