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COMPETENCES 4.0 IN THE LOGISTICS SECTOR AGAINST THE CHALLENGES OF SUSTAINABLE DIGITAL TRANSFORMATION OF THE ECONOMY IN THE POLISH PERSPECTIVE

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Purpose: The aim of the paper was the identification of 4.0 competences that should be characterized by logistics workers in the era of the fourth industrial revolution.
Design/methodology/approach: First step was the desk research analysis of source material (monographic studies, publications and reports). The second step were primary (fragmentary) explanatory, descriptive and explanatory, focused on the implementation of one research goal. The method used in the course of the study was the "user-centric" CAWI (Computer Assisted Web Interview).
Findings: Technologization and robotization require from employees to acquire new digital competences. Studies show that logistics workers are aware of the needed change. There is a need to acquire competences 4.0 which can consist of cognitive, informative and technical competences.
Research limitations/implications: The main limitation of the research was the availability of employees in logistics companies and the precise division of enterprises in which the respondents were employed. In the available statistical summaries and address databases, there is no division taking into account the place of logistics as an element of business activities in enterprises.
Practical implications: Research can be also a signpost for employers of what kind of competences should be developed in the future in the face of upcoming economy 5.0 and society 5.0.
Originality/value: The article can be a road-map for sustainable digital transformation taking into account not only machines but also human beings.

Keywords: digitization, competences 4.0, sustainable economy, logistics.

Category of the paper: research paper.

1. Introduction

The basis of the functioning of modern societies is the digital revolution. The wealth of information and knowledge of generations stimulates development, signaling the enthronement of Society 5.0 and Economy 5.0. The boundary between what is digital and what is biological is already blurring, interfering with the way companies and economies operate. Big data, cloud computing technologies, mobile connectivity possibilities, automation and robotization result in transformation and integration of vertical and horizontal value chains with the progressive role of the client as an inducer of digital transformation of enterprises.

In view of such a digitized image of reality, there is a growing demand for employees who have the skills to tune enterprises to the pulse of digital beats and bits. This aspect inspired the authors to undertake an in-depth analysis of both secondary and primary sources. Among the existing industries, the authors decided to study the adaptation of employees' competences to the requirements of the digital economy in the logistics industry. The reason for the choice was the fact that the logistics industry, dealing with the integration and coordination of processes, is highly dependent on innovative technical solutions. Moreover, logistics companies, being the closest to customers representing the digital economy, integrally follow the digital transformations of the business environment.

Today, logisticians very often participate in the processes of recalibration of structures and methods of operation of enterprises in which logistic processes are carried out. Employees dealing with logistics, having hard technical competences and embedded in them soft social competences determining creativity, effectiveness and efficiency, can flexibly adapt to changing conditions, improve existing solutions and generate new ideas, as well as learn new competences. What is important in this process is how employees perceive themselves and to what extent they assess their scope of competences, and whether they see the need to strengthen it.

The authors of this article undertook the challenge of diagnosing the current state of the competence assessment of employees dealing with logistics, which includes both employees of the TSL industry and employees performing logistic tasks in enterprises whose logistics is not the domain of activity. For this purpose, the authors focused on the identification of 4.0 competences that should be characterized by logistics workers in the era of the fourth industrial revolution. Consistently, the considerations undertaken in the study were aimed at obtaining arguments to verify the hypothesis: "In the era of economy 4.0 and the upcoming economy 5.0, a logistics employee should be distinguished by competences 4.0 identified with the emanation of cognitive, social and technical competences, which enable him to be open, flexible, effective and efficient acting in the context of social and economic development and networking".

On the basis of the results of the desk research analysis of the existing Polish and foreign-language source material (monographic studies, publications and reports), the authors presented the results of analyzes of the collected primary material, including the self-assessment of logistics employees in the area of competences 4.0. An important and innovative element of the study is the self-assessment approach made by logistics employees. In the literature on the subject, such an employee perspective in terms of the desired competences in the context of Economy 4.0 is presented to a small extent and in individual publications. Therefore, according to the authors, it was worth adopting such a perspective.

2. Sustainable changes in the economy in the context of digital transformation

The third decade of the 21st century is a time of sudden, abrupt changes in the economy spreading on a global scale. They are referred to as digital disruption (Hill, 2017), because their key feature is discontinuity in the face of traditional legal, social and business conditions and being rooted in the digital environment, on the one hand serving as an incubator of changes, and on the other – simultaneously or separately – a strong factor transformation of economic processes. One of the main changes required is digitization and the use of information technology (Ingaldia, Klimecka-Tatara, 2022, pp. 237-246). The dynamics of changes brought about by the digital revolution creates the need to educate and improve the competences of the future, which will enable openness to changes. The rapidly growing amount of data and the convergence of different technologies that have emerged with the definitive introduction of information and communication technologies are transforming all areas of the economy. These technologies offer enormous potential for economic growth. The constant convergence of the real and virtual worlds is the main driver of digitization and change in all sectors of the economy. These changes, which all companies have to deal with, can affect entire industries, changing the way goods are designed, manufactured, delivered and paid for, or the process of providing services. Advances in digitization have led to wide and varied questions about the future of society (Dufva, Dufva, 2019, pp. 17-28). Digital solutions that put people first, create new business opportunities, encourage the development of credible technology, foster an open and democratic society, create space for a dynamic and sustainable economy, and help combat climate change (Transformacja cyfrowa, 2022). Meanwhile, Poland – from the European and global perspective – is one of the countries affected by the crisis of digital competences necessary for the country's development, including in the field of Industry 4.0. In most competency rankings, it has been in the top five countries of the European Union for years (Agencja Rozwoju Przemysłu S.A., 2020).

Digitization is often referred to as one of the mega-trends shaping the future, which refers to the activities of transforming various previously physical or analog activities into digital data systems. The concept of the digital economy first appeared in the mid-1990s. According to Don Tapscott, we are entering an "era of networked intelligence" where intelligent machines and people connect through technology. A similar definition was proposed by Erik Brynjolfsson and Brian Kahin, according to whom the digital economy is "the last and still largely unrealized transformation of all sectors of the economy thanks to the computer digitization of information" (Brynjolfsson, Kahin, 2000, pp. 295-324).

The European Commission, which presented the vision and direction of digital transformation in Europe by 2030, proposed the compass of the digital decade in the European Union, pointing to four most important directions (Europes digital, 2021):

- digital skills,
- secure and sustainable digital infrastructure,
- digital transformation of enterprises,
- digitization of public service.

The European Union promotes a digital agenda focused on human needs and adherence to EU norms and standards. It cares about the security and resilience of its digital supply chains and provides global solutions in this area. These goals are achieved through the implementation of digital economy packages funded through initiatives combining funds from the EU's Member States, companies and partners with similar goals, and the development of a toolkit linking regulatory cooperation, capacity and skills building, and investment in international cooperation and research partnerships. In this way, Europe is preparing businesses and all Europeans for a human-centered, sustainable and prosperous digital future. Digital rights and rules provide a reference framework for citizens in terms of their digital competences, and guide EU Member States and businesses with regard to new technologies. They are designed to help all EU citizens to get the most out of the digital transformation (figure 1).

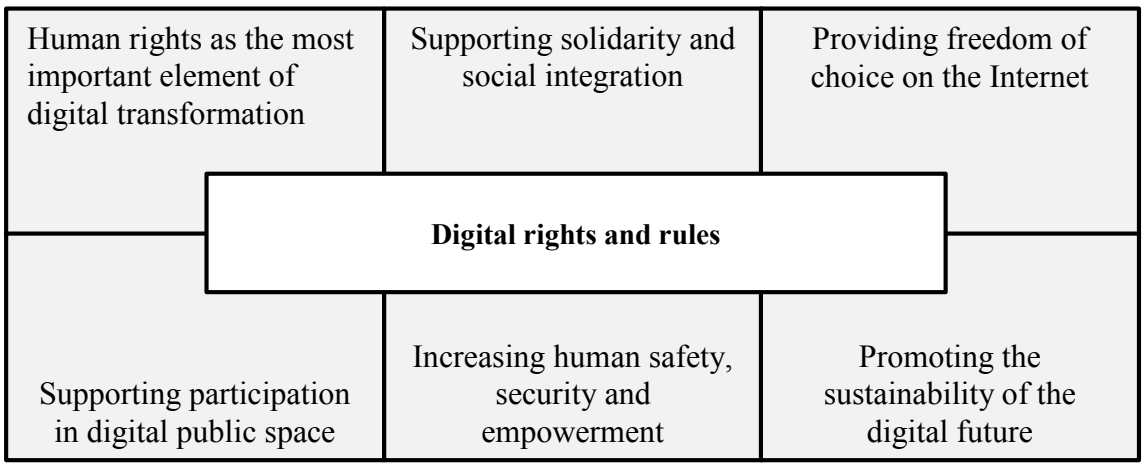

Figure 1. Digital rights and rules.

Source: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_pl.

The research of the Economic and Social Research Council (ESRC) shows that most of the definitions in the literature on the subject define the digital economy through the prism of the use of new technologies. It includes the physical infrastructure on which digital technologies are based (broadband lines, routers), devices used for access (computers, smartphones), applications that power it and the functions that provide it (Internet of Things, data analytics, cloud computing) (Dahlman, Mealy, Wermelinger, 2016). It consists of goods or services the development, production, sale or provision of which depend entirely on digital technologies (Kling, Lamb, 2000, pp. 295-324). It is a combination of several general purpose technologies and many economic and social activities carried out by humans via the Internet and related technologies, and functions thanks to digital technology, in particular electronic transactions carried out over the Internet (OUP, Digital Economy, 2017). The digital economy can also be characterized as a global web of economic activities, functioning thanks to the existence of information and communication technologies (ICT) (Rouse, 2016). The pillar of the digital economy is hyper-connectivity, meaning the growing interconnection of people, organizations and machines, enabled by the Internet, mobile technologies and the Internet of Things (IoT)" (Dahlman, Mealy, Wermelinger, 2016). In 2017, the UN agency UNCTAD recognized that the new digital economy is developing thanks to the implementation of advanced cyber-physical systems (combining machines, employees and IT systems). Includes technologies and processes based "in one way or another" on advanced information and communication solutions, such as: robotization and production automation, new data sources from mobile and ubiquitous Internet connectivity, cloud computing, big data analytics and artificial intelligence. UNCTAD experts noted that "these technologies will radically reduce the need for routine tasks and change the location, organization and content of mental work" (UNCTAD, 2017). To sum up, in the vast majority of the above-mentioned definitions, the digital economy is equated with the fact of using new technologies.

The current business environment is characterized by an unprecedented degree of volatility, uncertainty, complexity and ambiguity (VUCA) (Szalavetz, 2022, pp. 332-343). Digitization is certainly the main driver of change in most sectors of the economy, but also of profound social change. According to J. Pieregud (2016), the key factors driving the development of the digital economy are currently:

- Internet of Things (IoT) and Internet of Everything (IoE),
- hyperconnectivity,
- cloud-based applications and services (*cloud computing*),
- Big Data Analytics (BDA) and Big-Data-as-a-Service (BDaaS),
- automation and robotization,
- multi-channel and omni-channel distribution models of producst and services.

In March 2021, the European Commission adopted a new development strategy in the socio-economic sphere – Digital Compass 2030. It defined the main directions of digital transformation of Europe. In the field of basic digital skills, the European Union's goal for 2030 is to have them at least 80% of society. According to the The Digital Economy and Society Index 2021 (DESI, 2021), Poland ranks 24th among the 27 EU countries when it comes to digital skills of the society. Only 44% of Poles aged 16-74 have basic digital skills, although most jobs require such skills (Digital Economy and Society Index, 2021). Digital competences of employees are one of the main determinants of the development of companies from an increasing number of industries, including the logistics industry. They are characterized by reference to skills, knowledge, behavior, attitudes, abilities and character traits (Kispeter, 2018).

The logistics industry plays a key role in the economy and society, pooling available resources to increase the efficiency and effectiveness of logistics companies (Grubmuller, Duerkop, Huth, 2021, pp. 313-325). Logistics companies are interested in digitization because they perform better in a competitive market (Psomas, Kafetzopoulos, Gotzamani, 2018, pp. 54-73). Digitization in the logistics industry offers many opportunities and challenges in the context of the environment and climate or job creation. A strategic and sustainable development approach to identifying various aspects of the impact of technology on the economy is necessary for the responsible management of enterprises, for the benefit of enterprises, as well as the entire socio-economic and natural environment. The use of digitization in logistics contributes even more to the implementation of intelligent devices, distributed intelligent hierarchical systems, various management and control solutions, automatic identification systems, network communication systems or standardized ICT networks and internet cloud solutions (Illés, Varga, Czap, 2018). These changes significantly affect the functioning of the economy and the labor market. New technologies influence today's work and change the social attitude towards the organization and design of work (Terhoeven, Tegtmeier, Wischniewski, 2022, pp. 302-307). Against this background, the question arises, what does human-oriented work design have to look like in the digital age? In order to define the indications for the design of a job, you first need to find out what working conditions actually exist for each task and what is their level of digitization. Numerous studies in this area indicate the acceleration of technology and industry convergence and highlight the role that digitization gives these processes further momentum. Research shows that the development of new ICT technologies has enormous potential to support employees.

3. Competences in Industry 4.0

Industry 4.0 is a technological, process and organizational transformation of enterprises. Its condition is the advanced use of digital solutions and data resources, and its goal – mass

personalization of the production of goods and services in response to the individual needs of customers. (Śledziewska, Włoch 2020) The fourth industrial revolution introduces a number of technological changes, also for the functioning of enterprises. But regardless of the size of the enterprise, its structure and other attributes, employees are its most valuable, strategic capital: the capital of qualifications, knowledge, skills, experience, personality and values. Human capital is treated as the most important part of intellectual capital, which, in cooperation with structural capital (capital of processes), is in the modern economy based on knowledge, the basic sources of competitive advantage and the value of each company (Gorustowicz, 2019, pp. 75-85) Therefore, in the labor market, competences that distinguish human work from the work of IT systems, robots or artificial intelligence are of particular importance today.

C. Levy-Leboyer (1997) pointed out that competences refer to the integrated use of abilities, personality traits as well as acquired knowledge and skills, which guarantee the possibility of achieving the assumed goals and strategy of the enterprise. He treated competences as a specific category of individual features that are closely related to value systems and the acquired knowledge. M. Butkiewicz (1995) distinguishes between the concept of competence and qualifications. The first is defined as the scope of knowledge, skills and responsibilities, powers of attorney and authority to act. On the other hand, he describes the latter as professional and defines it as a system of knowledge, skills and attitudes conditioning the performance of the tasks entrusted to an employee. According to this author, qualifications include such factors as: education, professional knowledge, professional skills, psychophysical skills and professional ethics. T. Oleksyn (2010, p. 18) points out that competences are formal powers to make decisions, deal with matters and represent an organization. And these powers to act are the main element that distinguishes competences from qualifications that do not contain this element.

Regardless of the conceptual construct adopted, it should be pointed out that competence is the ability to use effectively the knowledge and abilities at work. On the other hand, qualifications can be equated with education and professional experience.

There are many divisions of competences in the literature on the subject. You can talk about the so-called core competences (corporate), which are related to the vision of the company and constitute a description of behaviors, values and attitudes important for its implementation. Having them by all employees is crucial for the organization, but they do not reflect the full set of skills, knowledge and attitudes needed for a given position. Therefore, they are complemented by executive competences (Oleksyn, 2010, p. 33).

Competencies can be divided into soft, relating to character traits, and hard, indicating skills that can be called technical (e.g. language skills, computer literacy, knowledge about management processes or building a specific device). Another division is the so-called key competences allowing the employee to effectively perform work in a specific position (Oleksyn, 2010, p. 20). We can talk about threshold competences, i.e. the minimum ones required to work in a given position. There are also optimal competences that lead to the achievement of the assumed desired results. When starting work, the employee is required to

cope with basic tasks and all other competences that go beyond this level are highly rated (Armstrong, 2002, p. 245).

Among the lists of key competences (Janowska, Skrzek-Lubasińska, 2019), the most common ones are: knowledge and its application, understanding, critical thinking, problem solving, adaptive learning, as well as group work, controlling emotions, commitment, reliability, honesty, punctuality, independence and creativity. Many of them are classified as competences of the future, although the importance given to them varies depending on the approach and methodology adopted. According to the report of the World Economic Forum, where you can find a list of the main professional skills based on the O * NET platform and its Content Model10, the most desirable competences are: comprehensive problem solving, social skills, such as cooperation with others and process skills, which include critical thinking or active listening (World Economic Forum, 2016). Due to the new paradigm of work in the digital economy, which is flexibility, the most important skills will be those related to the constant adaptation to new conditions. This applies, inter alia, to changes in qualifications in line with market expectations, i.e. the ability to continuously learn, the ability to adapt to work in new teams, with constantly different people.

Industry 4.0 is not only a technological change and the related need for a different dimension of human-machine cooperation, but also new competences required from employees who, as participants in the 4.0 revolution, must develop the ability to constantly learn and constantly self-develop. The competences of the future can be divided into three main groups: cognitive, social and functional (Debowski, Stechly, 2019). Bearing in mind that the concept of functional competences should be understood as the ability to perform specific work, specific professional tasks, they can be identified in the context of Industry 4.0 with digital and technical competences. Social competences include, among others: effective cooperation in a group, leadership and entrepreneurship, emotional intelligence, people management. These are key competences when it comes to dealing with change, building openness in the face of uncertainty. Emotional intelligence is especially important, as it is responsible for successful cooperation with others, for the manner of expressing emotions. Developed interpersonal skills are equally important as companies undergoing digital transformation will look for employees who can work well with others and support the company together. On the other hand, cognitive competences (commonly known as thinking competences) include: critical thinking – the ability to think in a rational and orderly manner, aimed at understanding the relationship between facts or concepts. It should be noted that the development of the Internet has led to an "overload" of information, and therefore the skills to assess the quality of the collected information and to identify reliable information are of key importance. Creativity – no matter how much digitized is (will there be) the work environment, how much artificial intelligence enters professional activity, a person is still more effective in proposing non-standard solutions to problems. Future labor market challenges and the jobs created will require employees to be highly creative, new ways of thinking and going beyond the usual patterns; cognitive

adaptability and flexibility – the ability to adapt to a changing environment. We are not able to fully predict what competences the future employers will need, therefore it is important to focus on lifelong learning and openness to new challenges; reasoning and solving complex problems. The third group includes digital and technical competences (equated with hard skills), among which digital competences are particularly important, which are not limited only to programming or data analysis, but cover a wide range of skills: from digital problem solving to knowledge of privacy or cybersecurity. As digital tools will become commonplace and the logistics industry will be affected by the fourth industrial revolution, all employees (in almost every workplace) will need technical skills. IoT (Internet of Things), virtual and augmented reality, artificial intelligence, robotics, automation and other modern technologies will become an inseparable part of the everyday experience of every employee (Barwińska-Małajowicz 2020, p. 19). It should be noted that competences will change through the progressive automation and servicisation of economies, diffusion of technological progress, internationalization of organizations, globalization and demographic changes (Szukalski, 2017, p. 260). The Competency Impact highlights the need to develop both transversal skills (from execution to entrepreneurship) and digital interactions between people and machines. The impact of the digital revolution is particularly relevant to companies seeking to maintain their business competitiveness by becoming part of this new paradigm. The players of the Fourth Industrial Revolution are companies deeply committed to the transformation process, which is both a powerful opportunity and a difficult challenge (Fregnan et al., 2020). While digital technologies offer many opportunities to lower costs, accelerate operational processes, and enhance collaboration between HR stakeholders, there are also downsides such as the digital divide, hyper-connectivity, reduced face-to-face contact and the loss of relevance faced by tech professionals.

It is worth emphasizing that the logistics industry, operating in the modern dimensions of the Industry 4.0, must also adapt to the implementation of innovative technologies, modern work process organization systems, and task implementation systems. Organizational success and building competitiveness force a redefinition of the needs of human capital, in particular its qualifications and competences. Manpower conducted research in 2021 (Raport Logistyka w Polsce, 2021), pointing to the shortages of experienced and appropriately qualified staff, among others in such positions as: warehouse manager, logistics process engineer, logistics expert, freight forwarder, quality management expert, export specialist, freight forwarder, warehouse management employee, etc. This situation results mainly from the necessity to introduce changes concerning, inter alia, new trends in the organization and management of logistics activities, the need to implement new technological, ICT (*information and communication technologies*) and product solutions, etc.

Research carried out by Manpower shows that employers in the area of logistics are looking for both hard and soft skills. The most desirable hard competences include: the ability to plan continuity in the supply chain, technical inspection qualifications, knowledge of foreign languages, forecasting skills, operation of WMS (*warehouse management system*) systems, competence in process optimization or knowledge of issues in the field of artificial intelligence and automation. Key soft skills include: responsibility, cooperation, openness to permanent learning and development, mobility, the ability to adapt quickly, the ability to recalibrate to changing working conditions, independence in action, transparency and the ability to multitasking.

The indicated exemplary competences are a response to the modernization of the Industry 4.0, which profoundly changes the operating environment in the field of logistics and requires it to adapt to broadly understood innovations. In the document 2009 Interim Report on the OECD Innovation Strategy (OECD Annual Report 2009), key assumptions were identified, which are based on the following assumptions:

- innovation is a "necessity" to meet global challenges,
- the world economy is undergoing many transformations which have a profound impact on the way innovations occur,
- non-technological, organizational and social innovations gain importance,
- the innovation process often requires the introduction of a new business model, entrepreneurs play an important role in creating innovation,
- innovative processes implemented by entities connected in the network help to engage resources from various areas (institutions, enterprises), which helps to satisfy scarce resources (including knowledge and skills),
- a broader understanding of innovation poses new challenges to policy,
- it also requires better tools to shape it,
- the innovation process is burdened with risk (as well as costs) and it is an element that has not changed over the years,
- innovation leads to specialization along the value chain, increased cooperation and partnership, and the development of the knowledge economy;
- research combined with public investment play a key role in shaping the innovation of the economy.

This situation forces the logistics industry to transform in the trend of digitized economy 4.0.

4. Changing needs and expectations on the labor market – employers' requirements

The 21st century brought a number of changes concerning the specificity of the organization's functioning, its management system, including the organization of work processes (Kurt, 2019). In the environment in which modern business entities operate, there are many determinants that affect the way of shaping success and competitiveness, leading organizations to increase readiness to change and reduce mismatch by increasing their innovation (Todt et al., 2019). The key variables include changes in the structure of the population of employees belonging to different generations, representing different attitudes, morale, skills, experience and competences. As a consequence of the transformation of the approach to work, employees expect the crystallization of different expectations from employers, professional work and the shaping of career development paths (Jerman et al., 2019).

Of course, managers do not remain passive to the changes taking place in their environment. They monitor transformations in the area of modern solutions implemented in organizations that give them a chance to build organizational success, analyze the business and organizational side as well as the quality and quantity of human resources. They must be correlated with each other, adjusted to the company's strategy, increasing its chance to adapt to the changing environment (Behling, Lenzi, 2019). The fact that employees are always the most valuable organizational capital shows that managers must, on the one hand, respond to the changing expectations of the staff, and on the other, they are determined to look for employees who best fit their organization and the adopted management concept. Such a situation makes it necessary to look for solutions that will help to face contemporary economic, ecological and social challenges (Wygnański, 2009, p. 4).

Organizations see the possibility of shaping conscious, responsible relations between economic development, care for the environment in which they operate and satisfying diverse needs in the concept of sustainable development (Petrişor, Petrişor, 2013). In the Our Common Future report, this approach was defined as development that meets the needs of the modern generation without compromising the ability of future generations to meet their own needs (Brundtland, 1987). Therefore, today, employees more and more often no longer constitute the cost of the organization, but are a profitable investment that largely determines the market value of a modern company.

Currently, the development of the enterprise is often spontaneous and difficult to predict, and the employee-employer relationship is increasingly changing its direction from subordination to partnership-based cooperation and more and more often cooperation identified as "a manifestation of cooperation for a common goal with which the cooperating parties identify" (Polak, 2016, p. 286; Lipka, 2004, p. 17). Collaboration is a more advanced type of cooperation, meaning "coordinated action aimed at the implementation of partial tasks resulting from the division of labor or inter-organizational links resulting from concluded contracts and agreements that facilitate or enable the implementation of specific tasks" (Kaczmarek, 2000, p. 5).

Managers today expect much greater innovation in work processes, openness to training and development, professional experience, commitment, pro-ecological attitude to work processes, language competences, time management skills, modern leadership, flexibility, which is a condition for effective functioning on the market (Wilsz, 2016). Organizations using this approach clearly indicate that such a situation brings with it both many opportunities and threats for employees. On the one hand, employees are treated as internal stakeholders who have a real impact on organizational processes, they are given the opportunity to increase their attractiveness, and on the other hand, they are expected to be ready to constantly change, to be agile and to adapt to evolving processes.

The development of new ICT technologies (Information and Communication Technology) means that modern employers, creating new jobs, are increasingly looking for employees on the market with developed skills to work with modern technologies, processes correlated with modern technology, network work and multi-processing (Evans, 2016). Employers expect agility from employees and skillful "changing over" between the tasks carried out in such a way that it does not adversely affect the effectiveness of their implementation. The phenomenon of multitasking has become today a determinant of the effective implementation of business goals and tasks, both in the individual and organizational dimensions. The very nature of work is also changing, taking more and more virtual and flexible forms (Alvesson, 2016; Lauda et al., 2015). This situation results in the formation of new professions and the marginalization of others. This situation leads to the employee competency gap. This, in turn, makes it necessary to identify competences and professions that are in demand on the labor market in the near future (Delia et al., 2016). Knowledge in this area will help to better prepare future employees to function on the labor market.

Many organizations aware of the importance of competences, qualifications and skills possessed by human capital indicate that the use of effective ones has become important and effective business models. They are designed to help the organization function in precarious conditions and bring it closer to achieving success. This model should be treated more as a specific way of thinking, directed at unique or non-standard ways of solving organizational problems through which the organization can change and develop in a creative way (Sobińska, 2015). The company, guided by this type of model approach, shapes specific expectations for

the staff. These requirements, defined as key, are to create added value for the groups of stakeholders, which are the employer and the employee (Doligalski, 2013). Importantly, modern organizations place more and more requirements on suppliers of human capital. It is assumed that the world of education should prepare an appropriate offer in order to equip potential employees with the knowledge needed for the needs of the future labor market or to shape attitudes aimed at releasing dormant layers of competences (Bencsik et al., 2016).

Organizations striving for organizational effectiveness, while building a competitive advantage, should be aware of what potential they are looking for – what competences, know-how and to which they have access (Mahmood et al., 2018).

For this reason, they should constantly monitor the variables included in people management systems so that the model they choose helps them to guarantee the best possible staff creating and contributing to the success. Shortened decision-making processes, flattening structures, delegating powers, participatory management model are the attributes of flexibility and the perspective of advantage (Brilman, 2002, p. 391). Moreover, the sensitivity of a contemporary and modernly managed organization is correlated with the ability to build the capability to flexibly respond to emerging threats and opportunities in the organization's environment.

5. The specificity of the logistics industry - transformation in the trend of digitization

Digital transformation requires implementation, speed and response from various enterprises. The logistics industry was also not indifferent to these changes. There is even a certain synergy between technology development and the boom in the logistics industry. On the one hand, it is thanks to innovative, digital technologies that the logistics industry can function better, respond faster to customer needs, and have greater opportunities to make its processes more flexible. On the other hand, it is the needs of the logistics industry that influenced the digital world, forcing the search for new solutions that will enable this faster response to the needs of a changing market. The important point is that both of these worlds pursue a common goal of responding to a turbulent environment.

In the current situation, most enterprises and industries operate in the so-called VUCA (ambiguity, uncertainty, complexity, volatility) environment. This theory is not a novelty in the world of considerations, especially in relation to personnel management (Horstmeyer, 2020), supply chain (Saikouk et al., 2021), selected industries (Hoeft, 2021), or in the context of challenges related to the use of modern technologies (Kaivo-oja, Lauraeus, 2018). According to this theory, the environment is characterized by: ambiguity, because it influences the entities functioning in it in various ways; uncertainty due to constant changes in conditions resulting

from various economic, social, legal and political phenomena; complexity as it is influenced by many interrelated factors; variability, which results in a way from the previous factors, but is also an expression of interdependencies taking place in the environment.

The current situation in the world was caused by the Covid-19 pandemic, as well as by geo-political conditions. Unfortunately, this causes many problems in various industries around the world, including Poland. Therefore, it can be concluded that the challenges of the turbulent environment mean that enterprises and supply chains have to face many problems.

These problems do not bypass the logistics industry, which is a link for various industries, provides services supporting basic production and commercial activities, and may also contribute to increasing market share and gaining a competitive advantage. The situation of the logistics industry in recent years can be characterized by three elements: growing customer requirements and expectations, sustainable development with the use of ecological solutions in logistics processes, the use of innovative technologies supporting the organization and implementation of tasks. The logistics industry operates in very specific conditions, because it serves both industry, acting as a link in supply chains in various parts of the economy, it must meet the requirements of individual customers, which it serves on behalf of commercial enterprises, and is responsible for its own actions towards society and the economy by adapting to legal requirements, ecological and social trends. The logistics industry consists of many different entities that provide services for both industry and individual clients. Logistics services provided by logistics operators relate to transport, warehousing, material and packaging manipulation, inventory management, reverse logistics management, as well as ensuring an appropriate flow of information. (Bozarth, Handfield, 2019). Logistics operators usually offer services tailored to the needs of industrial customers by providing contractual services. Flexibility in the approach to logistics services is a challenge, but it has also become a necessary element (an order winner).

Recent years have seen the growing importance of the logistics industry in Poland. According to the report of 7R and Colliers (Logistyka wolniej, 2022), in the first quarter of 2022, the total supply of warehouse space in Poland amounted to 25 million sq m, and thus increased by another 1.3 million sq m. The demand for logistics services has certainly increased due to the pandemic and online sales support. It has been estimated that in 2020 in Poland, sales on the e-commerce market increased by 30%. Currently, e-commerce already accounts for 10% of all trade in Poland (Kopańko, 2021). At the same time, it is estimated that in Europe, turnover in online cross-border trade will increase by 51% in 2022. However, without the participation of logistic support, these results would not be possible. Logistics support certainly played a key role due to the growing needs of e-commerce customers. On the one hand, the service of online sellers as principals, and on the other hand also online buyers as individual recipients, meant that the logistics industry, especially CEP (courier-express-parcel), had to adapt to various expectations. Hence the growing demand for warehouse space. On the other hand, from the perspective of clients/individual recipients, appropriate service of the so-called last mile

service. The KEP market around the world handles over 200 million parcels per day. The world network consists of over 2.5 million cars, 1000 airplanes, several hundred thousand trucks connecting hundreds of central sorting plants and thousands of branches around the world (Miliardowe przychody kurierów, 2020). Such a situation requires proper coordination and the use of innovative solutions in the field of quick response to customer needs. Therefore, the logistics industry focuses primarily on modern technology. The last decade was marked by the fourth industrial revolution, which in logistics received its own name Logistics 4.0. On the one hand, researchers claimed that this term covers real-time data analysis, innovative manufacturing technologies, robots and autonomous vehicles, and real-time data exchange (Strandhagen et al., 2017). Others noted that it was mainly about the transparency and flexibility of supply chains, as well as the ability to track materials and products in real time (Hofmann, Ruesch, 2017). However, no single, unambiguous definition of this term has been presented (Dallasega et al., 2022).

These technological changes are primarily the use of IT systems that allow for real-time tracking of all operations. Pfohl (2016) mentioned as significant, first of all, communication systems between machines/robots, the use of the Internet of Things, especially in industry (e.g. in factories, smart factories), robots and autonomous vehicles, or augmented reality.

The use of such innovative technologies was not only to meet the needs of the market in terms of speed of response, but also to meet the needs related to the growing demand for services, with simultaneous staff shortages. (Cichosz et al., 2020). However, despite the automation of processes in logistics 4.0 through the use of robotics in warehouses (Nantee, Sureeyatanapas, 2021) or innovation in transport (Dong et al., 2021), it is inevitable to employ specialists or develop new digital competences that will enable the effective use of such inventions (Singh et al., 2022).

An appropriate approach to sustainable development is also important for the logistics industry, which in this case may mean the use of modern technologies, while developing human capital and caring for its well-being.

Sustainable development in logistics is primarily the application of innovation to reduce the negative impact on the natural environment (Javaid et al., 2022). The tasks of information systems are, above all, optimization of the course of processes in order to increase efficiency with less use of warehouse or transport resources (Ali, Phan, 2022; Gerhátová et al., 2021; Thaller et al., 2021). Support for information systems can also be useful in the context of building closed-loop chains that will aim for a zero environmental impact. Such possibilities are provided by simulations of material circulation systems or systems tracking the flow of materials and products in the supply chain (Bag, Pretorius, 2022). Another aspect may also be the impact on shaping the marketing potential and responding to the expectations of customers in the logistics industry, especially individual customers. It is mainly about the use of technology in pro-ecological activities, and thus increasing the competitiveness of the offer (Fallahpour et al., 2021).

Moreover, a very important task of innovative technologies is to facilitate work and reduce the burden on employees (Aloini et al., 2022). Taking care of employees' well-being should also be a response to new social challenges. From the perspective of the Covid-19 pandemic, it is certainly one of the factors that allows for increased efficiency and loyalty among employees.

Considering the growing importance of innovative technologies, it should be noted that the logistics industry is facing a new challenge. On the one hand, it is important to take care of the natural environment and, in the context of sustainable development, reduce energy consumption and the negative impact on the environment. On the other hand, you should take care of employees who will operate innovative technologies. Digital competences will become an essential element for these IT systems, robots and autonomous vehicles to be fully utilized and used efficiently.

6. Competences 4.0 in the logistics industry in research representation

Research covering the measurement of the competences of employees in the logistics industry was carried out among employees of enterprises at the turn of April and May 2022. Due to the source of measurement, these studies can be described as primary (fragmentary) explanatory, descriptive and explanatory, focused on the implementation of one research goal. The subject of the measurement was to define the digital skills and competences necessary for employees of the logistics industry in the era of the challenges of the economy 4.0. The method used in the course of the study was the "user-centric" CAWI (Computer Assisted Web Interview). Questionnaire consisting of 17 closed questions, including 10 based on the scaling of attitudes according to Rensis Likert, placed on the Google platform. Due to the scope of the measurement, the study can be described as fragmentary and deterministic.

The study covered not the entire population of people working in logistics at the turn of April and May 2022 in enterprises operating in Poland, but only a part in the form of a research sample. The minimum size of the sample was quantified assuming the representativeness of the sample for the working population of Poland in working age, i.e. men aged 15-64 and women aged 15-59, whose number as at December 31, 2020 was 16 555 000 people. Important information for calculating the fraction is the number of employees employed in logistics enterprises (Central Statistical Office in Poland: classification of enterprises Transport and Warehouse Management Department) operating in Poland, the number of which as at December 31, 2020 was 933 500 people and the number of people working in the logistics departments of companies whose logistics is not the dominant feature. With this approach, it was difficult to determine the actual number of employees due to the unknown number of employees employed in logistics in enterprises whose logistics is not a dominant. Therefore,

for the purpose of calculating the minimum sample size, the fraction size was assumed at the level of 0.5 both for people potentially working in logistics and 0.5 for people not working in logistics among people working in Poland as of December 31, 2020 with a random error of 5% and a confidence level of 0.95.

The formula (1) was used to calculate the minimum sample size:

$$n_{min}=NP(\alpha^2 \cdot f(1-f))/NP \cdot e^2+\alpha^2 \cdot f(1-f) \quad (1)$$

where:

n_{min} – is the minimum sample size,

NP – the size of the study population,

α – the confidence level for the results,

f – fraction size,

e – assumed maximum error.

After making the calculations, the minimum sample size was n_{min} = 384 units. The recruitment of study participants was carried out on the basis of the non-random selection of units typical for the snowball test, which means that the request to participate in the study was sent via social networking sites on logistics to all persons meeting the conditions of the study participant: age over 15 years and employment and work performed in the scope identified with logistics. In the selection of individual participants of the study, non-random sampling was used, therefore it is difficult to fully assess the representativeness of the samples in a statistical sense due to the lack of randomness. However, due to the size of the received sample, it is possible to infer.

The collected research material in the form of raw data was coded and statistically analyzed using the SPSS program (Statistical Package for Social Sciences). The result of the work is the presentation of the profile of the studied sample and substantive data presenting, according to the respondents, the scope of digital skills and competences necessary for employees of the logistics industry in the era of the challenges of the economy 4.0.

625 participants took part in the study, which is more than the calculated necessary minimum number. The studied sample was dominated by men (55.2% of the respondents) compared to women (44.8% of the respondents). Taking into account the age of the respondents, the largest group (40.6%) are people aged 21-30. The remaining respondents were aged 31-40 (33.1%), 41-50 (16.3%), 15-20 (7.7%) and over 50-64 (2.2%). In turn, taking into account education, more than half of the respondents (55.4%) have secondary education, and every fifth respondent (21.4%) has secondary or higher education (21.0%). The smallest number of people had primary education (2.2%).

Taking into account the size of the enterprise, the vast majority of respondents (42.4%) are employed in enterprises employing over 250 people. Every third respondent (31.2%) works in an enterprise employing up to 50 people and almost every fourth respondent (26.4%) in an enterprise employing between 50 and 250 people. The enterprises in which the respondents

are employed are mainly enterprises operating on an international scale (53.6%). Every third (32.8%) respondent declares that the company in which he works operates on a national scale, slightly more than tenth (13.6%) is employed in a company operating on a local scale. With regard to the place of logistics in the formula of the company's operation, every third respondent (32.8%) represents a company in which logistics is important (the company has a Logistics Department). Almost every third respondent (28.0%) works in a company where logistics is key (represents the TSL industry). Every fifth respondent (21.6%) admitted that logistics performs a secondary function (a single employee is responsible for logistics activities) and every fifth (17.6%) that logistics supports the company's core activities (logistics unit).

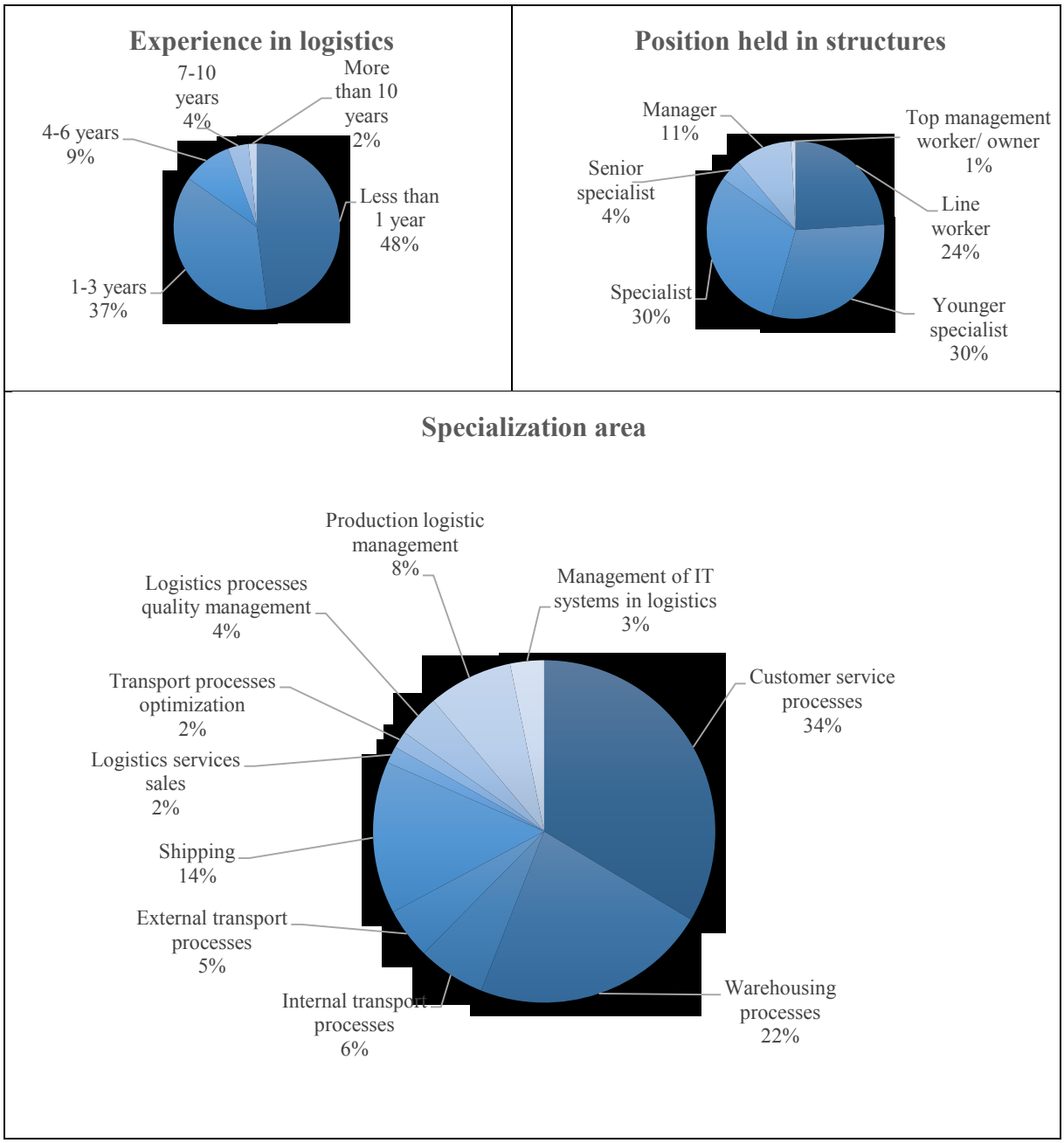

Figure 2. Profile of the respondent as a logistics employee.

Source: own research.

The respondents participating in the survey admit that the majority of them have little experience of working for less than 1 year (48.0%) or from 1 to 3 years (37.0%). The vast majority of the respondents are employed in positions such as: junior specialist (30.4%), specialist (30.4%) or line worker (24.0%). Few of the respondents are employed as a manager (10.4%), senior specialist (4.0%) or represent top management employees (0.8%). With regard to the area of logistics activity, the respondents admit that it is most often the area of customer service (33.6%), warehousing (22.4%), shipping (14.4%), production logistics (8.0%) or internal transport processes. (6.4%).

The respondents, when asked about having 4.0 competences necessary in the era of the digital economy, admit that among cognitive competences, they can definitely solve problems quickly (86.4%), take steps towards self-improvement (83.2%), are focused on critical thinking (73.6%), analytical thinking (72.0%) and complex problem solving (70.4%). On the other hand, when it comes to social competences, employees are definitely oriented towards good relations and creating bonds in the team (85.6%), good organization of working time (84.8%), and attention to constant flow of information in the team (82 , 4%), ethics and high work standards (81.6%), motivating colleagues (75.2%) and supporting innovation (73.6%). In terms of the third component, i.e. technical competences, the respondents admit that they have substantive knowledge in their area of specialization (71.2%), have specialized education (66.4%), use at least one foreign language (61.6%) and operate machinery and technical devices (56.8%).

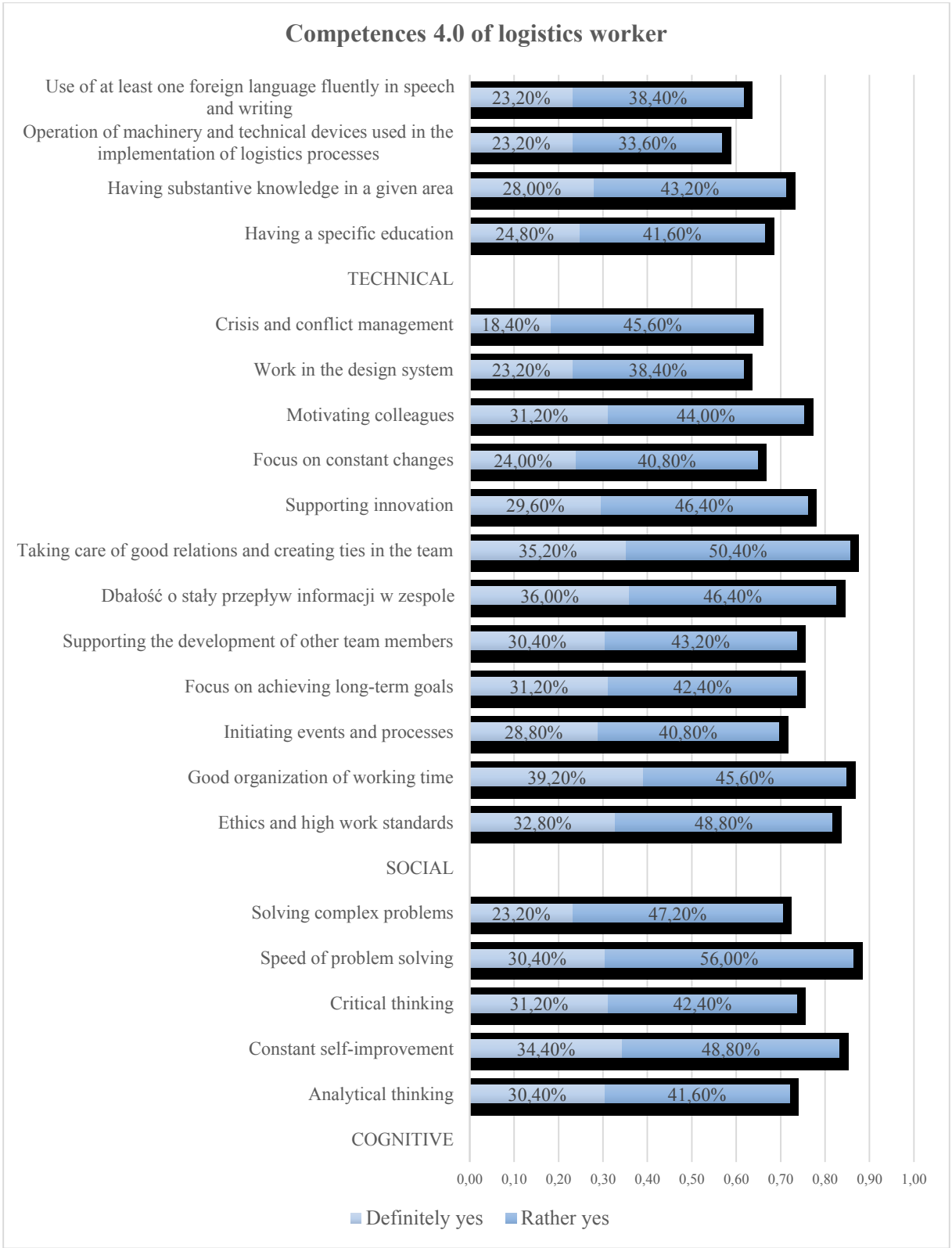

Figure 3. Competences 4.0 of a logistics worker ready for the challenges of the digital economy. Source: own research.

After analyzing the structure of the distribution of responses, a cross-analysis was carried out to determine the possibility of a relationship between the selected variables. The basis at this stage was the contingency table each time, allowing for the juxtaposition of two features at the same time. The table consisted of r rows and s columns each time. Each row and column corresponded to particular variants of the feature X and Y. The content of the contingency table consists of the n_{ij} numbers of sample elements that have the i-th variant of the feature X (i = 1, 2, …, R) and the j-th variant of the feature Y (j = 1, 2, …, s). Each time the contingency table was the basis for the verification of the null hypothesis (H0) of the existence of the potential stochastic independence of random variables X and Y and the alternative hypothesis (H1), adopted in the case of rejecting the null hypothesis (H0) according to the formula (2):

$$\begin{aligned} H_0: &\quad P\{X = x_i \wedge Y = y_j\} = P\{X = x_i\} \quad P\{Y = y_j\} \\ H_1: &\quad P\{X = x_i \wedge Y = y_j\} \neq P\{X = x_i\} \quad P\{Y = y_j\} \end{aligned} \tag{2}$$

The basis for the verification of the H0 hypothesis about the stochastic independence of the variables was the value of the statistics obtained from the formula (3):

$$\chi^2 = \sum_i^r \sum_j^s \frac{(n_{ij} - \tilde{n}_{ij})^2}{\tilde{n}_{ij}} : \chi^2_{(r-1)\cdot(s-1)} \tag{3}$$

where:

n_{ij} – conditional empirical numbers resulting from the contingency table,

$\tilde{n}_{ij}$ – theoretical conditional counts that could appear in the table if the features were independent.

Hypothetical numbers are determined according to the formula (4):

$$\tilde{n}_{ij} = \frac{n_{i\cdot} \cdot n_{\cdot j}}{N} \tag{4}$$

The H0 rejection area is always right-handed. Its size depends on the adopted significance level α. It gets bigger the bigger it is α. It is generally assumed to α <= 0,05. Critical values of the χ2 distribution with (r-1)*(s-1) degrees of freedom. If only χ^2emp > χ^2α than H0 is rejected in favor of the H1 hypothesis, which means that the pair of features is mutually dependent on each other. Using the above methodology, the process of testing the statistical significance of the relationship between the selected variables was carried out on the basis of the SPSS computer program.

When analyzing competences 4.0, broken down into cognitive, social and technical in terms of experience, position held and the area of logistic specialization of the employee, the obtained contingency tables indicated the existence of potential relationships between the selected variables. The verification of the indicated relationships was confirmed by the χ^2 independence

test at the strength of the relationship determined by V-Cramer (Table 1). The analysis shows that the existing dependencies are in most cases weak, but in a few cases they are significant.

Particular characteristics of cognitive competences indicate connections between experience, the position held and the area of specialization. In terms of experience, the most important thing is continuous improvement and analytical thinking. On the other hand, continuous improvement and the speed of problem solving are strongly related to the position held. Likewise, continuous improvement and speed of solving with the area of specialization.

Table 1.
Competence 4.0 of a logistics worker ready for the challenges of the digital economy in terms of experience, position and area of specialization – the χ^2 independence test at the strength of the relationship determined by V-Cramer

	Experience			**Position**			**Specialization area**		
	χ^{2a}	**p[b]**	**V[c]**	**χ^{2a}**	**p[b]**	**V[c]**	**χ^{2a}**	**p[b]**	**V[c]**
Cognitive									
Analytical thinking	87,882	0,001	0,216	130,858	0,001	0,264	136,835	0,001	0,270
Constant self-improvement	120,944	0,001	0,220	695,297	0,001	0,527	454,766	0,001	0,427
Critical thinking	72,130	0,001	0,170	140,722	0,001	0,237	200,340	0,001	0,283
Speed of problem solving	39,174	0,001	0,125	677,757	0,001	0,521	377,792	0,001	0,389
Solving complex problems	45,468	0,001	0,156	154,011	0,001	0,287	163,313	0,001	0,295
Social									
Ethics and high work standards	39,134	0,001	0,125	656,467	0,001	0,512	436,116	0,001	0,418
Good organization of working time	110,114	0,001	0,210	262,567	0,001	0,324	264,534	0,001	0,325
Initiating events and processes	55,717	0,001	0,149	674,323	0,001	0,519	387,936	0,001	0,394
Focus on achieving long-term goals	79,577	0,001	0,206	189,981	0,001	0,318	156,199	0,001	0,289
Supporting the development of other team members	70,136	0,001	0,167	680,612	0,001	0,522	381,290	0,001	0,391
Ensuring a constant flow of information within the team	65,792	0,001	0,162	667, 099	0,001	0,517	381,989	0,001	0,391
Taking care of good relations and creating ties in the team	34,835	0,001	0,137	172,530	0,001	0,303	138,897	0,001	0,272
Supporting innovation	87,983	0,001	0,188	691,022	0,001	0,526	424,702	0,001	0,412
Focus on constant changes	81,665	0,001	0,181	129,090	0,001	0,227	112,000	0,001	0,212
Motivating colleagues	46,988	0,001	0,137	338,465	0,001	0,368	289,166	0,001	0,340
Work in the design system	94,608	0,001	0,195	281,991	0,001	0,336	262,826	0,001	0,324
Crisis and conflict management	37,917	0,001	0,123	416,242	0,001	0,408	295,741	0,001	0,344
Technical									
Having a specific education	161, 006	0,001	0,254	119,358	0,001	0,219	168,026	0,001	0,259
Having substantive knowledge in a given area	148,697	0,001	0,244	700,785	0,001	0,529	392,769	0,001	0,396
Operation of machinery and technical devices used in the implementation of logistics processes	63,350	0,001	0,159	137,026	0,001	0,234	258,008	0,001	0,321
Use of at least one foreign language fluently in speech and writing	76,920	0,001	0,175	300,133	0,001	0,346	299,179	0,001	0,346

[a] χ^2 – test value; [b] p – asymptotic significance; [c] Relationship strength calculated using V-Cramer.

The links between social competences and experience are especially strong in the case of good organization of working time, focus on long-term goals, working in a project system, supporting innovation and focus on constant changes. On the other hand, supporting innovation, supporting the development of other team members, initiating events and processes, taking care of the constant flow of information in the team as well as ethics and high work standards are more closely related to the position held. In the case of logistics specialization, however, there is a connection with ethics and high standards of work, supporting innovation, initiating events and processes, supporting the development of other team members and taking care of the constant flow of information in the team.

The last group of 4.0 competencies that are important in the case of logistics employees are technical competences. The strongest relationship exists between having directional experience and having substantive knowledge in a given area, and experience. Moreover, having substantive knowledge in a given area, using at least one foreign language fluently in speech and writing is related to the position. On the other hand, having substantive knowledge in a given area and using at least one foreign language fluently in speech and writing is related to the area of specialization.

A special group of competences that should be characterized by employees in the 21st century are digital competences, which include IT, informative and functional competences. The respondents state that among IT competences, they can definitely use a computer and other electronic devices (switching on, off, using a mouse and a touch screen) (89.6%), use applications and various software (installation and use of functionalities: downloading the application, installing the application on a mobile device, tracking usage costs, creating files, developing content, saving, searching and organizing) (89.6%) and using the Internet (connecting to a Wi-Fi network, opening a browser, reloading pages , using hotkeys, adding a bookmark, downloading files, privacy settings, file transfer, virus protection, form filling) (88.0%). The smallest number of respondents (65.6%) admitted that they can create digital content (using the right software).

On the other hand, when analyzing the indications in the area of digital competences identified with informative competences, the respondents most often indicated yes and rather yes to searching for information in digital space (82.4%), the assessment of the credibility and usefulness of digital information (82.4%) and the understanding of the content obtained digital information (81.6%).

Figure 3. Digital competences of a logistics worker ready for the challenges of the digital economy. Source: own research.

On the other hand, in the group of digital competences in the functional area, the respondents definitely so and rather so admitted that they can maintain digital relationships with colleagues (76.8%) and are able to obtain digital information from the area in which they work (77.6%). In addition, they take care of acquiring and maintaining relationships with customers using digital tools (74.4%), managing flows and transport using software (70.4%), carrying out digital transactions (70.4%) and using dedicated software in planning, implementation and control of processes (time, resources, costs) (70.4%).

Competences such as corporate image management with the use of digital tools (66.4%), financial flow management with the use of digital solutions (64.8%) and digital scheduling (63.2%) are at a slightly lower level.

After analyzing the structure of the distribution of responses, a cross-analysis was carried out to determine the possibility of a relationship between the selected variables. Similarly to competencies 4.0, the χ^2 test of independence was used with the strength of the relationship determined by V-Cramer (Table 2).

Particular characteristics of IT competences indicate connections between experience, position held and the area of specialization. In terms of experience, the most important is the creation of digital content and the use of applications and various types of software. In turn, the use of a computer and other electronic devices as well as the use of applications and various types of software are strongly related to the position held. On the other hand, the use of the Internet and the use of applications and various types of software are related to the area of specialization.

Table 2.
Competence 4.0 of a logistics worker ready for the challenges of the digital economy in terms of experience, position and area of specialization – the χ^2 independence test at the strength of the relationship determined by V-Cramer

	Experience			**Position**			**Specialization area**		
	χ^{2a}	**p[b]**	**V[c]**	**χ^{2a}**	**p[b]**	**V[c]**	**χ^{2a}**	**p[b]**	**V[c]**
IT									
Using a computer and other electronic devices	38,278	0,001	0,124	448,080	0,001	0,423	257,171	0,001	0,321
Using the Internet	27,556	0,036	0,105	306, 219	0,001	0,350	202,809	0,001	0,285
Using applications and various software	66,291	0,001	0,163	370,080	0,001	0,385	244,398	0,001	0,313
Creating digital content (using the correct software)	80,776	0,001	0,180	177,587	0,001	0,267	168,178	0,001	0,259
Informative									
Searching for information in digital space	33,196	0,007	0,115	237,044	0,001	0,308	212,484	0,001	0,292
Understand the content of acquired digital information	75,338	0,001	0,174	288,790	0,001	0,340	231,036	0,001	0,304
Assessment of the credibility and usefulness of digital information	60,664	0,001	0,156	283,298	0,001	0,337	175,998	0,001	0,265
Functional in logistics									
Maintaining digital relationships with colleagues	15,118	0,516	0,780	279,631	0,001	0,334	186,630	0,001	0,273
Digital scheduling	45,076	0,001	0,134	145,334	0,001	0,241	158,150	0,001	0,252
Using dedicated software in planning, implementation and control of processes (time, resources, costs)	142,420	0,001	0,239	183,962	0,001	0,271	126,651	0,001	0,225
Acquiring and caring for customer relations with the use of digital tools	70,460	0,001	0,168	180,529	0,001	0,269	214,287	0,001	0,293

Cont. table 2.

Fulfillment of digital transactions	57,874	0,001	0,152	229,813	0,001	0,303	144,080	0,001	0,240
Management of flows and transport with the use of software	118,892	0,001	0,218	185,262	0,001	0,272	131, 477	0,001	0,229
Acquiring digital information from the area in which I work	89,171	0,001	0,189	195,318	0,001	0,280	122,844	0,001	0,222
Management of financial flows with the use of digital solutions	80,598	0,001	0,180	87,598	0,001	0,187	187,272	0,001	0,274
Managing the company's image with the use of digital tools	69,589	0,001	0,167	277,888	0,001	0,333	242,677	0,001	0,312

[a] χ^2 – test value; [b] p – asymptotic significance; [c] Relationship strength calculated using V-Cramer.

The links between information competences and experience are especially strong when it comes to understanding the content of the acquired digital information. Similarly, the understanding of the content of the acquired digital information is related to the position held and the area of specialization.

The last group of digital competences that are important in the case of logistics employees are functional competences in logistics. The strongest dependence exists between the employee's use of dedicated software in planning, implementation and control of processes (time, resources, costs), management of flows and transport with the use of software, as well as obtaining digital information in the area in which I work, and experience. In turn, maintaining digital relationships with colleagues, managing the company's image with the use of digital tools, carrying out digital transactions, acquiring digital information in the area in which I work and using dedicated software in planning, implementation and control of processes (time, resources, costs) is related to the position held. On the other hand, acquiring and caring for customer relationships with the use of digital tools, managing financial flows with the use of digital solutions, maintaining digital relationships with colleagues and digital scheduling related to the specialization area in which the employee performs their tasks.

The respondents admit that they are aware that the current competences should be strengthened. Definitely yes and rather yes (84.8%) declare that they are ready to acquire new competences or complete retraining due to the change of the nature of work due to the influence of new technologies. Only every tenth respondent (12.8%) is undecided on this issue. The respondents most often pointed to the improvement of competences in the field of solving technical problems with the use of software (80.8%), handling new software (79.2%), using IT tools in teamwork (76.8%), searching for information and analyzing data (76.0%), data visualization (69.6%), and programming (60.0%).

In summary, the computer revolution in recent years has transformed the world in which the company and its employees exist. The changes affected the functioning of economies, industries, individual enterprises and citizens. The emanation of these changes is the necessity for employees to have competences referred to as competences 4.0. It is these cognitive, social, technical and digital competences, especially IT, informative and functionally related to

logistics, that will allow employees to follow the current of changes and find themselves in the future. The analysis shows that employees declare that they have competences from the 4.0 trend. This state of affairs is a derivative of the experience, position and area of expertise in the field of logistics in which the respondents work. These links could be strengthened. The respondents are aware of this and express their willingness to strengthen them.

7. Summary

The intensity of digitization accelerates the "pulse" of multiplicative socio-economic changes, including logistics. Business models are being reconfigured. Customerization, networking and technologization are becoming a trigger that signals changes in logistics. In line with the new trend, the demand for logistics employees with the desired amount of knowledge and experience as well as competences referred to as 4.0 competences is growing. The relationship between the possible business success of logistics companies and the functioning of their employees is visible as never before. Currently, an employee in logistics is not only a passive contractor of commissioned tasks, but becomes a co-creator responsible for the development of the company.

Due to the fact that digitization contributes to the creation of a new type of interaction between people and machines, the necessary condition is to have 4.0 competences. Especially those that distinguish human work from the work of information systems, robots or artificial intelligence. As human will still be difficult to replace in these areas, they have been referred to as the competences of the future. There has never been a better moment for employees with the right competencies, i.e. competencies 4.0.

Therefore, as the results of the research conducted by the authors show, it is important that the employee is substantive, able to work in a team and efficiently use the technical infrastructure and software. Self-improvement, problem-solving speed and critical thinking are extremely useful in the case of logistics employees, which determine the speed and efficiency of receiving and analyzing information by employees. On the other hand, caring for good relationships and creating ties in the team, good organization of working time and attention to the constant flow of information in the team make collaborative employees more effective. By adding a component of technical competences in the form of substantive knowledge in the field of logistics, the use of devices, including computers, applications and the Internet, we can submit a full competency profile of an employee 4.0. An employee who can search for information in digital space, evaluate it in terms of credibility and usefulness, and can acquire and maintain relationships with other employees and customers, manage flows, and plan, implement and control processes using digital instruments for this purpose.

The above arguments allowed to positively verify the hypothesis: "In the era of economy 4.0 and the upcoming economy 5.0, a logistics employee should be distinguished by competences 4.0 identified with the emanation of cognitive, social and technical competences, which enable him to act openly, flexible, efficient and effective in the context of social and economic networking".

Summing up, digital revolutionizes, remodeluces and recalibrates the present day. In the labor market shaped by the processes of automation and platformization, there will be such employees who, based on advanced cognitive, social and technical competences (including digital ones), will be able to adjust the profile of their skills to the rapidly changing expectations of employers. On the other hand, the time is coming for those companies that will appreciate and care for their logistics employees. It is their knowledge, experience, skills and competences 4.0 that will allow in the future to increase competitiveness, develop and achieve business success, in line with the motto: "Primo – people, secundo – processes and tertio – technology". That could be the effect of sustainable digital transformation.

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