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The skills members of multicultural teams need to succeed in Industry 5.0 – the opinion of managers from Portugal, France, and Greece

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Abstract

Nowadays managers need knowledge of current technological trends in order to be able to make strategic decisions, accurately predict the future, and make the best use of the existing opportunities for the development of their companies. Industry 5.0 poses new challenges in the area of people management, including those related to workforce skills required by employers and necessary in the near future in the efficient management of companies, their effective operation, and a competitive advantage in the market. The concept of Industry 5.0 requires companies and managers to change their attitude to employees. Their new *modus operandi* should cover new requirements regarding workforce skills and new ways of attracting and retaining human capital equipped with adequate skills.

The aim of this article is to present workforce skills identified by managers from three European countries (Portugal, France, and Greece) as particularly important in Industry 5.0. The research methods used in the study are a literature review and 12 individual in-depth interviews conducted in 2023 (four interviewees from each country covered by the study).

The analysis of literature and the interviews conducted by the author reveal that workforce skills in Era 5.0 are moving in the direction of soft skills and can be divided into four groups: problem-solving, working with people, technology use and development, and self-management. Workforce skills in Industry 5.0, especially those related to managing multicultural teams, is a research area which has not been extensively studied so far. Even though the study described in the article is only qualitative and conducted on a small sample, its results justify recommending further in-depth studies and can be used by companies to improve their search for employees who possess skills which correspond to the requirements of Industry 5.0.

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1. Introduction

Workforce skills which address the requirements of the transition period from Era 4.0 to Era 5.0 is a topical and highly relevant research area, as indicated by – still rather scarce – publications devoted to this topic [1], [2], [3].

In the author's opinion, workforce skills related to Era 5.0 are of particular relevance in culturally diverse work environments in which managers of multicultural teams and members of such teams, who sometimes come from totally different cultures, pursue team and organisational goals together. They do so by sharing their knowledge and experiences, often in conditions of substantial differences in behaviours, working styles, communication, ways of solving problems, and reactions to change. Multicultural work environments pose a number of challenges related to, for example, employees' integration, promotion of shared values, respect for cultural differences, and a number of skills needed to succeed in the new business model in the era of Industry 5.0 [4], [5], [6]. Industry 5.0 is characterised by the automation of processes which underlie collaboration between humans, robots, and algorithms. Consequently, this will lead to changes in working style, task performance, workforce requirements, and expectations related to workforce skills.

The aim of this article is to present workforce skills identified by managers from three European countries (Portugal, France, and Greece) as particularly important in Industry 5.0.

The interviews with managers conducted by the author were based on the classification of skills described in the World Economic Forum Report [7]. This classification and the results of the interviews have allowed the author to identify four groups of workforce skills that are likely to play a vital role in Industry 5.0. These are: problem-solving, working with people, technology use and development, and self-management.

In order to achieve the aim of the article, the author has formulated the following research problem: What workforce skills do the Portuguese, French, and Greek managers of multicultural teams consider particularly important in Era 5.0? This research problem is the same as the one in the interviews conducted by the author in 2022 with the managers from Poland, Spain, Italy, and the Czech Republic (which are described in another article to be published soon). The interviews described here are a continuation of the author's study dedicated to workforce skills in Industry 5.0 in culturally diverse work environments from the perspective of managers' knowledge, experiences, and requirements.

The analysis of literature and the results of the interviews point to a big role played by various groups of workforce skills in the context of the requirements of Industry 5.0 in managing multicultural teams.

2. Workforce skills in Industry 5.0

Researchers study workforce skills under conditions of change in the context of challenges faced by management in various areas, especially people management [8], [9], [10], the labour market [11], [12], and the future of employment [13], [14], [15].

A characteristic feature of Industry 5.0 is the integration of people and artificial intelligence, which requires everyone, both managers and employees, to change their previous ways of doing things and working styles, the way they think, behave and solve problems, and to introduce new ways of collaborating and interacting [16], [17], [18], [19].

Era 5.0 will bring an acceleration of automation, the emergence of new industries and new jobs. It should be emphasised that, as predicted in the Future of Jobs Report (2020), the occupations of the future will require employees to acquire and develop new skills on a continuous basis. They will have to perform increasingly complex tasks, make multi-faceted, strategic decisions, and solve more complex problems than today. The ability to think analytically and creatively, effective communication, technological skills, flexibility, and high resistance to stress

will be essential. The analysis of workforce skills in Industry 5.0 presented in the article is based on the guidelines set out in The World Economic Forum (Future of Jobs Report, 2020), which list the following ten skills as the top ones in 2025: analytical thinking and innovation; active learning and learning strategies; complex problem-solving; critical thinking and analysis; creativity, originality, and initiative; leadership and social influence; technology use, monitoring, and control; technology design and programming; resilience, stress tolerance, and flexibility; reasoning, problem-solving, and ideation. These skills are divided into four categories (groups): problem-solving, working with people, technology use and development, and self-management [20].

The first group of skills is linked to problem-solving and covers analytical thinking and innovation; complex problem-solving; critical thinking and analysis; creativity, originality, and initiative; reasoning, problem-solving, and ideation. The skills from this category will be valuable in Industry 5.0 because its employees will have to think analytically and critically, be inventive, open-minded, and original in finding new solutions, and successfully solve increasingly complex problems. Critical thinking and collaboration between people, robots, and algorithms will be a major element of work in the future [20].

The second group, i.e. working with people, which includes skills in the area of leadership and social influence, will also be highly relevant because Industry 5.0 is human-centred. Hence leadership issues, including leader's attitudes and behaviours based on collaboration, communication, and exerting influence, will be tools useful in ensuring engagement and participation and increasing social impact in the change process [20].

The third group, i.e. technology use and development, consists of skills in the area of technology use, monitoring and control, and technology design and programming. These skills are particularly relevant in the context of the requirements of Industry 5.0, as future work will require advanced technological skills, the ability to use technology effectively, and to design new solutions which companies will need to operate effectively and be competitive in the market [20].

The fourth group is self-management, which includes active learning and learning strategies as well as resilience, stress tolerance, and flexibility. Successful adaptation to the era of Industry 5.0 will require employees to possess well-developed self-management skills, particularly in the areas of active learning, resilience, stress tolerance, and flexibility, as they will enable their effective functioning under conditions of change [20].

The era of Industry 5.0 is primarily a new vision of how businesses will operate. From a business perspective, Industry 5.0 is a great challenge, which is a promising research area in many scientific disciplines and management areas. Future business opportunities and economic benefits in Era 5.0 require effective management of employees' potential, which entails a substantial change in the approach to workforce skills and their optimal use.

3. Potential of multicultural teams

Nowadays multiculturalism is a commonplace reality of many companies, especially those which operate internationally. Hence, the knowledge regarding differences between cultures is of utmost importance in implementing effective solutions in the area of people management, especially in case of culturally diverse teams. Multicultural teams pose a number of challenges for managers [21]. On the one hand, ignorance of values and habits of employees from other cultures can lead to misunderstanding and conflict in daily work [22], [23]. On the other hand, employees' cultural diversity can significantly enhance teams and companies knowledge, their creation of innovative solutions, willingness to take on new challenges, and their competitiveness [22], [23]. Companies with multicultural teams have a great potential for development, the capacity to act flexibly and to adapt quickly to changing environmental conditions by capitalising on the skills, knowledge, and often unique experiences of culturally diverse employees who possess knowledge of different markets and can analyse and solve problems from different perspectives.

Researchers have been investigating multiculturalism for years, and both positive and negative aspects of multicultural teams have been widely described in literature. Their advantages include greater creativity [24], [25], increased levels of innovation [26], [27], more complex and analytical thinking [28], [29], improved quality, enhanced learning capacity, positive organisational change, greater satisfaction, and more effective communication [30], [31].

Moreover, multicultural workforce allows members of culturally diverse teams to use their first-hand knowledge of various cultures in successful task performance and effective problem solving which are possible thanks to taking

into account different cultural perspectives and contexts, dealing with complex situations, and effective communication. Experiences of employees from different cultures are also conducive to more creative problem-solving, effective search for new solutions, and generation of new ideas and concepts.

However, multicultural teams also have disadvantages, which include distrust, conflict, and difficulties in communication, which directly stem from cultural differences between their members, who are also prone to stereotypes and cultural clash. These may have a negative impact on relationships between employees, lead to lower quality of task performance, and hinder cooperation between team members. Other negative aspects of multicultural teams can be found in the areas of culturally-based differences in communication and perception of time and space, endorsed values, preferred working styles, and the ways in which interpersonal relationships are formed.

From the perspective of the challenges of Industry 5.0, managers will need to pay particular attention not only to workforce skills necessary to successfully complete tasks and achieve organisational goals but also to skills that will lead to dynamic, effective collaboration in multicultural teams [32]. Given a variety of cultural differences, managers in charge of such teams will face numerous challenges [33], [34]. They will also have to analyse and assess employees' skills related to intercultural communication and intercultural conflict resolution, their flexibility and openness to build positive relationships in multicultural environments, as well as their cultural awareness, cultural sensitivity, and cultural intelligence [35].

4. Methodology

In order to achieve the research objectives, the author reviewed relevant literature and conducted her own study. The article is based on partial results of the interviews with managers from selected European countries she conducted in 2023. These results focus on the opinions of managers of multicultural teams from Portugal, France, and Greece regarding the workforce skills particularly important in Era 5.0.

The individual in-depth interviews reported in the article were conducted with Portuguese, French, and Greek managers (four managers from each of these countries) between January and March 2023. Interestingly, in this study the author managed to interview Greek managers for the first time in her research practice. The interviews described here are a continuation of a study conducted in 2022 among Polish, Spanish, Italian, and Czech managers, the results of which are presented in another article to be published soon.

All the interviews conducted in 2023 took place online, through the ZOOM application, while all those from 2022 were conducted through face-to-face meetings (in Poland with the Polish managers, and in Spain, Italy, and the Czech Republic with the Spanish, Italian, and Czech managers, during the author's research trips to these countries). The criteria for selecting managers for the interviews described in the article were the same as in case of the interviews from 2022: work experience (i.e. working in a multinational company in a managerial position for a minimum of three years) in managing multicultural teams whose members come from at least three different countries/cultures.

The characteristics of the respondents (i.e. managers who took part in the interviews) are as follows. Portugal: age of respondents: 39-44 years old; gender: 3 men and 1 woman; experience in a managerial position: 5-11 years; number of nationalities in the team: 5. France: age of respondents: 38-46 years old; gender: 2 men and 2 women; experience in a managerial position: 4-10 years; number of nationalities in the team: 4. Greece: age of respondents: 38-41 years old; gender: 4 men; experience in a managerial position: 4-9 years; number of nationalities in the team: 3.

The interviews were qualitative in nature and lasted between 60 and 70 minutes. They were based on the same interview scenario the author had prepared for her previous interviews with the Polish, Spanish, Italian, and Czech managers in 2022. The author is aware that her qualitative studies are characterised, on the one hand, by subjectivity but, on the other hand, also by great methodological flexibility [36], [37]. The participants of the study were recruited by means of nonprobability sampling, which involves a deliberate selection of those individuals who meet specific criteria [38]. The method used in both studies, the one conducted in 2022 and the one from 2023 described here, was snowball sampling.

All interviews were conducted in English (although two French managers asked to be sent the questions (i.e. the sketch of the interview scenario) in advance in order to be able to prepare their answers in English). At the very beginning of each interview, the author briefed the respondents on the research method and technique, the purpose of

the interview, and such formal issues as the anonymity of the results and how the data would be used. Some of the interviews were recorded (two Portuguese and two Greek managers agreed to this form of data collection), while during the remaining ones the author took notes. The empirical material collected during the interviews was later subjected to qualitative analysis (and, where possible, also to quantitative analysis).

5. Results of the study

The objectives the author aimed to achieve by conducting the interviews were as follows: (the objectives of the interviews conducted in 2022 with managers from other European countries were the same):

- To obtain information from managers on their understanding of the terms 'Industry 5.0' and 'Era 5.0' (their answers to these questions are not analysed in this article).
- To identify workforce skills considered by managers to be particularly relevant in Industry 5.0 (the author used the classification provided by the 2020 Report of the World Economic Forum).
- To identify the areas in managing multicultural teams in which, according to the managers who participated in the interviews, workforce skills in Industry 5.0 will be crucial in the efficient performance of such teams.
- To obtain managers' opinion on the challenges in the area of workforce skills that are important for the efficient performance of multicultural teams in Industry 5.0.

The paragraph below summarises managers' responses to the questions regarding workforce skills they believe will be particularly relevant in Industry 5.0. The author showed the managers a list of ten skills provided in the Future of Jobs Report (2020) and asked them those which, in their opinion, will be the most desirable ones in 2025. The list of ten skills included: analytical thinking and innovation; active learning and learning strategies; complex problem-solving; critical thinking and analysis; creativity, originality, and initiative; leadership and social influence; technology use, monitoring, and control; technology design and programming; resilience, stress tolerance, and flexibility; and reasoning, problem-solving, and ideation. The managers' choices were as follows:

- analytical thinking and innovation (3 Portuguese managers; 4 French managers; 3 Greek managers);
- active learning and learning strategies (3 Portuguese managers; 4 French managers; 2 Greek managers);
- complex problem-solving (4 Portuguese managers; 4 French managers; 3 Greek managers);
- critical thinking and analysis (4 Portuguese managers; 4 French managers; 2 Greek managers);
- creativity, originality, and initiative (4 Portuguese managers; 4 French managers; 3 Greek managers);
- leadership and social influence (3 Portuguese managers; 4 French managers; 3 Greek managers);
- technology use, monitoring, and control (4 Portuguese managers; 4 French managers; 4 Greek managers);
- technology design and programming (4 Portuguese managers; 4 French managers; 3 Greek managers);
- resilience, stress tolerance, and flexibility (4 Portuguese managers; 4 French managers; 3 Greek managers);
- reasoning, problem-solving, and ideation (4 Portuguese managers; 4 French managers; 2 Greek managers).

The skills chosen by all the respondents were those from the area of technology use, monitoring, and control (4 Portuguese managers, 4 French managers, and 4 Greek managers). These were followed by skills related to complex problem-solving, creativity, originality, and initiative, technology design and programming, resilience, stress tolerance, and flexibility (4 Portuguese managers, 4 French managers, and 3 Greek managers).

To compare, the top skills chosen by the Polish, Spanish, Italian, and Czech managers who were interviewed in 2022 were: complex problem-solving, leadership and social influence, technology use, monitoring and control, technology design and programming, and resilience, stress tolerance and flexibility.

During the interviews, managers also pointed to those areas in managing multicultural teams in which, in their opinion, workforce skills in Industry 5.0 will be crucial in the efficient performance of such teams. The Portuguese managers listed doing projects and developing solutions to complex problems, especially those that require modern IT tools, as the key areas where team members' skills will be particularly relevant. They also mentioned the creation of such a working environment in which flexibility and accurate risk assessment and analysis will be a vital element of collaboration between team members.

For the French managers, all ten skills listed in the Report were highly relevant in the efficient management of multicultural teams in Industry 5.0, although they emphasised the importance of advanced technological skills and the need to create such an environment – with communication as its key element – in which employees can fully use

their creativity to solve complex problems. The Greek managers pointed at employees' technological skills and their capacity to adequately use them to complete tasks and collaborate with other teams, as well as at stress management as the skills most beneficial in Industry 5.0.

During the interviews, the managers also voiced their opinion on the challenges in the area of workforce skills that are important for the efficient performance of multicultural teams in Industry 5.0. All of them listed employees' participation in trainings and workshops and challenges involved in accurately identifying employees' skills gap. They also mentioned procedures and solutions used in the recruitment and selection of candidates, which should account for skills needed in Industry 5.0, plans and programmes of a company's development based on the requirements of Industry 5.0, and new challenges faced by companies in the area of workforce skills.

6. Discussion

Not many researchers have analysed relationships between Industry 5.0 and workforce skills that will be needed in the near future (see articles [2], [20], [39], [40]). However, a growing interest in this area can be noticed, as these skills will significantly affect the operation of companies in Industry 5.0.

The individual in-depth interviews conducted by the author with the Portuguese, French, and Greek managers in 2023 allowed her to achieve the objectives of the study. The interviews provided the answer to the research question formulated in the introduction: What workforce skills do the Portuguese, French, and Greek managers of multicultural teams consider particularly relevant in Era 5.0? The top of managers' list is occupied by technology use, monitoring, and control (4 Portuguese managers, 4 French managers, and 4 Greek managers), which is followed by complex problem-solving; creativity, originality, and initiative; technology design and programming; and resilience, stress tolerance, and flexibility (4 Portuguese managers, 4 French managers, and 3 Greek managers).

The respondents also identified the areas of managing multicultural teams in which, in their opinion, workforce skills in Industry 5.0 will be crucial in the efficient performance of such teams. These are the areas related to doing projects, solving complex problems, using modern IT solutions, risk analysis, communication, and stress management. According to the managers, in the context of workforce skills and requirements related to Industry 5.0, the particularly relevant areas of people management are those linked to recruitment, selection, training, and development.

Moreover, the managers pointed to the following areas as those which affect multicultural work environments in Industry 5.0 the most: effective intercultural communication, efficient development of positive, culturally diverse relationships, employees' adaptability, and their ability to quickly resolve intercultural conflicts.

7. Conclusions and Recommendations

Industry 5.0 will undoubtedly lead to the emergence of new demands on workforce skills. Upcoming changes mean that companies should thoroughly analyse and assess their needs in the context of new challenges. In Era 5.0, automation will accelerate and new industries and new jobs will appear. Occupations and skills of the future will require workers to acquire, update, and develop new skills on a continuous basis.

Employers will be looking for employees who possess well-developed analytical and critical thinking skills and are open to new and unconventional solutions, whose attitudes and behaviours are based on collaboration and effective communication, and whose advanced technological skills translate into quick and efficient task completion. Active learning and resilience to stress and a high degree of flexibility will also be desirable.

Upcoming changes in the area of workforce skills requirements will lead to changes in organizational structures and in ways in which teams are built and managed. Successful management of culturally diverse teams will be among crucial challenges. The technological revolution will put pressure on the search for new workforce skills, but multicultural teams will continue to require managers who are culturally sensitive, tactful, and flexible, perhaps even to a higher degree than before. When skilfully managed, multicultural teams yield greater creativity and innovation, a set of diverse and valuable experiences, unique knowledge in solving complex problems, the ability to find new solutions, greater flexibility and adaptability, increased productivity and growth of an organisation.

There is no doubt that in Industry 5.0 new requirements in the area of workforce skills will be of utmost importance. Moreover, in view of upcoming changes, successful intercultural communication and the capacity to efficiently collaborate in culturally diverse teams will be a must if companies want to take full advantage of the potential of their multicultural teams.

8. Limitations and recommendations for future research

The author is aware of the limitations of the study (interviews) she conducted. Nonprobability sampling and the snowball sampling technique severely limited potential participants and restricted them only to those the author managed to reach using her personal network. Another weak point of the study is a small research sample, as it consisted of only 12 respondents. An obvious recommendations linked to this point is to increase the research sample in future studies in order to obtain more reliable results – both in terms of a number of countries (also those from other continents) and a number of managers from each country.

As part of future research, it would be worthwhile to obtain information on workforce skills relevant to Industry 5.0 not only from managers but also from members of multicultural teams (from both European and non-European countries). An interesting research area would be to extend the analysed issues to include managers' skills which are likely to significantly affect their efficiency and effectiveness in working with multicultural teams under conditions of Industry 5.0. In this case, the research perspective could be broader and include, as already mentioned, managers from non-European countries. The author also recommends extending future research by conducting interviews with HR specialists (i.e. employees of HR departments), who could identify employees' and managers' skills which seem to be crucial in Industry 5.0 from their perspective, particularly in the context of multicultural teams.

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