

SKILLS TRENDS IN THE LABOR MARKET IN THE CONTEXT OF THE CHANGING WORK PARADIGM AND DIGITAL TRANSFORMATIONS

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Abstract

This scientific endeavour addresses skills in the labour market in the context of the changing work paradigm and digital transformations. In recent years, significant changes have taken place in technological processes, which directly influence the content of work and the skills required of the workforce. Currently, in order for the workforce to be competitive in the labour market, it must develop in a multifaceted way, by acquiring both digital and soft skills. The accelerated development of digital technologies has led to the emergence of new skills specific to this field, which will be in greater demand in the labour market. In this context, there is a reconfiguration of the soft skills that employees must demonstrate in the workplace.

Methodologically, the evolutionary analysis of skills in the labour market is based on reports from the World Economic Forum, which examines the evolution of jobs and future skills globally at five-year intervals. The findings show a change in the content of skills in the labour market as artificial intelligence systems and robots are implemented in the workplace. In the future, digital skills will be necessary in virtually all fields of activity, while soft skills are being reshaped to fit the new economic and social realities.

Key words: skill, digital skills, soft skills, artificial intelligence, labour market, workforce.

JEL Classification: J24; J44; L25; M53.

1. Introduction

The skills required in the labour market are directly influenced by changes in the work content. In turn, the work content is influenced by technological developments that require new knowledge and abilities among employees to cope with new technological and contextual challenges. In this context, Manyika (2017) notes that in a world increasingly based on technology, smart devices, quantum computing, and autonomous vehicles, significant changes are taking place that challenge long-held assumptions about the content of work and the roles that people will play in the future of workforce. Current technological trends are driving significant changes in the core curriculum of many academic fields, as nearly 50% of the knowledge acquired in the first year of a four-year technical degree is outdated by the time students graduate. Beyond technical/hard skills and formal qualifications, employers are equally concerned with the practical job-related competencies that current (or potential) employees can use to successfully perform various work tasks (WEF, 2016). Likewise, Rotatori et al. (2021) found that, over the past two decades, the literature on skills training has emphasized the importance of developing skills in science, technology, engineering, and mathematics (STEM) to develop the workforce of the future. Furthermore, Acemoglu & Autor (2011) researched the increasing skill returns, as a product of the complementarity between technology and a highly skilled workforce. Over certain periods of time, researchers have analysed different skills that are considered important in the labour market. Thus, Deming (2017) analysed the importance of social skills in the labour market. Having in mind the fast pace of change in skill content, Li (2024) suggests that lifelong learning should be part of an organization's strategic goals. In the author's opinion, both individuals and organizations have to engage in reskilling and upskilling and make career development an essential stage of the future workforce.

People who are competent at work are those who meet the performance level expected by the organization and are able to apply their knowledge, skills, and personal attributes to achieve the

goals and standards specified for their jobs (Bîrcă, 2022; Bîrcă & Matveiciuc, 2025), thus becoming competitive in the labour market.

The globalization continues to be a significant factor of change in terms of both job content and workforce skill requirements (Manyika 2017). In the context of increased competition for talent with the skills needed for the 21st century, Moore & Morton (2017) argue that employers are more concerned with expanding the capabilities of their employees. The changes taking place in society have led Rotatori et al. (2021) to assert that globalization, increased automation of business processes, and the deployment of cognitive technologies in the workplace have transformed the nature and content of work. In addition, automation driven by technological developments could have a significant impact on the size, structure, and characteristics of the labour market in the future. At the same time, the key parameters of workers' competitiveness in the labour market will be linked to interdisciplinary skills and creativity, rather than specialization. In terms of form, it is expected that lifetime jobs with a fixed-term contract and a well-defined work schedule will increasingly be replaced by flexible working arrangements (Jandrić & Ranđelović, 2018).

Over time, the evolution of skills in the European Union labour market, as well as the involvement of organizations in their development, has been a subject of research for several researchers (Birca, 2022). Likewise, skills in the labour market of the Republic of Moldova have been a subject of research in the context of the development of artificial intelligence systems (Bîrcă et al., 2025).

Based on the above, the purpose of this paper is to analyse changes in skills in the international labour market as a result of the development of artificial intelligence and automatic management systems. The paper contains several sections, including a conceptual approach to skills, the dimensions of skills in the labour market, the content of skills in the context of digitalization, and a dynamic analysis of the top skills according to the World Economic Forum.

2. The conceptual approach of competencies

According to Lawler et al. (1988), the employees' knowledge and skills that make up the professional competencies within the organization have become increasingly important for its performance, competitiveness, and innovation (Armstrong, 2011). Some authors believe that employees with a high level of professional competence have developed a greater innovative spirit, contributing to a greater extent to the achievement of organizational performance.

The competency-based approach to human resource development has been driven by several factors, some of which are considered global, while others are specific to the European context (Delamare Le Deist & Winterton, 2005).

Globalization and technology have also changed the way in which employees' skills are applied and valued (Bakhshi et al., 2019). Employees are increasingly valued for the knowledge they possess and for the way they can use it to produce tangible ideas (Bejinaru, 2016). In this sense, the concept of “knowledge workers” refers to professionals whose jobs are characterized by solving unusual problems, which mainly require intellectual work and creative thinking (Sokół & Figurska, 2017). The 21st century brings with it a new concept, namely that of “digital competence”. According to Van Laar et al. (2017) “digital competence” is a key concept in the discussion of the type of skills and understanding that citizens need to have in the knowledge society. Although the term encompasses “digital”, the authors argue that it is seen as a distinct competence, implying that 21st century skills are not necessarily supported by ICT. Digital competence covers information management, collaboration, communication and sharing, content and knowledge creation, ethics and responsibility, evaluation and problem solving, and technical operations (Ferrari, 2012).

3. Dimensions of competences on the labour market

WEF (2016) highlights three categories of work-related skills, namely: abilities, basic skills and cross-functional skills (Figure 1).

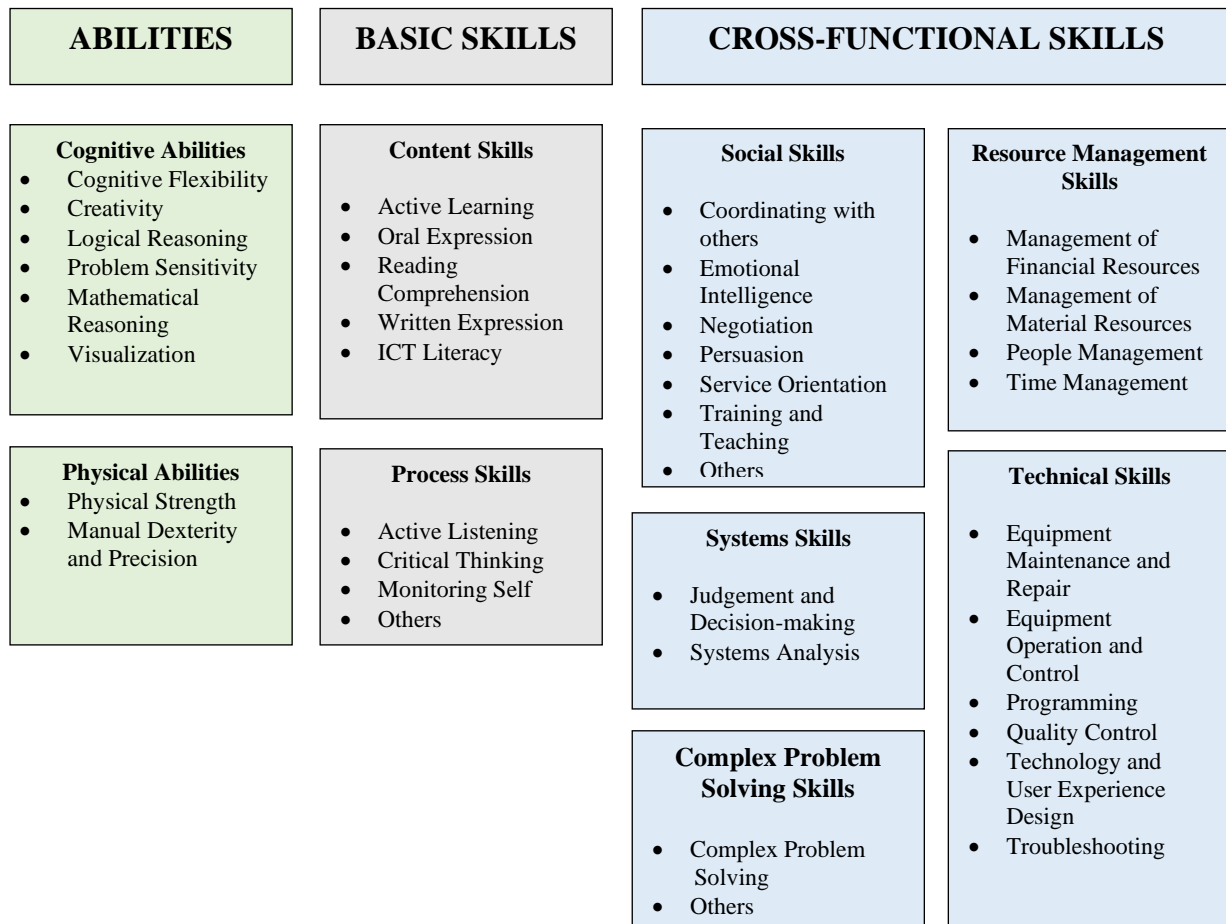


Figure 1. Core work-related skills

Source: (WEF, 2016)

If the first two categories (abilities and basic skills) are general for any job, the third category refers directly to the job.

Hart et al. (2021) propose a new taxonomy model for transversal skills and competences (TSC). Transversal skills primarily cover what are traditionally referred to as “non-technical skills”, which refer to the personal ability to interact with others, including effective teamwork, effective communication and problem solving (Belchior-Rocha et al., 2022). These are considered necessary or valuable for effective action in any professional or extra-professional activity. In a world facing rapid technological and social changes, this transversality and associated transferability is seen as increasingly important. The model consists of six main categories, namely: basic skills, thinking skills, self-management skills, social and communication skills, physical and manual skills, and life skills (Hart et al., 2021).

With the development of AI systems, core skills consist of improving employees' ability to understand, speak, read, and write in several languages, as well as developing their ability to use numbers and units of measurement, devices, and applications.

Thinking skills refer to the capability to apply mental processes of collecting, conceptualizing, analysing, summarizing, and/or evaluating information that is obtained or generated through observation, experience, reflection, reasoning, or communication. This is

expressed in the use of different types of information for: planning activities; achieving goals; addressing and solving problems; performing complex tasks, etc.

Self-management skills refer to a person's capability to understand and control their strengths and weaknesses, as well as to use self-awareness to guide their activities in a variety of contexts. This consists of a person's capability to act in a reflective, responsible, and structured manner in accordance with pre-established values, as well as to accept feedback and seek opportunities for personal and professional development (Hart et al., 2021).

Social and communication skills refer to a person's capability for positive and productive interaction with others. This can be achieved through effective and empathetic communication of ideas, aligning one's goals and actions with those of others, identifying solutions to disagreements, building trust and solving conflicts, as well as caring for the well-being and progress of others.

Physical and manual skills refer to an individual's capability to perform tasks and activities that require manual dexterity, agility, and/or physical strength. These tasks may be performed in difficult or hazardous environments that require endurance or physical strength, and may be performed either manually or with the use of equipment and technology (Morandini et al., 2023).

The last category - life skills - enable individuals to cope with the conditions and responsibilities of modern life. Compared to the other five categories, life skills reflect changing societies and will be, to some extent, more dynamic and subject to change (Hart et al., 2021). According to the authors, life skills refer to the ability to process and use knowledge and information that have a transversal significance and facilitate active citizenship. They cover aspects such as health, culture, finance and economy, science and technology, environment and civic engagement. Life skills enable individuals to manage knowledge and information and use it as a basis for forming opinions, making decisions regarding personal/professional progress and social responsibility.

For organizations, integrating employee development policies should be part of an organization-wide business strategy (Gardiner et al., 2001), and represent a way to influence the level of 21st century skills (Koehorst et al., 2021). Doing so can optimize the development of 21st century skills among knowledge workers, which gives organizations a competitive advantage in an era where knowledge and what employees can do with that knowledge are considered a valuable asset (Sokół & Figurska, 2017).

At the same time, the Partnership for the 21st Century (2008) lists three types of competences:

- learning skills - creativity and innovation, critical thinking and problem solving, communication and collaboration;
- literacy skills - information, media and ICT competences;
- life skills - flexibility and adaptability, initiative and self-direction, social and intercultural competences, productivity and responsibility, leadership and accountability.

4. The content of competences in the digitalization process of society

In the context of the development of AI systems, Huang & Rust (2018) developed the theory of job substitution by artificial intelligence. The authors highlight the significant impact of artificial intelligence (AI) on the labour market, focusing in particular on how AI can substitute human tasks in the service sector. The theory states that the replacement of human labour by AI occurs mainly at the task level, especially simple mechanical tasks. At the same time, Van Laar et al. (2017) examined the relationship between 21st century skills and digital skills and provided a framework of 21st century digital skills, with conceptual dimensions and key operational components, for the knowledge worker.

In addition, Li (2022) argues that organizations need to focus their efforts on developing the professional skills of their employees, based on seven disruptive technologies that have been clearly on the rise in recent years, namely: Artificial intelligence; Quantum computing; 5G and 6G

networks; IoT (Internet of Things) and IIoT (Industrial Internet of Things) networks; Data Sciences & Business Intelligence; Cybersecurity; Green energy. In this context, the importance of digital skills is widely recognized in the context of developing adequate skill sets of employees. However, Poláková et al. (2023) consider it imperative to emphasize the relevance of human skills, as they remain non-substitutable by robots. In addition, the labour market recognizes and rewards these skills due to their ability to confer flexibility and adaptability. In the authors' opinion, emotional intelligence, resilience, empathy, creativity and critical thinking are perceived as crucial skills for cultivating a productive and competent workforce, ready to meet future demands.

Beyond this, Poláková et al. (2023) argue for the need to develop non-technical skills in the context of the development of artificial intelligence because humans excel in areas such as interpersonal interactions, intuition, and complex decision-making. Although humans and machines can arrive at the same answer, the thought processes used to reach a conclusion are different. Tasks that require contextual understanding, situational awareness, and interpretation related to culture, history, and social norms are where humans are superior to machines (Zhanna & Natalia, 2020). Interpreting machine-generated responses, presented as probabilities in terms of quality, correctness, magnitude or significance, requires human judgment. Such contextual interpretation is intrinsic to non-technical skills, which involve a level of thinking and contextual understanding that machines are unable (Pölönen, 2021). Thus, Poláková et al. (2023), based on bibliographic analysis, identified 16 categories of non-technical skills specific to Industry 5.0, namely: *Problem-solving skills, Communication skills, Organizational/managerial skills, Teamwork, Leadership skills, Creativity, Analytical and critical thinking, Values orientation, Flexibility, Initiative and involvement, Learning skills, Well-being orientation, Taking responsibility, Emotional intelligence and Perseverance*. In contrast to Poláková et al. (2023), Marr (2022) highlights 20 skills needed for the future of work, referring to both technical and non-technical skills.

The rapid pace of technological progress is linked to significant investments in talent development, emphasizing the upskilling and reskilling of the workforce and the importance of continuous learning to meet these new challenges (Gamberini & Pluchino, 2024).

5. Analysis of top skills in the labour market

The rapid change in work equipment, and the expansion of the implementation of AI systems in the work environment have led to a change in the importance and significance of employee skills. In this context, Horváthová et al. (2022) argue that the rapidly changing labour market, with multiple challenges such as digitalization and its implications for the future of work, technological changes, the environment, aging societies and social inclusion, requires a solid base of skills and the constant renewal and acquisition of new skills, knowledge and abilities.

In the last 15-20 years, the structure of the demand for skills in the labour market has changed significantly, being influenced, for the most part, by technological changes, including the digitalization and robotization of several processes. Next, we will present the ranking of the top 10 skills in demand in the labour market in 2015, 2020, 2025 and 2030, results of research conducted by the World Economic Forum every 5 years to anticipate skills needs in the labour market. Thus, Figure 1 presents the top 10 skills for 2015 and 2020, as well as the changes in the ranking during this time interval.

2015		2020
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Complex Problem Solving	↔	Complex Problem Solving
Coordinating with Others		Critical Thinking
People Management		Creativity
Critical Thinking		People Management
Negotiation		Coordinating with Others
Quality Control		Emotional Intelligence
Service Orientation		Judgement and Decision Making
Judgement and Decision Making		Service Orientation
Active Listening		Negotiation
Creativity		Cognitive Flexibility

Figure 1. Comparative analysis of top skills on the labour market in 2015 and 2020

Source: Developed by author according to Gray, A. (2016).

From Figure 1, we see that Complex Problem Solving ranked first in the top 10 skills on the job market, being considered the most important for employers. We also see that some skills – *Coordinating with Others*, *People Management*, *Negotiation* and *Service Orientation*, which were in the top 10 in 2015, lost some positions in 2020. At the same time, *Critical Thinking*, and *Creativity* gained more positions in 2020 compared to 2015. In addition, *Quality Control* and *Active Listening*, which were in the top 10 in 2015, are no longer found in 2020. At the same time, two other new skills appear in the top 10 in 2020, namely *Emotional Intelligence* and *Cognitive Flexibility*. Unlike the previous analysis (2015 vs 2020), in 2025 the ranking of the top 10 skills changes to a much greater extent (Figure 2).

2020		2025
Complex Problem Solving	↔	Analytical thinking and innovation
Critical Thinking		Active learning and learning strategies.
Creativity		Complex Problem Solving
People Management		Critical thinking and analysis
Coordinating with Others		Creativity, originality and initiative
Emotional Intelligence		Leadership and social influence
Judgement and Decision Making		Using, monitoring and controlling of technology
Service Orientation		Technological design and programming
Negotiation		Resilience, stress tolerance and flexibility
Cognitive Flexibility		Judgement, decision making

Figure 2. Comparative analysis of top skills on the labour market in 2020 and 2025

Source: Developed by Gray, A. (2016) & World Economic Forum (2020).

From Figure 2 we see that the skills placed in the first 3 positions in the top 10 in 2020 lost several positions in 2025. Similarly, four skills in the top 10 in 2020 (*People Management*, *Emotional Intelligence*, *Service Orientation* and *Negotiation*) were not a priority for employers in 2025. The rapid evolution of technologies led to the emergence of four other new skills in 2025, namely: *Analytical thinking and innovation*, *Active learning and learning strategies*, *Use, monitoring and control of technology* and *Technological design and programming*. Of the four new skills that appeared in the top 10 for 2025, two occupy the first two positions. For 2030, a greater demand for digital skills is anticipated, as a result of the technological transformations we are currently witnessing. The information presented in Figure 3 highlights the leap that several skills in the top 10 made in 2025.

2025		2030
Analytical thinking and innovation		AI and Big Data
Active learning and learning strategies		Networks and Cybersecurity
Complex Problem Solving		Technological literacy
Critical thinking and analysis		Creative thinking
Creativity, originality and initiative		Resilience, flexibility and agility
Leadership social initiative		Curiosity and lifelong learning
Using, monitoring and controlling of technology		Leadership and social influence
Technological design and programming		Talent management
Resilience, stress tolerance and flexibility		Analytical thinking
Judgement, decision making		Environmental stewardship

Figure 3. Comparative analysis of top skills on the labour market in 2025 and 2030

Source: Developed by author according to World Economic Forum (2020) & (2025).

From Figure 3 we see that the first three skills in the top 10 skills ranking for 2030 are digital. Compared to 2025, there is an increased demand from employers for these skills. The transformation of operational processes through robotization and AI leads to an increase in their relevance on the labour market. In the context of the development of AI systems and automatic management, digital skills alone are not enough. Along with digital skills, placed in the first three positions in the top 10 skills for 2030, soft skills will also be needed - *Creative Thinking, Resilience, Flexibility and Agility* and *Curiosity and Lifelong Learning*. Likewise, *Talent Management* returns to the top 10 skills and has the mission to support the other skills needed on the labour market. Environmental problems and climate change, which have been growing in scale in recent years, have led to the presence of the *Environmental Management* skill in the top 10 for 2030.

Comparing the top 10 skills for 2015 and 2030, we find a significant change (Figure 4).

2015		2030
Complex Problem Solving		AI and Big Data
Coordinating with Others		Networks and Cybersecurity
People Management		Technological literacy
Critical Thinking		Creative thinking
Negotiation		Resilience, flexibility and agility
Quality Control		Curiosity and lifelong Learning
Service Orientation		Leadership and social Influence
Judgement and Decision Making		Talent management
Active Listening		Analytical thinking
Creativity		Environmental stewardship

Figure 4. Comparative analysis of top skills on the labour market in 2015 and 2030

Source: Developed by author according to Gray, A. (2016) & World Economic Forum (2025).

From Figure 4 we see that 6 skills placed in the top 10 in 2015 were replaced by new ones in 2030. 10-15 years ago, digital skills (AI and Big Data and Networks and Cybersecurity) were not even in the list of the top 10 skills. Resilience, flexibility and agility is one of the very important soft skills for employers that would ensure faster adaptability of employees to new work contexts and to cope with the new requirements imposed by digital transformation.

6. Conclusions

The labour market is influenced by contextual and technological developments taking place in society, which have a significant impact on the professional behaviour of the workforce. The accelerated development of artificial intelligence systems at the societal level has led to a reshaping of the skills required in the labour market. The research results demonstrate a direct link between technological changes that lead to a shift in the work paradigm and the skills that the workforce must demonstrate in the labour market.

In the period 2015-2030, a substantial change in the content of skills on the labour market is observed. In 2015 and 2020, soft skills were more present in the top rankings of global skills. *Complex Problem Solving*, *Critical Thinking*, *Creativity* and *People Management* were placed at the top of the list of skills, being the most requested in the labour market. Technological changes and the development of artificial intelligence systems have modified the list of skills in the following years. Digital skills have gradually made their way to the top of the list of skills. The use of robots and AI in operational processes requires more digital skills among the workforce, and the holders of these skills will have more opportunities in the labour market. At the same time, soft skills should not be neglected because robots and AI systems cannot fully replace human resources. In this context, soft skills are perceived from the perspective of the flexibility, adaptability and agility of the workforce in interaction with robots. Also, *Environmental Management* is a skill that appears for the first time in the list of top 10 skills for 2030. Climate change is guiding organizations towards this skill, which could advance in the list of skills in the future, starting from the idea that organizations are becoming more concerned about environmental issues.

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