DOI: https://doi.org/10.30525/978-9934-26-352-1-6

ЛЮДСЬКИЙ КАПІТАЛ ЯК ЗАПОРУКА ДИФУЗІЇ ІННОВАЦІЙ В УМОВАХ ДІДЖИТАЛІЗАЦІЇ ЕКОНОМІКИ

HUMAN CAPITAL AS A CONTROL OF DIFFUSION OF INNOVATION IN THE MINDS OF THE DIGITAL ECONOMY

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The leading trend of the current stage of economic development is the concept of "Industry 4.0", according to which society is entering a new era, which is the era of the Fourth Industrial Revolution. According to the definition of Klaus Schwab, who introduced this term, the latest stage of industrial development will be associated with the widespread use of robotics, nanotechnology and artificial intelligence, which involves direct machine-to-machine communication and the Internet of Things, when the interaction between devices takes place in a digital format without direct human involvement. In this sense, the Third Industrial Revolution, which is defined as the transition to the use of digital technologies, created the conditions for the digitalization of society in general and the economy in particular. In turn, digitalization provided the opportunity to transition from the era of industrial development and analog information processing to the Knowledge Economy or SMATR Economy, which involves the wide implementation of innovative technologies with the use of cognitive computing. So, digitalization is not a goal, but a tool of optimizing business processes and has a systemic nature. In this regard, in Ukraine, the digitalization process is of crucial importance for ensuring the efficiency of the national economy.

The purpose of this work is to analyze the modern requirements that human capital must meet in order to successfully implement the concept of "Industry 4.0" as a marketing strategy.

The development of the Fourth Industrial Revolution, like all previous ones, is, in fact, the diffusion of innovative technologies in all areas of production, which leads to a rapid increase in industrial efficiency and optimization of the use of the planet's resources. However, this is accompanied by significant changes in the requirements for most professions, the creation of new jobs, and some professions disappear altogether. Therefore, the diffusion of innovations is influenced not only by competition in the innovation market, but also by government control aimed at regulating this process at the macro level. In this regard, one of the tasks facing the state is to measure the level of digitization in all spheres of society. The most common is the use of the Digitization Index, according to which the McKinsey Global Institute examines the impact of digitalization on the level of economic development of various countries [1]. This Index provides an analysis of the company or the country based on 27 indicators, which are combined into three groups: digital assets, the use of digital technologies in the company's interaction with customers and suppliers, and the digital skills of employees, that is, the digitalization of human capital. And the last two categories are crucial. According to this indicator, a comparison of digital competitiveness at the country level was made for 63 countries. It turned out that as of 2022, this indicator is the highest for Denmark. If we take this result as 100%, then the USA and Sweden are in second place with an indicator of 99.81%, and Singapore is in third place with an indicator of 99.48%. By the way, Denmark now has the best indicators in terms of the level of "digital talents" and the quality of the organization of their training.

The Digitization Index allows you to measure digital progress in each industry, which is why it was taken into account when building the McKinsey 7S Model, which was proposed by Tom Peters and Robert Waterman in 1980. It is advisable to use this model under strategic plans construction for the development of an enterprise of any industry to assess the state of its microenvironment, readiness for innovative changes and, accordingly, for increasing its competitiveness [2]. The McKinsey 7S Model provides for the definition of 7 indicators (Skills), which are combined into two groups: Hard Skills, i.e. indicators that are amenable to quantitative assessment, and Soft Skills, for which it is possible to carry out only a qualitative assessment using fuzzy logic, and all indicators of this model are considered dependent on each other (Figure 1). It should be noted that the Skill indicator assesses the ability of employees to use digital technologies in their professional activities, and

when determining the Staff indicator, the number of IT specialists in the company is taken into account.

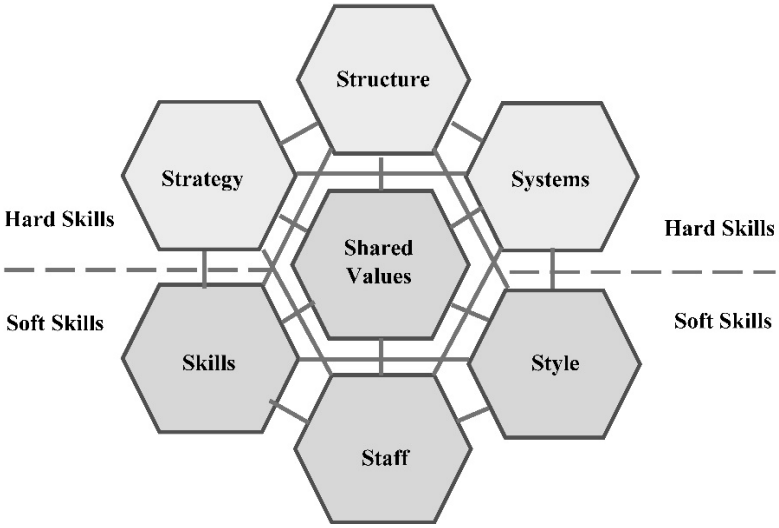

Figure 1. The McKinsey 7S Model as a system of Hard and Soft Skills indicators

Source: [2]

Another recognized indicator that determines the level of digitization is the Digital Economy and Society Index (DESI), which is used in the countries of the European Union [3]. The development of this index is due to the fact that digitalization is considered a priority direction of development in the EU countries. Thus, 127 billion euros have been allocated for reforms aimed at supporting digital transformation. And such states as Austria, Ireland, Lithuania, Luxembourg and Germany spend more than 30% of the funds of the Recovery and Resilience Fund on the development of digital technologies. According to the results of 2020, the first three steps in the DESI rating were occupied by Denmark, Sweden and Luxembourg.

Under calculating the DESI index, the evaluation is carried out according to the following five categories:

1. Connectivity – Fixed broadband take-up, fixed broadband coverage, mobile broadband and their prices.
2. Human capital – Internet user skills and advanced skills.

3. Use of internet – Citizens' use of internet services and online transactions.

4. Integration of digital technology – Business digitalization and e-commerce.

5. Digital public services – e-Government.

Digital skills of staff and the society at whole are the foundation of a digital economy, so the "human capital" category assesses precisely these skills. Within DESI, this category has two subcategories, which cover "internet user skills" and "advanced skills and development". The first sub-category uses the results of the European Commission's digital skills assessment based on the complexity of activities related to the use of digital devices and the Internet. The second subcategory includes indicators on the number of ICT specialists and ICT graduates. Undoubtedly, all components of DESI are important for ensuring digitalization of the economy, but all of them are realized through the human, through human capital. By the way, Lithuania, which took fourth place in the DESI rating, showed the best result for the quality of digitalization of human capital. Digital skills allow people to work effectively even in conditions of limited mobility, which ensures the functioning of the sphere of social security and business. Currently, on average in the EU countries, about 60% of the adult population have at least basic Internet skills and 35% of the population have above basic Internet skills. The number of ICT specialists working in EU countries is increasing. In 2018, about 9.1 million people worked in this field. The highest number was reported in the UK and Germany (both 1.6 million), followed by France (1.1 million). However, there is still a shortage of such specialists. Among large enterprises, 64% reported that they were unable to fill vacancies in 2018. Among small and medium-sized enterprises, this share is 56%. Such a problem is especially acute for enterprises in Romania and the Czech Republic. There, this share reaches 80%.

The "human capital" component of DESI is strongly influenced by socio-demographic aspects. For example, 82% of young people (aged 16–24), 85% of people with higher formal education and 87% of students have at least basic digital skills. In contrast, only 35% of people aged 55–74 and 30% of pensioners and the unemployed have basic skills. There is also a gender issue. Only 6% of ICT specialists were female.

In the modern realities in which Ukraine finds itself, the spread of digitalization to the objects of the economy and the introduction of such innovative technologies that will not require direct human participation in the production process are of great importance for ensuring the capacity of our country's economy and restoring its industrial potential. In this regard, the Cabinet of Ministers of Ukraine approved the list of indicators for determining

the DESI index in our country, as well as the procedure for collecting and processing data for its calculation according to the EU methodology. This will help Ukraine to realize the potential of digital competitiveness and in the future to form a SMART economy model. The use of advanced digital technologies, such as artificial intelligence, the Internet of Things, cloud computing and big data analysis, opens up new opportunities for the diffusion of innovations and, accordingly, creates conditions for the recovery of all sectors of the economy.

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