

UDC 331

DIGITAL TECHNOLOGIES ON LABOUR MARKET

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The article deals with the general trends of replacing people with information systems. It is noted that the professions of the average wage and the average level of complexity are exposed to replacement in a greater extent. Examples of future professions from the sphere of management and the general characteristic of competences necessary for successful work in the future are described in the work.

Introduction. Technological development has always destroyed some professions, replacing them with new ones with other activities, perhaps in every sphere. For example agriculture in the United States at the beginning of the XIX century: people employed in this area accounted for 90% of the workforce, today their market share does not exceed 2%. And such a sharp decline occurred relatively smoothly, without big social unrest or total unemployment. The app development economy is another example of a new employment ecosystem. Many categories of professions, in particular those connected with mechanical monotonous work, are already automated. They will be followed by other categories as computing power continues to grow exponentially [4]. In this regard, it will be relevant to study the causes and consequences of the transformation of labor market under the influence of inexorably ongoing technological progress. The purpose of this research is to study the current trends in the labor market and analyze the factors that will affect the formation of professions in the field of management in the near future.

Main part. As noted by Schwab (2016), employment will grow in high-income cognitive and creative professions and in low-income manual work, but it will significantly decrease in the average income monotonous standard professions [4]. In support of this thesis, we can cite the "curve of the Autor", which is shown in figure 1.

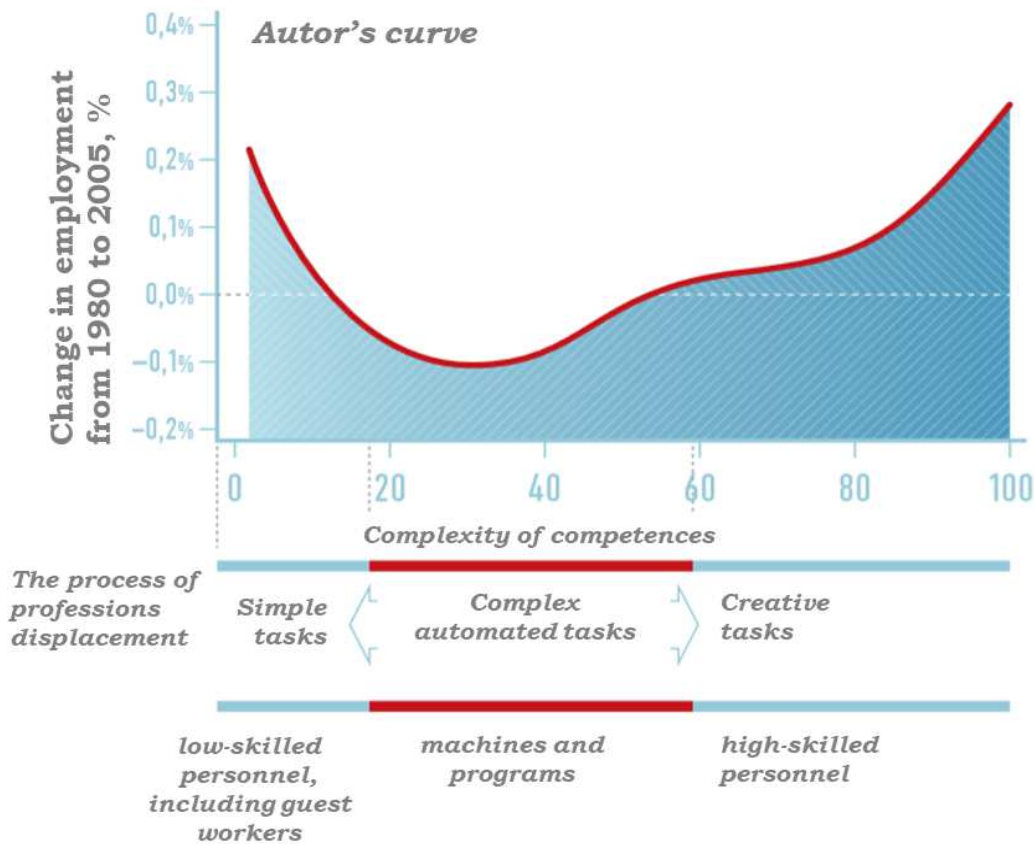


Figure 1. – Autor's Curve

Source: [3].

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The "Autor's curve" is a curve developed by the American economist David Autor, which shows the change in employment in the US industries from 1980 to 2005, depending on the qualification of workers. The graph shows that employment among low- and high-skilled workers has been growing and employment among middle-skilled workers has been declining. This was primarily caused by widespread use of automated solutions for tasks of medium complexity. Automation in industries always begins with the work of the average level of qualification. These works contain enough template components to be easily automated, and are already well paid to make automation economically attractive for business owners [3].

It is interesting to note that the replacement of people with automated systems is connected not only with the expanding capabilities of algorithms, robots and other assets other than the workforce. According to Michael Osborne, a fundamentally important factor that provides automation is the fact that in recent years companies have invested a lot of effort and money in a more accurate definition and optimization of jobs in the framework of activities in order to transfer works to third parties, to provide their withdrawal from the country or to transform the job into remote status (for example, through the service Mechanical Turk of Amazon – the collective market of crowdsourcing on the Internet). Such optimization of workplaces means providing additional opportunities for replacing people with algorithms, since discrete, exactly defined tasks entail more effective monitoring and high quality of data related to the task, thus creating a convenient base on which it is possible to develop algorithms for the performance of work [4].

There is also a negative side of the medal of mass development of information technologies: mass robotics and automation will lead to the release of jobs, a large number of people may be left without work, it will be necessary to retrain specialists to other professions, but also there will be a lot of new professions. This in turn is a source of economic and social tension for modern society. From the Technology at Work report, published by Oxford Martin School, it may be predicted that 77% of jobs in China will be robotic in the next couple of decades, in India the same value will be 69%, Thailand – 72%, the US – 47%, the UK – 35% and the average for OECD countries – 57% [1].

In research made by Frey and Osborne the quantitative values of the potential impact of technological innovations on unemployment are given, where 702 professions are distributed according to the degree of probability of their automation: from the minimum risk of automation ("0" corresponds to the absence of risk) to the most risky ("1" maximum risk of replacing the profession) [2].

Table 1 shows examples of professions that are subject of automation.

Table 1. – Examples of professions subject to automation

<i>Most exposed to automation</i>	
Probability	Profession
0,99	Telephone sales specialists
0,99	Tax documentation specialists
0,98	Insurance appraisers, auto damage
0,98	Referees, arbitrators, other officials in the sports industry
0,98	Legal secretaries
0,97	Waiters and hostesses
0,97	Real estate agents
0,97	Contractors in the agricultural industry
0,96	Secretaries, administrative assistants, except for legal and medical assistance
0,94	Couriers and messengers
<i>Minimal exposure to automation</i>	
0,0040	Choreographers
0,0042	Physicians and surgeons
0,0043	Psychologists
0,0055	Human resources managers
0,0065	Computer systems analysts
0,0077	Anthropologists and archaeologists
0,0100	Marine engineers and naval architects
0,0130	Sales managers
0,0150	General directors

Source: compiled by the author on the basis of [2].

In general, there are can be distinguished three groups of professions [3]:

- new professions - appear in connection with the change of technologies, the use of new practices and new demands of consumers;
- changing professions - changing under the influence of information and communication and other technologies;
- professions pensioners - disappear as a result of automation and other technological and social changes.

It should be noted that there are at least four categories of knowledge that robots can hardly master. All such professions may be characterized by unpredictability, and they are [5]:

- working with unpredictable people (i.e. people in general);
- work in an unfamiliar environment;
- working in complex and changing situations;
- work in terms of dual processing of the data.

Accordingly, the most important factor of professional development at the present time is that the profession is not static, the possession of its graduate does not mean achieving complete success. Traditional definitions of skilled work are based on the availability of advanced or specialized education and the acquisition of certain skills within a profession. The most competitive employees are those who "absorb" the so-called over-professional skills. They include [3]:

- systems thinking;
- intercultural communication;
- ability to manage projects, use project approach in solving professional tasks;
- culture of "lean" wasteful production and skills of optimal (with minimal resources) solution of the problem;
- ability to work with robotics and artificial intelligence systems;
- ability to work with customer focus;
- multilingualism and multiculturalism;
- skills of working with people and integration of the employee into work with numerous social groups;
- skills of working in conditions of high uncertainty (due to changes in the environment);
- creativity.

If we turn to a specific area of management, we can say the following. If earlier management systems looked like pyramids with many levels of middle management, now pyramids become "flat", workers are more delegated, freedom of decision-making increases. For example, some companies experiment with working without bosses at all. The main tasks of management in the future will be to find mechanisms of distributed management: opportunities to form, coordinate and evaluate distributed mobile teams of specialists for specific projects. In the 2020s, the role of non-hierarchical organizations (for example, the community of independent producers) will increase, they will coordinate their sales, production, investment in equipment and human capital through the network [3].

In table 2 we consider what professions in management may appear and how they will look like.

Table 2 – New professions in the field of management

Profession	What the employee will do
1	2
Time-broker	A specialist who "sells" the working time of specialists, who are in free employment, that means managing someone else's employment on the open market. This specialty on the far horizon disappears due to the appearance of automated solutions
The production coordinator in distributed communities	A professional who consolidates the customer orders and organizes the work of independent teams working within the industry community in order to develop, manufacture and assemble the product according to the customer's requirements. In fact, it is the director of production for the community, consisting of several independent producers
Trendwatcher/forsiter	Specialist who monitors the emergence of new trends in different sectors of the economy, public life, politics and culture, making reports on the impact of new trends on customer needs. On the far horizon, the ability to work with images of the future will become a universal competence of any managers
Virtual lawyer	Specialist in remote legal support through the network, including the norms of the legislation of the country in which the case should be conducted (regardless of the country in which the lawyer practices himself)

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Continued Table 1

1	2
Portfolio manager of corporate venture funds	A specialist who manages the company's investments in startups created on the basis of the ideas of its employees and aimed at the development of the company's product line. Accompanies the development of these startups from idea to production
Corporate anthropologist	It is the specialist responsible for studying the markets of innovative products of the company by anthropological methods (for example, the included supervision) and increasing the relationship of the company with its target audience

Source: compiled by the author on the basis of [3].

These are just some examples of possible professions in the field of management. At the same time, we note that the emergence of a new or change in the old profession occurs gradually: firstly, a small number of pioneers try a new approach to the performance of work, then the bulk of employers recognize the need for changes, and the "tail" can last for a very long time.

Conclusion. As a result of our research we can identify some trends. Firstly, the replacement of people's functions by information systems occurs to a greater extent at the average level of any sphere of activity, when the task is not very difficult, but already quite well paid. Secondly, the replacement of people with computers is impossible when working with unpredictable people, in an unfamiliar environment, in complex and changing situations, in conditions of dual data. And thirdly, the emergence of new professions and the change of old ones will require from workers to acquire over-professional skills, such as systems thinking, intercultural communication, skills to work in conditions of high uncertainty, etc.

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