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HUMAN RESOURCES MANAGEMENT IN AUTOMOTIVE SUPPLY CHAINS IN THE TIME OF THE FOURTH INDUSTRIAL REVOLUTION

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Purpose: The purpose of this paper is to explore the challenges and opportunities of managing a multi-generational workforce within cooperative enterprises undergoing digital transformation. The research aims to identify universal principles and suitable management methods that can be applied in organisations operating in the context of technological change, especially within the automotive supply chain. Special attention is given to bridging the digital competence gap among older employees and enhancing the relational competencies of younger generations.
Design/methodology/approach: This study adopts a mixed-methods approach combining literature review and empirical research. The theoretical framework is grounded in contemporary human resource management theories, generational theory, and digital transformation literature. The empirical part includes qualitative and quantitative analysis focused on multigenerational workforces across different levels of the automotive supply chain. The study identifies digital competence disparities and investigates how tailored management methods can address generational differences in digital skills and workplace expectations.
Findings: The research revealed significant differences in digital competences across generations, with older employees often facing challenges in adapting to new technologies, while younger employees demonstrate lower levels of relational and organisational loyalty. The findings suggest that successful human resource management in this context requires adaptive leadership, personalised development strategies, and intergenerational knowledge-sharing practices. The study provides a set of recommended management instruments aimed at enhancing digital inclusion and intergenerational cooperation.
Research limitations/implications: This research is limited in its scope to cooperative enterprises, primarily within the automotive sector, and may not fully generalise to other industries. Further research could expand the study to include non-cooperative or global corporations and apply longitudinal methods to assess the long-term effectiveness of the proposed management practices.
Practical implications: The study offers practical recommendations for managers of cooperative organisations on how to adapt HR practices to the needs of multigenerational teams. This includes designing training programs tailored to age-specific needs, promoting digital mentoring, and creating inclusive organisational cultures. The results can contribute to

increased employee satisfaction, productivity, and reduced generational conflict in digitally transforming workplaces.
Social implications: The paper highlights the importance of inclusive digital transformation and intergenerational solidarity in the workplace. By fostering mutual understanding and reducing digital exclusion among older employees, the research supports broader social goals such as social cohesion, active ageing, and responsible digital development. These practices can inform policies on workforce inclusion and generational equity.
Originality/value: This paper provides original insights into the intersection of generational diversity, digital transformation, and cooperative enterprise management. It offers a unique perspective by addressing management practices specifically tailored for multi-generational teams within cooperative structures and supply chains, contributing to both academic literature and managerial practice. The paper is intended for HR professionals, cooperative managers, policymakers, and scholars in organisational studies.
Keywords: multigenerational workforce, digital transformation, cooperative enterprises, human resource management, intergenerational management.
Category of the paper: Research paper.

Introduction

The reason for writing this article is the identified research gap in recommending methods for managing human resources in the era of the fourth industrial revolution. In order to identify the research gap, a review of recent global literature (publications from 2017-2024) focused on competencies 4.0 of a multigenerational and multicultural workforce was conducted. The surveyed literature on HR management in the era of the fourth industrial revolution is mainly concerned with the contexts of HR and technology implementation, change management in a transitioning company. Meanwhile, there is a dearth of publications on supporting managers during the challenging period of digital transformation of companies and their supply chains. Recognising this literature gap, the research sought to answer the questions:

- What management methods to recommend in a multigenerational work environment in the era of the fourth industrial revolution?
- What management methods to recommend in a multicultural (combining the cultures of multiple organisations working together in a supply chain) work environment in the era of the fourth industrial revolution?

The literature study provided an overview of selected management methods: - the identification of the strengths and weaknesses of these methods applied in organisations undergoing digital transformation (the strengths and weaknesses of these methods were identified in the context of managing the workforce of generations: X, Y, Z); - identification of the strengths and weaknesses of these methods applied in organisations undergoing digital transformation (the strengths and weaknesses of these methods were identified in the context of personnel management at different levels of supply chains). After the literature analysis,

it was confirmed that there is generational and cultural diversity. Confidence was gained that a manager needs to take generational and cultural diversity into account through the use of preferred management methods.

In carrying out the self-study, the research question was again posed, namely: What management methods to recommend in a multigenerational work environment in the era of the fourth industrial revolution? What management methods to recommend in a multicultural work environment in the era of the fourth industrial revolution? The research objective was to identify the differences arising from the digital competences of different generations, which are highlighted in companies belonging to supply chains undergoing digital transformation.

The aim of the application was to try to match methods and instruments that would support managers in managing human resources from different generations, but also from different organisations. Particular attention was paid to recommending management methods and instruments that compensate for digital competence gaps in older generations and relational competence gaps in younger generations. Two research hypotheses were put forward:

1. Generational diversity concerns mainly digital and relational competences.
2. A manager can use known management methods with new instruments to effectively compensate for identified competence gaps.

Literature review

The chapter entitled ‘Literature review’ contains a systematic review of the literature. A systematic literature review is a method of integrating research evidence that uses explicit methods to identify, select, critically appraise and analyse data from relevant studies qualified for review. The literature for the review was categorised according to keywords, i.e. human resource management, management methods, multigenerational workforce, multicultural/ interorganisational workforce, digital transformation. Evidence was selected that demonstrates the feasibility of using the selected methods to manage a multigenerational and multicultural workforce. The literature reviewed systematically was published over a period of many years, i.e. from 1987 to 2024. Such a period of time confirms the utilitarian nature of the management methods described, but also the universal principles that should guide a manager managing a multigenerational and multicultural (from different cooperating organisations) workforce in times of difficult economic transition.

A Technologies introduced into the business processes of enterprises require new predispositions and skills from human resources. Selected literature studies have analyzed the key dimensions: education and qualifications of employees (Benesova et al., 2017); key employee skills required of workers in the era of the fourth industrial revolution. In addition to the need for competence in digitization, AI, robotics and big data (Sima et al., 2020),

soft skills (Pejic-Bach et al., 2020), a disposition for continuous training (Flores et al., 2020) and flexibility and a collaborative attitude (Matt et al., 2020) are essential. Some studies have looked at the relationship between social trends and Industry 4.0 technologies (Bednar, Welch, 2020). Researchers have highlighted the changing demographics of the workforce in the context of Industry 4 challenges (Calzavara et al., 2020; Javaid, Haleem, 2020). The researchers, seeing that the demographics of the workforce are changing (there is a general aging of the population and a higher average age of the workforce worldwide), found it worthwhile to study the relocation and distribution of work (remote and smart work) in this context (Calzavara et al., 2020; Garay-Rondero, Martinez-Flores, Smith, Caballero Morales, Aldrette-Malacara, 2020).

Other works have emphasized that the introduction of Industry 4.0 systems and technologies entails opportunities and pitfalls for organizations and management (Benesova, Tupa, 2017; Nahavandi, 2019; Xu et al., 2021). Like any transition to a new production paradigm, a new organization of business processes, leadership styles and personnel management methods is required. Educating and qualifying managers (Benesova et al., 2017); managing human-machine interaction, i.e., the connections between the mind of a (human) worker and the (artificial) intelligence of robots to increase collaboration and reduce competition is a new challenge for managers (Nahavandi, 2019; Xu et al., 2021). Extreme connectivity between organizations, employees, workers and robots in a digitized organization creates new social power structures. Existing management methods, may no longer be acceptable in digitally transformed enterprises, may lead to various personnel problems, authoritarian rule by one person. Researchers say that new management methods should be proposed in the social sciences and humanities for effective and efficient implementations of Industry 4.0 and 5.0 technologies (Dezi et al., 2018; Ozdemir, 2018) especially in multi-generational environments.

Management methods used in multigenerational work environments in the era of digital transformation.

Management by communication – Essence of the method

The main features of this method are: exposure (in the organisational structure of cooperating companies) of positions and cells oriented to information and communication processes; use of a rich spectrum of different methods and means of information and communication; improvement of information and management processes leading to the improvement of the existing information and communication system in the supply chain. The method implies personalised information for employees of different organisations (operating in the supply chain) and who are at different levels (from the highest - the board of directors and company management, through functional department managers, to specialist positions in different fields). Significant emphasis is also placed on the use of information technology as a tool to support the implementation of management by information and communication (Durach, Machuca, 2018). Personal communication is the driving force behind supply chain integration (Wang, Kang, Childerhouse, Huo, 2018).

- Communication barriers of generation X; Communication expectations of generation X

In the process of creating the right communication environment with Generation X, the manager should pay attention to the fact that their representatives value direct 'face-to-face' contact much more. Personal attachment, personal credibility and personal communication influence the integration of collaborators in the supply chain (Wang, Kang, Childerhouse, Huo, 2018). Therefore, information exchange via instant messaging may not be effective (Wasylewicz, 2016). However, this does not mean that X are completely closed to new technologies. Phone calls and emails are acceptable, but should not dominate during active meetings. Email is an effective form of information exchange. Sharing information via social media can make X feel uncomfortable and distracted (Rogulska, 2018).

- Communication barriers of generation Y; Communication expectations of generation Y

Generation Y is one of those generations that value face-to-face contact, but are equally keen to use modern forms of remote communication. Generation Y values a good atmosphere at work. They function much better in flat organisational structures that allow freedom of communication between employees of cooperating companies. Communicating praise has a positive effect on Y. They take criticism less well, so every effort should be made to ensure that communicating mistakes does not cause them stress. Y are advocates of feedback. Managers can use IT tools, such as collaboration platforms, while maintaining attention to trust and openness.

- Communication barriers of generation Z; Communication expectations of generation Z

Managers increasingly perceive a problem with building an appropriate channel for exchanging information with Generation Z employees. Deficits in telephone communication affect the reduced level of satisfaction with duties performed to improve supply chain flows. Generation Z, on the other hand, is perfectly comfortable using inter-organisational instant messaging, where everything can be communicated to everyone. Quick feedback from IT systems and rapid data collection via AI is preferred by Generation Z. Young people also appreciate being able to communicate in a way that is relevant to their trends in language, words etc. Therefore, it is worth trying to delve into the topic of phrases, to create a conducive environment for professional communication (Sulyma, 2022).

Management by delegation – essence of the method

Management by delegation should be properly defined as the delegation of authority, duties and responsibilities (Niemczyk, 2000) and should be classified as a method for motivating employees. The essence of delegation of authority is the transfer of specific decision-making capacities together with the burden of these decisions from the supply chain management agency to employees of other cooperating organisations (Partyka, 2022). When observing the work carried out by agency managers, it can often be seen that the number of tasks assigned to them can cause numerous overloads due to the temporal overlap of individual responsibilities. The accumulation of such a number of activities to be carried out can negatively affect productivity and the achievement of positive supply chain results. By delegating tasks to

employees of cooperating organisations, trust is simultaneously shown. This builds the employees' sense of worth and increases their willingness to cooperate. It allows the employee to identify with the results of the project and builds awareness that the role played in the implementation of a particular project was important for the proper functioning of the supply chain (Timescu-Dumitrescu, 2019).

- Effective delegation to generation X

Employees belonging to Generation X highly value the role of agency in the supply chain (Fayezi, O'Loughlin and Zutshi, 2012) and the opportunity to make independent decisions. They want to have a say in the final implementation of tasks. For this reason, the delegation process itself should be set up in a way that allows active participation in decisions related to delegated responsibilities. X like to feel responsible for tasks. In the delegation process for Generation X, it is also important to consider the possibility of adapting the schedule of delegated work to individual preferences. The need for flexibility in their approach to responsibilities will affect their effectiveness and satisfaction with their delegated work (Kronke, 2015).

- Effective delegation to generation Y

Generation Y are very good candidates for delegating tasks to be performed in inter-organisational teams. For them, interacting with other employees on projects is an opportunity to exchange knowledge, gain new experiences and develop interpersonal skills. The process of delegation should be closely linked to opportunities to promote supply chain improvement activities. Delegation from agencies should include regular feedback to enable them to track progress, understand what they are doing well and what they can still improve. Specific messages reflecting perceptions of their work will stimulate their engagement and ongoing professional development. They are digital natives, which means they are very familiar with modern communication tools. It makes sense to use new technologies in the delegation process, taking into account their preference for using modern platforms, apps or tools for effective communication and delegation (Kronke, 2015).

- Effective delegation of tasks to generation Z

Delegating responsibility for a task should be communicated in an appropriate way so that the employee understands its context and purpose. Coding the delegated task will be easier for the young employee if every little detail is explained to them. The explanation should include information such as how to perform the task, the purpose of the task, the idea of the final result. It is advisable to systematically consult the results of each stage of the activity, as feedback is very important for generation Z. When performing a duty, it is important to listen to their dilemmas or suggestions that they think should improve the whole process. Creating a space to express the employee's thoughts and suggestions creates an attractive working environment for Z. In addition to paying attention to the above-mentioned aspects of effective delegation, modern communicators should be used. An interesting way to make employees more effective is to set a deadline that is embedded in a specific time. It is necessary for the manager to make

sure that the employee understands what needs to be done. To do this, the employee can be encouraged to provide their interpretation of the task received. When the implementation of the instruction is successful, the agency manager should reward those involved, using, for example, verbal praise and celebration of success (Zubelewicz, Kardasz, 2017).

Management by motivation – essence of the method

Management by motivation aims to make employees perform tasks under the influence of various incentives. There are many different approaches and ways to motivate employees, such as rewards, employee evaluations and punishment systems. It is also important to understand the needs and goals of employees and to create an appropriate motivational system. The effectiveness of motivation systems in companies but also in supply chains depends on the values and preferences of employees (Gellerman, 1968; Birou, Hoek, 2022). Satisfying the motivational needs of employees is a difficult task for managers of super organisations (Fantozzi, Di Luozzo, Schiraldi, 2024). It is important to remember that the employee of each supply chain organisation may respond differently to motivational incentives, which often becomes a test of managerial creativity. An incentive system for the entire supply chain workforce requires the identification of a set of soft skills and capabilities that determine success in the chosen industry. The identified soft skills and capabilities can help to develop specific motivators for individual jobs.

- Supporting the development of Generation X through management by motivation

Generation X is characterised by specific values and soft skills that influence their approach to work, relationships. X are loyal employees who identify with the company and supply chain they work for (Syper-Jędrzejak, 2014). Managers should focus on building and nurturing a supply chain community, developing programmes to encourage inter-organisational collaboration, organising team-building events or offering opportunities to share generational and intergenerational experiences. This generation needs to be motivated by declaring their contribution to supply chain teamwork. Rewarding individuals and teams for their contribution to supply chain integration can increase engagement and also create an atmosphere where everyone feels important. In addition, recognising employee engagement through rewards increases commitment (Smolbik- Jęczmień, Żarczyńska-Dobiesz, 2017).

- Supporting the development of generation Y through management by motivation

For Generation Y people, maintaining a work-life balance is crucial. They tend to take on tasks that give them satisfaction and allow them to achieve their goals. At the centre of their motivation are primarily intangible incentives (Syper-Jedrzejczak, 2014). By offering flexible work options, such as remote working or flexible working hours, representatives of generation Y can better manage their time and personal lives, which increases their motivation to perform their professional duties. By allowing this generation to choose more flexible tasks, tailored to individual skills and preferences, employers can achieve greater productivity. Creating a work environment where employees can focus on cross-organisational projects can significantly increase engagement. Investment in professional development, including training, mentoring

and career development programmes, can be a strong source of motivation for Generation Y (Smolbik-Jęczmień, Żarczyńska-Dobiesz, 2017).

- Supporting the development of Generation Z in the application of management by motivation

The use of coaching methodologies in the supply chain makes it possible to help employees increase their productivity and support them to work cooperatively. Generation Z focuses on skills and developmental outcomes. They value scheduled sessions with an expert, as well as supportive conversations. Conversations are seen as a way to cope with robotisation, organisational change and uncertainty (Gran, 2016). Mentoring provides an opportunity to pass on skills and knowledge acquired by a more experienced expert. The mentor is a role model for generation Z and helps to directly diagnose emerging issues (Connor, Pokora, 2017). Mentoring is a form of motivation for generation Z. An external counsellor can be engaged to improve supply chain performance. Psychological counselling is increasingly needed to provide support in stressful situations and for developmental progress (Mcleod, Henderson, 2003).

Management by delegation of authority and controlling – essence of the method

Controlling is an effective management method. The instruments adopted in controlling (e.g. KPIs) improve management. The use of controlling solutions is possible thanks to the data collected, transformed into information. Based on the information, strategic, tactical and operational plans are built. Employees performing assigned tasks and meeting KPIs are also controlled (Fantozzi, Di Luozzo, Schiraldi, 2024). The employee should act according to set standards, but in order for the manager to be sure that the action is performed, he or she exercises control (Dědečková, 2020). Control also serves the employee by giving a sense of correctly performed tasks. Controlling the correctness of tasks complemented by controlling other parameters, such as time, influences the evaluation of the employee. Control and evaluation can become a source of inspiration to perform assigned tasks more conscientiously and be a source of satisfaction with tasks well performed (in the case of positive performance evaluation). Controlling intellectual capital in the supply chain contributes to improving supply chain performance supports seamless chain integration (Mubarik and Khan 2024). The authors argue and argue that supply chain management by controlling human labour is a strategic component when implementing and operating a supply chain.

- Redesigning the control process for generation X

The importance of autonomy and independence at work is evident for Generation X. Generation X representatives have a relaxed approach to carrying out their duties, which allows them to approach tasks individually and make decisions independently. As such, they require a flexible approach to tracking progress. They prefer to work in a way that allows them to manage their time and tasks according to their preferences. When assessing their performance, it is useful to maintain clear standards and benchmarks (e.g. KPIs) that can motivate them to achieve their goals. In addition, periodic appraisal meetings, provide an opportunity to discuss progress, set new goals and receive constructive feedback (Wasylewicz, 2016). For Generation

X, finding a balance between autonomy and support from collaborating organisations is crucial. Flexible forms of monitoring, performance appraisals and developmental conversations create a holistic approach that suits their preferences and promotes productivity and professional development.

- Redesigning the control process for generation Y

Employees of the Millenial - Y generation expect continuous feedback as part of their ongoing supply chain development efforts. By receiving regular feedback on performance, they can adjust their results, respond quickly to changes and achieve their goals. However, in addition to feedback, it is important to recognise their contribution to achieving the goals of the organisation and the supply chain they work for. Recognising them as key players in the success of the company is a great motivator and increases their value. Periodic progress monitoring is another factor that this generation values. Millenials prefer a variety of performance appraisal tools and methods, from traditional meetings to digital tools that allow them to tailor the appraisal process to their needs and work style (Gadomska-Lila, 2015).

- Redesigning the control process for generation Z

When undertaking review activities, it is important to remember that they will be linked to the employee's expectations (feedback expectations). The younger generation feels more engaged if the control ends with specific feedback on whether they are satisfied or dissatisfied with their work, allowing them to make changes/improvements. Therefore, KPIs may not be sufficient for this generation. Generation Z is waiting for a detailed answer on what needs to be changed in the supply chain and how to avoid the risks of the future (Swierkosz-Hołysz, 2016). The feedback message must bluntly represent the manager's intention. Communicate the message in a sincere and concrete way, referring only to the behaviour in question and not personally (Niermeyer, 2009).

Management by objectives – essence of the method

Management by objectives is a method of building a coherent set of objectives for all cells and collaborating organisations and assessing the level of achievement (Carrolls, 1978). The assumption is that the supervisor and his subordinates agree on objectives that will be valid for a certain period of time. And in a supply chain, its links agree on the chosen objectives. Co-creation of objectives in the supply chain can bring many benefits. The maturity of supply chain management means that goals are set for the implementation of Industry 4.0, environmental management and product management (Vasconcelos, Sigahi, TFAC, Pinto, Rampasso, Anholon, 2023). An employee who is made aware of supply chain objectives feels responsible for achieving them. Knowledge of the objectives exerts additional motivation and focus on the tasks to be performed. An employee involved in planning shows integrity and ambition (Thomson, 1998).

- Goal setting for generation X

Generation X values the opportunity to shape their own career path, which means that supply chain goals should be transposed to their individual career aspirations. The goal-setting process for Generation X should take into account their need for autonomy and self-reliance. Goals that elicit the commitment of Generation X are those that allow them to develop their individual skills, allow them to gain experience, and at the same time are in line with the overall goals of the super-organisation. The goal-setting process requires open communication and dialogue, in which employees have the opportunity to express their personal opinions and career goals, and the organisation can flexibly adjust its expectations. Flexibility in achieving goals is a key aspect for Generation X. They want to know the methods and deadlines for achieving goals that fit into their work pace and personal lives. Employees of this generation value the ability to decide how and when they achieve goals (Smolbik-Jęczmień, 2013).

- Building an organisation's goals and personal development plan for Generation Y employees

Generation Y is one of those individuals who focus on the pursuit of achievement, satisfying results and setting ambitious goals (Warwas, Wiktorowicz, Jawor-Joniewicz, 2018). An individual development plan for employee Y is closely linked to the identification of specific development goals, the preparation of a schedule that includes a series of training courses that provide opportunities to acquire knowledge and skills that are attractive in the workplace. The schedule allows for the identification of individual goals and their achievement through consistency with company and supply chain objectives (United States Nuclear Commission, 2008). During the initial phase, strengths, interests, inspirations and development paths should be identified. The manager should focus attention on activities and behaviours that determine the willingness to commit to the company's goals. The next step should be to identify competences and skills based on work experience and acquired knowledge. An employee's career path developed in this way will contribute to the success of the organisation and the entire supply chain. Discussing and analysing company/supply chain performance in the context of employee development is the essence of management by objectives for generation Y.

- The use of gamification in achieving goals by generation Z

An interesting solution to increase employee involvement in supply chain development is so-called gamification. This tool is not related to the use of computer games, but to the use of mechanisms specific to games. Gamification causes the employee to achieve goals in an interesting way, without causing competitive stress. This tool is particularly recommended for managing the goals of staff in departments such as purchasing, warehouses (Khan, Kumar, Singh, Ashraf, 2024). Clear feedback on performance and visualisation of results is highly valued by young people. In addition, with high performance, the player/employee can expect a reward, which in turn builds their confidence and self-esteem. Using gamification, employee behaviour can be targeted. Scoring can be used in evaluation, in which optimising supply chain

processes will be rewarded. Generation Z expects to organise competitions with rankings, picking winners, culminating in bonuses (which can be organised collectively for selected employees across the supply chain).

Managing with organisational culture – the essence of the method

The success and broader performance of supply chain activities depend not only on the managerial skills of the management and the material and financial resources available. They also depend on the hard-to-define atmosphere, style of behaviour, development history of the cooperating companies, their technical level, management style, demographic and psychological characteristics of the employees, adopted patterns of behaviour, and together they form what we call organisational culture. Considerations by many authors have shown that organisational culture results from the management method used (Kinar, 2022). Organisational culture is built by the values that guide the manager. Organisational culture sets the standards for quality performance and ethical behaviour. Any attempt to modify or change the organisational culture becomes an opportunity for supply chain development (Davis, Dolson, 2018). Executives have a decisive influence on the development of organisational culture, as every managerial action, gesture and attitude is closely observed by employees (Zanon, Sigahi, Anholon, Carpinetti, 2024).

- Important elements of organisational culture for generations X, Y, Z

Given how different each generation is, one could put forward the theory that this diversity will also be evident in the importance of organisational culture. Each generation has experienced different social, cultural, political, etc. situations that have become decisive factors in shaping their worldview, values and needs for their working life. However, it turns out that despite so many differences, there is something that unites each generation. Empirical research shows that, regardless of the age of the respondents, they shared a common opinion that the best choice for their personal beliefs is the so-called clan culture (Wziątek-Staśko, 2019). By obtaining such data, it can be concluded that every employee, regardless of age and experience, needs to be in a place with a familial and friendly atmosphere, focused on the common achievement of set goals. In a clan culture, team activities are paramount. Where there is cooperation, people feel valued (Wyrwicka, 2014). Issues of loyalty, trust and building shared prosperity are important to people (Kot, 2016). Supply chain researchers deconstruct the organisational culture of individual organisations into key elements and provide directives for action plans for improvement (Zanon, Sigahi, Anholon, Carpinetti 2024). They provide example applications to guide and promote the application of a coherent organisational culture for the supply chain. One should consider whether such applications should be prepared with the differing generations X, Y, Z in mind.

Research methodology

The next chapter, 'Research results', presents the results of secondary (i.e. prepared by the research organisations) and primary (i.e. collected through a prepared questionnaire) data research. The secondary data research (prepared by the European Commission, Digital Economy and Social Index 2020) showed generational differences in digital competences across countries, industries, professions, generations. When conducting the primary research for this article, it was determined that the subjects of the research would only be professionals from different generations working in companies in the automotive industry. It is worth mentioning that specialists coming from companies belonging to supply chains, (being at different levels of supply chains) were studied. The professionals were selected using the quota selection method. This means that they had to meet criteria in order to be included in the study (their job title had to be ds.... specialist, they had to be employed in an automotive industrial company, they had to specify whether they were a first, second...tier supplier). Quota selection in this study meant that specialists from all generations X, Y, Z were surveyed in numbers proportional to the total number of employees in the labour market. However, in the end, after setting the sample size at 150 people, it was decided to keep the same number of respondents in the groups belonging to generations X (50 people), Y (50 people), Z. The research method was statistical. The research technique was a survey, the research tool a prepared survey questionnaire. The questionnaire was distributed via the google portal (https://www.google.pl/intl/pl/forms/about/). The preparation of the research tool was dictated by the aim of the study, which was to identify the differences arising from the digital competences of the different generations that are highlighted in companies undergoing digital transformation. In preparing the survey tool, an attempt was made to confirm the assumptions that: 'generational diversity is mainly about digital and relational competences' and "the manager can use familiar management methods with new instruments to effectively compensate for identified competence gaps". The data collection lasted from May to June 2024. The analysis of the collected data is presented in chapter: Research findings.

Research results

The following charts show that in the working environment of many EU countries, a digital competence gap of cadres is emerging compared to the cadres of the countries - leaders of the ranking. Figure 1 shows the Ranking of EU countries according to the Digital Economy and Digital Society Index (DESI, 2000).

Table 1.
Legend for figure 1

	Communication		Human capital		Use of digital technologies		Use of digital technologies		Digital public services

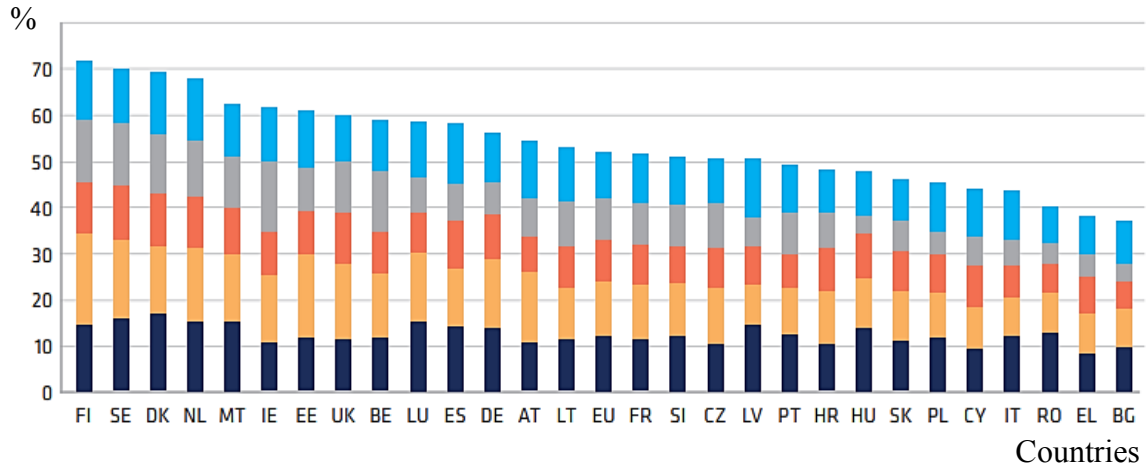

Figure 1. Ranking of EU countries according to the digital economy and digital society index (DESI, 2000).

Source: the European Commission, Digital Economy and Social Index (DESI, 2020), https://arp.pl/documents/41/Kompetencje_cyfrowe_ARP_part_I.pdf

Figure 2 shows the assessment of digital competence of residents in the European Union countries.

	defect		basic		low		higher

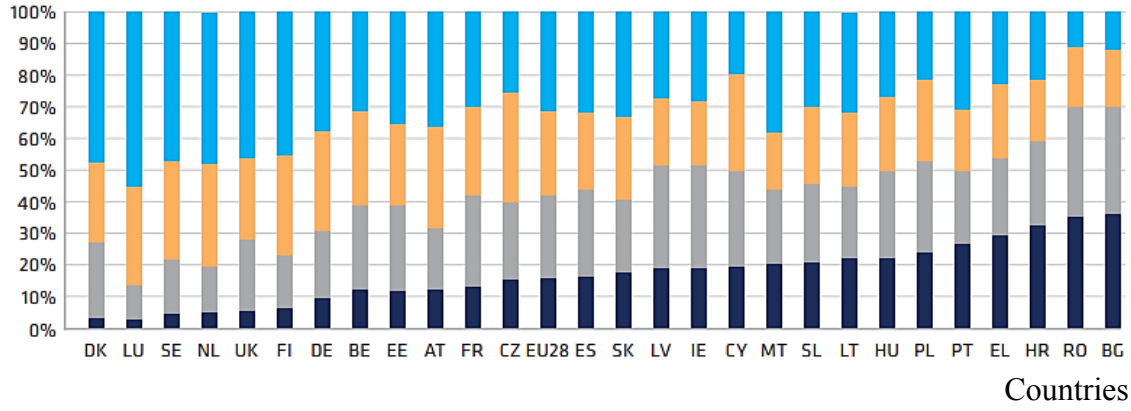

Figure 2. Assesses the digital competence of residents in the European Union countries.

Source: the European Commission, Digital Economy and Social Index (DESI, 2019), https://arp.pl/documents/41/Kompetencje_cyfrowe_ARP_part_I.pdf

Table 2 shows the assessment of digital competence of EU employees of selected professions by level of competence.

Table 2.
Evaluation of digital competencies of EU employees of selected professions (by level of competence)

Occupation performed	Competence level	Percentage of employees (%)
Manager	Basic	8.3
	Advanced	18.7
	Specialized	23.3
Specialist	Basic	38.4
	Advanced	8.9
	Specialized	10.3
Technican	Basic	40.5
	Advanced	9.8
	Specialized	11.8
Office worker	Basic	56.8
	Advanced	13.2
	Specialized	14.1
Machine operator	Basic	27.5
	Advanced	7.1
	Specialized	4.7
Worker	Basic	35.1
	Advanced	7.5
	Specialized	5.7

Source: the European Commission, Digital Economy and Social Index (DESI, 2016), https://arp.pl/documents/41/Kompetencje_cyfrowe_ARP_part_I.pdf

The evaluation of the competence of industrial enterprise specialists by level of sophistication shows that 38.4 percent of them declare basic digital competence, only 10.3 percent of specialists evaluate their digital competence as specialized.

Table 3 shows the evaluation of digital competencies of Polish residents against the EU in age ranges.

Table 3.
Assessment of digital competencies of Polish residents against the EU in age brackets

Age range (years)	Digital competences (%)					
	Low		Basic		Specialized	
	EU	PL	EU	PL	EU	PL
16-24	15	14	25	37	57	48
25-34	21	23	29	38	46	35
35-44	27	37	29	30	36	24
45-54	30	39	29	22	27	11
55-64	31	31	25	14	16	5
65-77	26	20	18	6	7	2
Total populations	26	28	26	25	31	21

Source: the European Commission, Digital Economy and Social Index (DESI, 2016), https://arp.pl/documents/41/Kompetencje_cyfrowe_ARP_part_I.pdf

The table presented does not show an assessment of the digital competence of professionals employed by industrial companies by generational groups. However, the population data presented in the table confirms quite a disparity in the digital competencies of different age groups.

The following Table 4 presents the qualifications and skills important from the point of view of an Industry 4.0 employee.

Table 4.
Qualifications and skills important from the point of view of an Industry 4.0 worker

Knowledge of information and communication technologies	Ability to work with data
• Basic IT knowledge • Ability to use and interact with intelligent machines • Understanding of machine-to-machine communications, data protection and cybersecurity	• Ability to process and analyze data received from machines • Understanding of data entry, visualization and decision making processes • Basic knowledge of statistics
Know-how	Personal skills
• Interdisciplinary and generic knowledge of technologies • Specialized and generic knowledge of factory operations and production processes • Technical know-how about the machines necessary to operate them	• Ability to adapt in the workplace and readiness for change • Ability to work in a team and willingness to share knowledge • The ability to change the way of thinking under the influence of sciencc

Source: Aulbur, Arvind, 2016, p. 123.

A study of the literature (Stawiarska et al., 2019, 2021, 2024) made it possible to prepare Table 5. Table 5 groups the competencies of the 4.0 specialist employee so that the manager can support/develop them using specific management methods.

Table 5.
Management methods, and developing new competencies of the employee

Management method by:	**Qualifications and skills important from the point of view of an Industry 4.0 employee and developed by the management method**
communicating	• communication competences using instant messengers • the ability to use and interact with computers and intelligent machines • data protection and cybersecurity understanding/skills
motivating	• ability to adapt in the workplace and plan development in the context of digital transformation • readiness for changes regarding digital transformation / involvement in the digital transformation process • creativity in implementing increasingly better digital solutions
delegation of authority and controlling	• interdisciplinary and generic knowledge of technologies and know-how about machines necessary to operate them • specialized and generic knowledge of factory operations and production processes • ability to make decisions regarding digital transformations
goals	• ability to analyze and process data received from machines • ability to enter visualization data and make decisions based on data • generic knowledge of business statistics
building organizational culture	• ability to adapt in the workplace and readiness for change • ability to work in a team and willingness to share knowledge • the ability to change the way of thinking under the influence of science

Source: own study.

The following takes a closer look at each of the management methods, attempts to identify new 4.0 instrumentation that can support the chosen method, and presents the results of our own research (based on primary data obtained through a questionnaire).

Management by communication – Essence of the method in the era of Industry 4.0

In the era of Industry 4.0, an important emphasis in the application of this method is the use of ITC as a tool to support communication, data generation and processing, work scheduling and performance measurement (Wang, Kang, Childerhouse, Huo, 2018). New competencies

(relevant to supply chain integration) developed using this method (using modern ITC technology tools) are:

- communication competence using instant messaging,
- the ability to use and interact with computers and smart machines,
- understanding/skills regarding data protection and cyber security.

The results of the self-assessment of the specialists - employees of industrial companies in the automotive sector are presented in Tables 6-8.

Table 6.
Results of the self-assessment of specialists - employees of industrial enterprises in the automotive sector with regard to communication competences using instant messaging

How do you assess your communication competences using instant messengers?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	20	1	3	1	0
Advanced	2	18	2	39	2	5
Specialized	3	12	3	8	3	45
Weighted arithmetic mean	1,84		2,1		2,9	

Table 7.
Self-assessment results of specialists – employees of industrial enterprises in the automotive industry in terms of skills in operating computers and intelligent machines and the ability to cooperate with them

How would you rate your ability to use and interact with computers and intelligent machines?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	11	1	18	1	30
Advanced	2	23	2	19	2	15
Specjalized	3	16	3	13	3	5
Weighted arithmetic mean	2,1		1,9		1,5	

Table 8.
Self-assessment results of specialists – employees of industrial enterprises in the automotive sector in terms of knowledge/skills in data protection and cybersecurity

How do you rate your understanding/skills regarding data protection and cybersecurity?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	45	1	30	1	32
Advanced	2	5	2	15	2	16
Specjalized	3	0	3	5	3	2
Weighted arithmetic mean	1,1		1,5		1,4	

Management by motivation - Essence of the method in the era of Industry 4.0

In the era of Industry 4.0, an important accent in the application of this method is the use of motivational systems based on gamification. Mobile applications for the coworking community are also used, introducing interesting solutions, comparing the results of various tasks, organizations or employees (Fantozzi, Di Luozzo, Schiraldi, 2024). Such motivation, especially

for the young generation, has become a support for rebuilding interpersonal relations. New competences developed through the use of the motivational management method are:

- adaptability in the workplace and development planning in the context of digital transformation,
- readiness for changes related to digital transformation / involvement in the digital transformation process,
- creativity and competition in implementing increasingly better digital solutions.

The results of the self-assessment of specialists - employees of industrial enterprises in the automotive industry are presented in Tables 9-11.

Table 9.
Results of the self-assessment of specialists - employees of industrial enterprises in the automotive industry in the field of adaptability in the workplace and development planning in the context of digital transformation

How do you assess your ability to adapt in the workplace and plan for growth in the context of digital transformation?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	10	1	5	1	42
Advanced	2	19	2	15	2	4
Specjalized	3	11	3	30	3	4
Weighted arithmetic mean	1,62		2,5		1,24	

Table 10.
Results of self-assessment of specialists - employees of industrial enterprises in the automotive industry on readiness for change regarding digital transformation / commitment to the process of digital transformation

How would you rate your readiness for change regarding digital transformation / commitment to digital transformation?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	31	1	12	1	2
Advanced	2	15	2	25	2	16
Specjalized	3	4	3	5	3	32
Weighted arithmetic mean	1,46		1,54		2,6	

Table 11.
Results of self-assessment of specialists - employees of industrial enterprises regarding creativity in implementing better and better digital solutions

How do you rate your creativity in implementing better and better digital solutions?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	45	1	30	1	20
Advanced	2	5	2	15	2	16
Specjalized	3	0	3	5	3	14
Weighted arithmetic mean	1,1		1,5		1,56	

Management by delegation of authority and controlling – Essence of the method in the era of Industry 4.0

In the era of Industry 4.0, an important element of applying this management method in supply chains is the use of integrated IT systems of the MRP, DRP, CRM class (Fantozzi, Di Luozzo, Schiraldi, 2024). Thanks to these systems, delegating authorizations is simple, and the decision-maker signs documents in the system with their marker/signature. In the era of implementing AI to optimize supply chains, new technology supports decision-makers in making decisions. Using blockchain, supply chain employees confirm their contribution. New competences developed through the use of the delegation management method (using modern technological tools of Industry 4.0) are:

- interdisciplinary and general knowledge of technologies and know-how of machines necessary to operate them,
- specialist and general knowledge of factory operations and production processes,
- ability to make decisions in the field of digital transformation.

The results of the self-assessment of specialists - employees of industrial enterprises in the automotive industry are presented in Tables 12-14.

Table 12.
Self-assessment results of specialists - employees of industrial enterprises in the automotive industry in the field of interdisciplinary and general knowledge of technologies and know-how of machines necessary to operate them

How would you rate your comprehensive and ever-expanding knowledge of the technologies and machine know-how necessary to operate them?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	15	1	10	1	28
Advanced	2	25	2	22	2	17
Specjalized	3	20	3	28	3	4
Weighted arithmetic mean	2,5		2,76		1,48	

Table 13.
Results of self-assessment of specialists - employees of industrial enterprises regarding specialized and generic knowledge about activities and production processes in the factory

How do you rate your comprehensive and constantly deepened knowledge of factory activities and processes?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	1	1	10	1	32
Advanced	2	5	2	35	2	16
Specjalized	3	44	3	5	3	2
Weighted arithmetic mean	2,86		1,9		1,4	

Table 14.
Results of self-assessment of specialists - employees of industrial enterprises regarding the ability to make decisions related to digital transformation

How do you rate your ability to make decisions regarding digital transformations in your company?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	45	1	30	1	36
Advanced	2	5	2	15	2	10
Specjalized	3	0	3	5	3	4
Weighted arithmetic mean	1,1		1,5		1,36	

Management by objectives - The essence of the method in the era of Industry 4.0

In the era of Industry 4.0, an important element of this method is the use of analytical systems using large data sets from inside the company and from outside (supply chain, economic environment) (Khan, Kumar, Singh, Ashraf, 2024). Some of the data used comes from radio beacons operating in BLE technology, others from satellites operating in GPS technology, still others from KPA KPI generating information based on artificial intelligence (Przegieliński, Jemielniak, 20023; Marr, 2022). New competences developed through the use of the management by objectives method are:

- the ability to analyze and process data received from machines,
- the ability to introduce data visualization and make decisions based on data,
- general knowledge of business statistics. The results of self-assessment of specialists - employees of industrial enterprises operating in the automotive industry are presented in Tables 15-17.

Table 15.
Results of self-assessment of specialists - employees of industrial enterprises from the automotive industry in terms of the ability to analyze and process data received from machines

How do you rate your ability to analyze and process data received from machines?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	0	1	5	1	32
Advanced	2	5	2	10	2	16
Specjalized	3	45	3	35	3	2
Weighted arithmetic mean	2,9		2,6		1,4	

Table 16.
Results of self-assessment of specialists - employees enterprises from the automotive industry regarding the ability to enter data visualization and make decisions based on data

How do you rate your ability to enter data, visualize and make decisions based on data?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	25	1	20	1	30
Advanced	2	15	2	15	2	15
Specjalized	3	10	3	15	3	5
Weighted arithmetic mean	1,5		1,9		1,5	

Table 17.
Results of self-assessment of specialists - employees enterprises from the automotive industry regarding generic knowledge of business statistics

How do you rate your knowledge of business statistics?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	45	1	30	1	42
Advanced	2	5	2	15	2	6
Specjalized	3	0	3	5	3	2
Weighted arithmetic mean	1,1		1,5		1,2	

Management by means of organisational culture - Essence of the method in the era of Industry 4.0

The considerations of many authors have shown that organizational culture influences the management methods used (Kinar, 2022) and vice versa, the management methods used shape the organizational culture. Organizational culture is also built by the values that the manager professes. In the era of Industry 4.0, remote work, open innovation, digital twins of production processes, it is necessary to deal with the construction of e-culture (Bulińska-Stangrecka, 2018). An important accent in the application of the management method using e-culture is shaping the values of a virtual organization, in which the social responsibility of employees is emphasized. In an open, dynamic virtual organization, the manager encourages, enables and ensures safe sharing of knowledge, encourages creative work, inspires risky behavior, and all this through intelligent IT systems (Pol, 2022; Zanon, Sigahi, Anholon, Carpinetti 2024).

New competences developed through the use of this method are:

- the ability to adapt to a digital workplace and readiness for digital change,
- the ability to work in a team on digital solutions and the willingness to share knowledge,
- the ability to change the way of thinking under the influence of learning.

The results of the self-assessment of specialists - employees of industrial enterprises in the automotive industry are presented in tables 18-20.

Table 18.
Self-assessment results of specialists - employees of automotive industry enterprises in terms of adaptation to the digital work environment and readiness for digital change

How would you rate your ability to adapt in a digital workplace and your readiness for digital change?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	10	1	5	1	32
Advanced	2	19	2	15	2	14
Specjalized	3	11	3	30	3	4
Weighted arithmetic mean	1,62		2,5		1,44	

Table 19.
Self-assessment results of specialists – employees of automotive industrial enterprises in terms of teamwork skills on digital solutions and willingness to share knowledge

How do you rate your ability to work in a team on digital solutions and your willingness to share knowledge?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	19	1	5	1	34
Advanced	2	10	2	15	2	12
Specjalized	3	11	3	30	3	4
Weighted arithmetic mean	1,44		2,5		1,4	

Table 20.
Self-assessment results of specialists - employees of automotive industrial enterprises in terms of their ability to change their way of thinking under the influence of learning

How do you rate your ability to change your way due to learning?						
degree	**Generation X**		**Generation Y**		**Generation Z**	
Basic	1	10	1	5	1	12
Advanced	2	19	2	15	2	24
Specjalized	3	11	3	30	3	14
Weighted arithmetic mean	1,62		2,5		2,04	

Table 21 contains the summary results of the analyzes collected in tables 6-20.

Table 21.
Summary results of the analyzes collected in tables 6-20

Management method by:	**Employee qualifications and skills desired in the era of Industry 4.0, and developed thanks to the use of the method**	**Self-assessment of specialists (employees of industrial enterprises) by generation**		
		X	**Y**	**Z**
communicating	communication competences using instant messengers	1.84	2.1	2.9
	the ability to use and interact with computers and intelligent machines	2.1	1.9	1.5
	data protection and cybersecurity understanding/skills	1.1	1.5	1.4
Average rating		1.68	1.83	1.93
motivating	ability to adapt in the workplace and plan development in the context of digital transformation	1.62	2.5	1.24
	readiness for changes regarding digital transformation / involvement in the digital transformation process	1.46	1.54	2.6
	creativity in implementing increasingly better digital solutions	1.1	1.5	1.56
Average rating		1.47	1.83	1.8
delegation of authority and controlling	interdisciplinary and generic knowledge of technologies and know-how about machines necessary to operate them	2.5	2.76	148
	specialized and generic knowledge of factory operations and production processes	2.86	1.9	1.4
	ability to make decisions regarding digital transformations	1.1	1.5	1.36
Average rating		2.15	2.05	1.41
goals	ability to analyze and process data received from machines	1.62	2.5	2.24
	ability to enter visualization data and make decisions based on data	1.46	1.54	2.6
	generic knowledge of business statistics	1.1	1.5	1.2

Cont. table 21.

Average rating		1.39	1.85	2.06
building organizational culture	ability to adapt in the workplace and readiness for change	1.62	2.5	1.44
	ability to work in a team and willingness to share knowledge	1.44	2.5	1.4
	the ability to change the way of thinking under the influence of science	1.44	2.5	2.4
Average rating		1.5	2.5	1.62

Source: own study.

The tables shows the evaluation of employees' qualifications and skills across different generations in the context of Industry 4.0, divided into four key areas: communication, motivation, delegation of authority and control, and building organizational culture. Generation Z demonstrates higher skills in digitalization and readiness for change, while Generations X and Y place more emphasis on technical knowledge and teamwork skills.

Discussion

The human factor is a fundamental component shaping new digital supply chains (DSCs) (Garay-Rondero, Martinez-Flores, Smith, Caballero Morales, Aldrette-Malacara, 2020). Human interaction with 4.0 technology has become an essential driver of sustainable and resilient supply chains (Xu et al., 2021). The increasing demand for digitisation of supply chains is forcing a focus on humans and enhancing their digital competence (Stiffler, Watt, Chumakov, 2020). A systematic literature review confirmed that digital technologies implemented in supply chains require new capabilities and skills from human resources (Benesova et al., 2017). It has also been confirmed (following Sima et al., 2020; Pejic-Bach et al., 2020; Matt et al., 2020), that there are cultural differences between employees of different supply chain organisations and differences between staff belonging to different generations. These differences consist of disparities in the possession of digital competences, but also in the possession of so-called soft competences. Researchers who have highlighted the changing demographics of the workforce in the context of the challenges of Industry 4.0 (Calzavara et al., 2020; Javaid, Haleem, 2020) have suggested that ‘there is generational diversity that needs to be taken into account when applying selected management approaches during the digital transformation of the enterprise and the entire supply chain’.

Other researchers have highlighted that the introduction of Industry 4.0 systems and technologies brings opportunities and pitfalls for organisations and management (Benesova, Tupa, 2017; Nahavandi, 2019; Xu et al., 2021). These researchers sought to affirm that ‘a manager should apply utilitarian management methods and seek universal principles that will support him or her in managing a multicultural and multigenerational workforce during a difficult time of transition’. The recommendations formulated in the article were guided by the research (Nahavandi, 2019; Xu et al., 2021). The aforementioned authors believed that

existing management methods may no longer be acceptable in companies and supply chains implementing the new technologies of Industry 4.0 and 5.0. Following (Dezi et al., 2018; Ozdemir, 2018) it was confirmed that it is, however, possible to look for golden rules while applying utilitarian methods to manage multicultural and multigenerational human resources. Based on utilitarian management methods and identifying new competences of employees related to the support of Industry 4.0 (Wang, Kang, Childerhouse, Huo, 2018; Fantozzi, Di Luozzo, Schiraldi, 2024; Khan, Kumar, Singh, and Ashraf, 2024; Zanon, Sigahi, Anholon, and Carpinetti 2024), own research was prepared and conducted. The research was conducted in companies in the automotive industry that had undertaken digitisation efforts for integration within their own supply chains. The research conducted confirmed that the introduction of Industry 4.0 systems and technologies entails opportunities and risks for organisations and management (Benesova, Tupa, 2017; Nahavandi, 2019; Xu et al., 2021). The research also confirmed that 'a manager can, using known management methods and effectively compensate for identified competency gaps'. The inspiration for seeking recommendations for managers managing a multicultural and multigenerational workforce in the automotive supply chain was the literature cited in the chapter: Literature review. Confirmation of the hypotheses and recommendations are included in the chapter: Conclusions.

Conclusions

Multigenerational workforce management methods are evolving in the era of the fourth industrial revolution. The dynamics of change in companies and supply chains undergoing digital transformation, and the challenges of managing human resources, call for new management methods. Inspired by the literature reviewed and bearing in mind that the multi-generational workforce of cooperating companies represents unique values, preferences, needs and digital competencies, the following recommendations were made:

- Managers of digitised supply chains (in which their companies co-operate) should note the cultural and generational differences of the workforce.
- When working with a multicultural workforce within a single supply chain, managers should strive to select and apply a guiding management method (in the era of Industry 4.0 for companies in automotive supply chains, the most important method to be applied among professionals - will be: management by objectives).
- When working with a multi-generational workforce, the manager must be very flexible in applying subordinate management methods. The methods known so far should be modified for each generation. It is therefore worth considering introducing complete freedom in their selection and application.

- When applying the management-by-communication method, one utilitarian principle applies, i.e. providing quick feedback. The key is an efficient flow of communication within the company, based on the concept of rapid feedback. However, it is worth paying attention to the preparation of the different communicators preferred by the three generations described. It is also worth paying attention to the intonation of messages and the words and phrases used, which should be adapted to the generation. Preparing guidelines for differentiating communicators and messages would improve the atmosphere in a digitised workplace. It is certainly necessary to create a space for friendly relations between multigenerational employees (so that they can support each other in the difficult transition process).
- When applying the management by delegation method, it is worth using the universal principle that tasks should always be delegated. Only select the difficulty of tasks according to the experience, skills and qualifications of the employees. What is important is that people have the power to do things, to make decisions, and are able to demonstrate and perhaps even self-actualise. By delegating increasingly challenging tasks, the manager will certainly have a positive impact on the employee's perception of importance, belonging and loyalty. Different generations require different clarification of delegated tasks. Generation Z is the most demanding in this respect.
- When applying the management-by-motivation method, it seems to be a universal principle that a manager should create the conditions for the continuous professional development of employees. However, Generation Z will play a key role in the digital transformation, having the least experience but the highest digital competence. The most effective form of motivating generation Z seems to be the implementation of gamification. Other generations may not accept this form and their motivation should take traditional forms, such as appointing X and Y to friendly transformation teams where they will be recognised for their experience.
- When applying the management-by-controlling method, it is worth considering building control into daily activities and processes (developing a transparent control and evaluation system). Generation Z lacks mental and emotional stability and personalised controls could increase insecurity and be a catalyst for stress. Older generations will also view systemic solutions positively. In the age of digitalised processes, constant control of work is possible and is likely to have a positive impact on the wellbeing and effective performance of all generations. If it is necessary to give an employee a low appraisal, the manager should be able to convey a non-intrusive critical message. This is important in the case of generation Z, which is very sensitive to any unfavourable and uncomfortable situations and prone to feeling negative emotions.

- Using the management-by-objectives method, an ironclad principle can be reapplied - even in a multi-generational working environment. Everyone should be involved in building goals, starting with operational goals (lower-level employees should be involved in formulating them) and ending with strategic goals (built with senior employees). It is important to remember that all generations are in agreement about being able to express their own thoughts and suggestions based on their position. The manager should listen carefully and, if possible, link the goals of the employees to those of the company and the supply chain. For Generation Z in particular, it is important that their career path coincides with the technological developments of the organisation and the super-organisation. When working with Generation Z, care should be taken not to belittle their skills and to try to break down the barrier that may arise from a lack of confidence in their experience and competence.
- Adapting the company culture to that of the supply chain is very difficult for the manager. The manager has to keep in mind that any change in organisational practices will be interpreted differently by generations shaped by a different socio-cultural reality. The most important thing in the difficult process of building a new organisational culture is for the manager to be willing to understand the motives of each generation and to be understanding of the differences and values. The most valuable attribute of any organisational culture being built is mutual intergenerational respect and inclusivity. In a challenging time of digital transformation, these attributes will be helpful in bridging the competency gaps of multigenerational team members.

The analysis of the literature confirmed that modern management in a multicultural and multigenerational work environment poses numerous challenges for managers, but also opens up new opportunities. The key to success is to skilfully exploit diversity by adapting methods of motivation, control, goal-setting and building the organisational culture of the supply chain.

The results of the research confirm that managing people from different cultures and generations can present both opportunities and challenges due to different needs in terms of: communication; motivation; delegation and control; goal setting; and values, which determine the construction of the organisational culture. Managers should create a space for professional development in which employees from all co-operating organisations and all generations can excel and realise their aspirations. Particular attention should be paid to generation Z, who, although they may lack experience, have high digital competence, which is crucial in this age of technological transformation. There are several recommendations from the research for effectively managing employees from different cultures and generations:

- Recognise that each generation has unique experiences, values and communication preferences shaped by the events of their growing up years.
- Familiarise yourself with the characteristics of the generations remaining in the labour market, such as Generation X, Generation Y and Generation Z.

- Adapt the method of management through communication to their preferences for communication channels and style of message.
- If your company is undergoing a digital transformation, know that Generation Z is best equipped to communicate using Industry 4.0 tools (the average score for a Generation Z professional coming from an automotive company is 1.93 points out of 3 possible - see Table 19). However, delving deeper into the assessment criteria used in the survey, it is important to note that Generation Y scores better in the self-assessment of 'ability to use and interact with computers and intelligent machines'. - When delegating authority, duties and responsibilities, consider that each generation has different experience, seniority and knowledge.
- If your company is undergoing a digital transformation, know that generation X is best placed to delegate authority to make important transformational decisions. This is because they highly value their 'specialist and general knowledge of factory operations and processes'. Therefore, X should be on the decision-making team. Delegate important tasks/decisions to Y because, they rate themselves highly for their 'interdisciplinary and general knowledge of the technology and know-how of the machines needed to operate them' and their 'ability to make digital transformation decisions'. The self-assessment shows that Z are not yet ready to delegate difficult transformation decisions to them.
- Use the management-by-motivation method. It seems to be a universal principle to recognise achievements and create an environment that enables continuous professional development for employees.
- If your company is undergoing a digital transformation, know that Generation Y professionals adapt best in the workplace and identify with the planned digital development. Generation Z is rated highest for: 'readiness for change regarding digital transformation / commitment to the digital transformation process' and "creativity in implementing better and better digital solutions".
- When managing targets, distribute them, taking into account the experience and knowledge that older generations bring, and create opportunities for knowledge sharing and mentoring. From interviews (with automotive managers), the Management by Objectives method (used among executives and specialists) is leading the way in transforming automotive supply chains.
- Formulate measurable goals, clearly articulate objectives and provide regular feedback on the evaluation of goal achievement.
- Remember that it is your job (until AI replaces you) to set goals for individual employees. Make your job easier and manage your staff effectively by collecting and analysing data. Data on employee performance, satisfaction or motivation will allow you to make more informed personnel decisions. The use of analytical tools supports

the identification of areas for improvement and optimises the allocation of human resources. - If your company is undergoing a digital transformation, know that Generation Z professionals are best rated for their 'ability to input data, visualise and make decisions based on data', Y have the best 'ability to analyse and process data received from machines' and 'general knowledge of business statistics'.

- Promote a culture of continuous learning to attract the attention of younger generations who may value professional development opportunities. Be open to flexible working arrangements, being aware that younger generations may value work-life balance and flexible schedules. Allow for a variety of working styles, as some may prefer a collaborative environment, while others may excel in a more independent setting. Promote intergenerational integration. Encourage an inclusive environment where all team members feel valued, regardless of age. Avoid creating assumptions and stereotypes based on age. Treat individuals as unique contributors with different skills and perspectives. Encourage collaboration and inclusion in decision-making processes. Ask for feedback from different age groups to ensure different perspectives are taken into account when making important decisions. Emphasise a common supply chain goal. Connect the inter-organisational team through a common purpose or mission that transcends generational differences. Help individuals see how their unique contributions contribute to the overall success of the team or organisation. By acknowledging and accepting the differences between team members, you can create a more inclusive and collaborative work environment that leverages the strengths of each generation.
- If your business is undergoing a digital transformation, know that Generation Y professionals are the most adaptable in the workplace and are ready for change; they will bridge the gap between the digitally conventional X experience and the digitally creative but uncertain Generation Z.

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