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DOING DIGITAL BUSINESS WITH ROBOTS: NECESSARY KNOWLEDGE AND SKILLS OF EMPLOYEES IN DIGITAL AGE

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APSTRACT

The aim of this paper is to point out the new knowledge and skills that employees need to have in the digital age in which robots are becoming more and more present in the workplace. Robots started to over work tasks and activities that are routine, repetitive and highly standardized. With the progress of technology, robots are starting to take over more complex and challenging work tasks as well. As a result, employees are faced with new challenges and fears. Fear of job loss and job insecurity fostered employees to acquire new knowledge and skills that cannot be automated. Continuous learning is becoming the destiny of every individual who lives and works in the digital age.

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INTRODUCTION

In a highly dynamic and uncertain environment in which organizations operate, employee knowledge becomes a necessary resource for successful functioning, growth, and development [1]. However, the situation has changed since technology has positioned itself on the top of the list of organizational resources, putting a lot of pressure on employees. In the digital age, there is no job for which it can be said it will be certain and secure in the long run. Job insecurity represents the subjective perception that there is a possibility of losing a current job, as well as fear and constant worry due to the possibility of losing a job in the near future. One of the factors that impacts on job insecurity is the fact that most routine tasks and activities are becoming increasingly automated with robots and robotic process automation. Throughout history, every industrial revolution led to numerous changes in the way organizations function and operate. The fourth industrial revolution (Industry 4.0) and technologies such as Internet of Things, Big Data, Real-Time Analytics, Cloud Computing, Data Science, Machine Learning, Robotics, Artificial Intelligence, Blockchain, Virtual Reality, Augmented Reality and the like, enabled smart production and management systems, as well as the emergence of smart factories. Increasingly rapid technological progress caused the emergence of the fifth industrial revolution (Industry 5.0), which is primarily oriented to automatic systems, robots, algorithms and their increasing integration and collaboration with humans. The key technologies that fostered the fifth industrial revolution are oriented towards energy efficiency, cyber safe data transmission and storage, real time-based digital twins, bio-inspired technologies, smart materials, human-centric solutions, and human-machine interaction [2]. Consequently, all those technologies led to increasing automation and deployment of robots that, compared to humans, can perform more tasks with greater accuracy, speed, and fewer mistakes [3]. Employees have been threatened and challenged regarding their job security. They realized that robots are becoming a common part of the work environment, and that they need to acquire new knowledge and skills to preserve their jobs.

ROBOTS AT THE WORKPLACE: DEFINITIONS AND KEY CHARACTERISTICS

Robots are visible machines that contain sensors, actuators, and a certain level of artificial intelligence [4]. They may be in different types and shapes, and they differ according to the degree of flexibility and autonomy [5]. The International Organization for Standardization recognizes several types of robots. *Industrial robots* are automatically controlled, programmed, multipurpose machines that can be mobile or fixed in a certain place. *Professional or personal service robots* operate in an unstructured and unpredictable environment, without or with the presence of humans, but controlled by operators. *Collaborative robots* are designed to interact directly with humans. They combine human flexibility and problem-solving skills with the strength, precision, and durability of mechanical robots. *Managerial collaborative robots* are created so that instead of monotonous, repetitive, and simple tasks, they perform more complex tasks and activities using their connection to the Internet, memory, and the expressed power of analyzing collected data [6]. Regarding the way of operating, there are pre-programmed robots that perform detailed tasks in a well-defined and controlled environment, then robots that are continuously controlled by humans, autonomous robots that are able to adequately interpret the environment and take actions, as well as robots that are integrated or connected with the human body (robotic legs or arms used to help employees carry some heavy equipment) [4].

Unlike industrial robots that mainly perform routine and simple tasks, contemporary robots increasingly cooperate with people and perform non-routine and cognitive tasks [7]. They have the abilities to independently walk, talk, and perform complex and challenging tasks. It is certain that in the future, robots will have improved features and capabilities due to advancement in the field of artificial intelligence. For example, the ability of robots to recognize human emotions can be achieved by embedding sensors and recognizing facial expressions [8]. Those robots who interpret emotions have eyes that look in the direction of the interlocutor and have the ability to set appropriate facial expressions according to the feelings of the interlocutor (recognition of danger, fear, stress) [5].

FEAR OF JOB LOSS DUE TO ROBOTS AND ROBOTIC PROCESS AUTOMATION

There is a fear among employees that automation will eliminate many jobs [9]. This fear is particularly obvious in developing countries where labor-intensive activities are essential for economic growth and development [7]. However, history showed the opposite. Although during the first industrial revolution machines were able to take over as much as 98% of human activities in the textile industry, that led to increased production, lower prices, and higher demand for products. As a result, there was a need for a larger number of textile workers [10]. Furthermore, the results of a research [10] that analyzed 270 occupations in the US that existed in the 1950s showed that 232 occupations still exist today, while 37 have disappeared due to changes in customer demand or the environment. Only one occupation has disappeared due to automation - elevator operator. Data from other research that encompassed 702 occupations in the US, showed that 47% of occupations have a high risk of automation [11], while [12] found that only 9% of US employees are at high risk of automation. McKinsey Global Institute [13] found that about 60% of occupations globally have at least 30% of activities that can be automated, while only 5% of occupations have more than 90% of activities that can be automated.

With the aim to eliminate or at least reduce the fear of job loss due to robots and robotic process automation, there are several groups of activities that can be implemented [9].

1) Individual activities include everything that employees can do with the aim to avoid or reduce the negative consequences of automation. Employees can acquire new knowledge and skills that are needed in the labor market, they can learn how to apply new, modern technologies to be more productive, or they can switch to some other jobs that will not be affected by automation in the near future.
2) Organizational activities include everything an organization can do to reduce employees' fear of losing their jobs due to automation. Organizations can introduce shared working hours and reduced working time for employees who will keep their jobs. Furthermore, organizations should be able to provide adequate support and free retraining for employees whose jobs will disappear.
3) Social activities include a set of economic and administrative activities of the government and public institutions that are aimed at improving awareness and views of modern technologies -

robots. By raising awareness of the importance of automation in physically demanding and challenging jobs, people will not view technology with fear and anxiety but will gladly embrace it. Furthermore, governments should provide free education and various retraining programs to employees who have lost their jobs due to robots and robotic process automation, as well as to give them support and help in finding new jobs.

All above-mentioned activities reduce the negative effects of robots and robotic process automation on employees and their employment opportunities.

THE KEY KNOWLEDGE AND SKILLS OF EMPLOYEES IN THE DIGITAL AGE

The digital economy requires from employees to do "knowledge-intensive" jobs, compared to the traditional economy, which sought employees for "labor-intensive" jobs. In addition, there is a noticeable tendency to increase the demand for knowledge and skills that machines and robots cannot acquire and manifest [14]. For example, some authors point out that emotions and context cannot be automated [15]. Furthermore, the way and content of communication, emotional intelligence, relationships and ethical principles belong to soft knowledge and skills that are not suitable for automatization [16]. It is evident that humans cannot be as efficient and productive as machines and robots. Their advantage is in another field - in creativity, curiosity, empathy, and logic [17].

There is a list of future knowledge and skills that will be needed in the digital age. They can be divided into three groups: basic literacy, competencies, and traits [18]. Regarding the basic literacy employees will need: numerical, scientific, ICT, financial, cultural, and civic literacy. The most important competencies of employees are: critical thinking, problem solving, creativity, communicativeness, and cooperation. Regarding the necessary traits of employees, there will be raising need for: curiosity, initiative, persistence and perseverance, adaptability, leadership, social, and cultural awareness.

In the digital age organizations are faced with a new challenge - to find employees who have the necessary knowledge and skills, but also to train existing employees by applying one of the following approaches [3]:

Up-skilling of existing knowledge and skills. Organizations have internal departments or use the services of external consulting organizations to upgrade the knowledge and skills of employees. For example, the employee on the conveyor belt gets a robot to do his job, but the employee must learn to operate the robot;

Re-skilling – acquiring different knowledge and skills. Robots and robotic process automation will inevitably lead to the elimination of certain jobs. Organizations must invest in employees and provide them with retraining - the acquisition of completely new knowledge and skills;

Changing the mindset - employees should be agile, flexible, open to changes and open-minded toward new technology;

Continuous learning - it is certain that technologies will continue to develop at an increasing pace in the future. Consequently, employees will need to be ready and prepared to continuously acquire new knowledge and skills.

The process of learning in the digital age is characterized with [19]: new mental model which is oriented toward continuous learning, a culture of lifelong learning, digitally oriented learning, and personalized approach to learning and career progress. In digital age, more than ever before, employees need to have not only hard, but also soft skills (leadership qualities, stress resistance, organizational skills, charisma, temperament) [20].

There is no job that is immune to technological inventions, especially to robots and robotic process automation. It depends on the employees - on their agility and mindset, whether they will save their jobs and how quickly they will adapt to the new roles [21]. During the career in the digital age, an individual can experience the change of up to ten different technologies and systems, and consequently the way of working [22].

CONCLUSION

The aim of this paper was to point out the need of employees to acquire new knowledge and skills that will enable them to preserve their jobs in the digital age in which robots are increasingly taking over jobs and becoming the common part of the work environment.

Existing knowledge and skills are not the knowledge and skills that employees will need in the near future. Employees must be ready to constantly learn and acquire new knowledge and skills in order to successfully build their career and ensure their job security. Robots will become increasingly present in the work environment, regardless of people's occupation and profession. That is why constant learning is becoming the destiny of every individual who is living and working in the digital age.

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