

# Exploring Organizational Strategies for Development of Digital Skills: A Case Study



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**Abstract** Our contemporary society is increasingly based on globalization, technological progress and fast knowledge accumulation. Technological change pushed companies to change their structure, indeed, the fast integration of information and communication technologies (ICTs) is leading to a continuously evolving digital skills (DS) set necessary for employment and participation in society. This happens because employees' skills drive organizations' innovation capacity and competitiveness. In this study, we decided to analyse the manager's DS perception of a multinational firm present in 18 countries and operating in a manufacturing sector. Our results put in evidence that managers do not seem to have a clear and well-defined managers' perception about DS required in industries.

**Keywords** Digital skills · Manager's perception · Strategies · Digital transformation

## 1 Introduction

Our contemporary society is increasingly based on globalization, technological progress and fast knowledge accumulation [1]. Information, knowledge, and creativity are the new guideline for the modern economy [2, 3]. If on one hand the industrial economy has transformed into an economy based on information-oriented services [2], on the other hand these changes have reshaped the workplace and the work itself [4, 5]. Indeed, the fast integration of information and communication technologies (ICTs) is leading to a continuously evolving digital skills (DS) set necessary for employment and participation in society [2]. This happens because employees' skills drive organizations' innovation capacity and competitiveness [6].

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Firms today are looking for highly skilled workers who have excellent technical preparation and at the same time have skills to face change [7, 8]. The Organization for Economic Co-operation and Development (OECD) (2017) and the European Commission too has emphasized that it is of fundamental importance to develop adequate skills to get the most from the digital economy and individual markets [9]. Today's high rate of change and the high influence of technology push companies to develop employees' DS in order to cope with this change [10, 11]. Moreover, several reports highlight how the acquisition of adequate digital skills is transformed into job opportunities [12], how prepare workers, carrying out certain activities, to learn or improve digital skills [13, 14] in order to prepare employees for the digital transformation and to "successfully navigate through an ever-changing, technology-rich work environment" [15]. For these reasons and to address the digital transformation correctly, it becomes important to recognizing a suitable set of DS [16].

In this study, we decided to adopt Van Laar et al. [10] twenty-first century digital skills classification in order to analyse the manager's DS perception of a multinational firm present in 18 countries and operating in a manufacturing sector. The aim of this research is to understand if manager's DS perception, related to the digital transformation, is in line or not with DS elaborated from the theory, what are the skills that managers perceive as needing to be implemented or improved. Moreover, we want to understand if and how manager's perception differs across different departments.

Van Laar et al. [10] conducted a literature review where they synthesized the most important academic literature related to 21st-century digital skills (DS). They elaborated a clear classification of the concept of skills needed in a digital environment. Specifically, they have identified which digital aspects should be integrated with the concepts of 21st-century skills [10]. These DS are today the reference point for innovation and competitiveness of workers and organizations [10] because are essential and useful to fulfil a wide range of occupational tasks [17]. A crucial aspect, for operational and managerial level, that organizations may fail and that shouldn't be underestimate is the process of defining the skills to be developed [18–20] or used for the personnel selection process [21]. Indeed, past research demonstrates that: managers neither have skill requirements top of mind [17, 22] and managers don't have a clear understanding of the role skill development plays in organizational management practices [22, 23]. Therefore, our study answers the following research question: *"What are the strategies, according to managers perception, to develop and enhance the digital skills within the organization?"*.

The paper is structured as follows: we report a literature review of previous evidence on the topic in Sect. 2. The method used to collect data is explained in Sect. 3. Data analysis are identified and explained in Sect. 4. Data are discussed in Sect. 5. In the last section we have discussed conclusion implications of our findings, limitations of the work and suggestions for future research analysis.

## 2 Literature Review

The globalization of markets led to more intense competition among firms, but also economic interdependence and broad collaboration through thousands of jobs have been lost due to relocation or automation [6, 24]. At the same time many typologies of jobs (e.g., engineering, management, education) where social interaction or creative skills are present, are less likely to suffer from job losses. This means that ICTs change the way of working day by day increasing efficiency of firms [25] and at the same time reshapes the required skills [26]. Indeed, the ever-increasing flexibility required in production and supply services has redesigned the workplace too [27]. More flexible working arrangements, broad information sharing, flatter decision-making structure, more distributed and decentralized decision making are just a few examples [27].

The added value that differentiates companies lies in the skills and abilities acquired over time. For this reason, firms are acquiring highly skilled workers who can adapt to the changing needs of work and deal with increasingly interactive and complex tasks [8]. Also, companies support and invest in those workers who are willing to update their knowledge and skills because the success of sustainable and high-performance organizations derives largely from these employees, representing the human capital [28]. Furthermore, the influence of technological change on demand for skills and employment should not be underestimated because the adoption of new technologies improve productivity and can move (displace) workers (from one place to another) [29].

Many employers are concerned about the technical gap between what students know and what they need [30] also they expect new graduates are able to understand how navigate in an digital and integrated environment in their new careers [31]. A comprehensive study of recent technological advances in demand and skill supply is provided by Brynjolfsson and McAfee [32]; Dachs and Peters studies [33] also highlight the positive correlation between job growth and workers' skills change. Moreover, the use of new technologies involves more skills and training in employees because these skills and training facilitate them in the implementation of new technologies [14, 34]. Mohnen and Roller studies confirm through statistical evidence that employee skills are an important innovation factor for companies due to the high rate of change [35]. Specifically, they observed and analysed the most important innovation obstacle in different industries and countries: the lack of skills.

Different researches, embedded Lewin and McNicol's [36] studies, contributed to the evolution of twenty-first century skills through ICT. Specifically, they talk about the importance of ICT in relation to the development of twenty-first century skills and how they lead to a successful career [36, 37]. Voogt and Roblin [38], in their studies, identified and explored some of these skills that go beyond the mere knowledge of specific software [7, 39] and concern: creativity, problem solving, critical thinking, productivity, digital literacy, collaboration, citizenship, and communication. Another great classification drafted by Claro et al. [39] puts in evidence the most important DS of the twenty-first century; in particular they elaborated four macro-classes of skills:

ability to solve cognitive tasks through the use of ICT, skills not related to technology (software), skills related to higher-order thought processes, cognitive abilities that promote continuous employee learning. Moreover, a wide range of classifications is present in literature. In order to comprehend and clarify different notions, Van Laar et al. [10] differentiate between technological skills, twenty-first century skills and twenty-first century digital skills. Talking about the technological skills, Hatlevik et al. [40] defined them as the skills that we need in order to use computers or Internet and to acquire DS of twenty-first century. Ferrari [9] analysed and elaborated a clear classification of what digital competencies are: evaluation and resolution of problems and technical operations, sharing, communication, creation of content and knowledge, collaboration, ethics and responsibility information management.

Going forward with the analysis of past studies, we find two of the most important “twenty-first century skills classification. The first, realized from the Partnership for the twenty-first century (P21) [27] differentiate three macro classes of skills, which are determined by sub-sets of skills: (i) learning skills (communication, creativity and innovation, critical thinking and problem solving), (ii) literacy skills (literacy, media and ICT information) and (iii) life skills (adaptability and flexibility, productivity and responsibility, leadership and responsibility initiative and self-direction, social and intercultural skills). The second, elaborated from the assessment and teaching of twenty-first century skills (ATC21S) and through the help of experts [41] identifies four macro-classes of skills, which are determined by sub-sets of skills: 1) ways of thinking (creativity and innovation, critical thinking, problem-solving and decision making, learning to learn and metacognition), 2) ways of working (communication, collaboration and group work), 3) tools for working (computer literacy, information technologies and communication literacy) and 4) living in the world (life and career, personal and social responsibility).

The most actual classification about the DS was elaborated by Van Laar et al. [10]. They, through a systematic literature review, synthesized the most important academic literature related to 21st-century digital skills (DS) elaborating the most actual classification of skills required in a digital environment. They specifically identified the digital aspects to integrate with the concept of twenty-first century skills or the human skills in the digital context that are necessary for individual employability [10]. Finally, a current studie that adopts the classification of Van Laar et al. [10] was developed by Prezioso et al. [42], which compare the Van Laar et al. classification [10] with the DS derived from interviews and job descriptions, concluding that DS are not in line with the theory.

## ***2.1 Manager's Perception***

The modern economy is increasingly based on knowledge and highly skilled human capital [43, 44] because they drive workforce organizations' competitiveness and innovation capacity [43, 45]. Indeed, the increasing complexity of modern society and the fast rate of change demands a high and flexible knowledgeable human capital

base [46]. DS are strategically relevant for all employees [47], useful for solving complex business problems [48] and improve operational performance [49]. Yet, one of the problems, highlighted in several studies, concern the manager's perception of resources and competencies needed to obtain a flowless digital transformation [18–20].

Even though most managers recognize the importance of digital competencies, they have difficulties in the identification and assessment of those competencies when consensus from other manager's is not present [50]. This is because the management of the competences, itself requires specific skills, knowledge of the subjects and the appropriate techniques to increase them [51]. Indeed, as Mezias and Starback [52] affirmed: "manager's perception concept incorporates the whole that goes into managers' understanding of their work situations". Governance, in particular, must have all the necessary skills, so that everyone works in the same direction [51]. The manager's communication skills, for example, are related to the employee's perception of the workplace and understanding of the work itself [53–58].

Several past studies put in evidence the importance covered from manager's perception. Some analyse how information system (IS) manager's perception of key IS issues derive from the signals he or she receives inside or outside the organization [59]. In particular, the model elaborated from Watson [59] identifies three classes of contextual variables and characteristics that influence perception and behaviour of the IS manager: (i) environmental (characteristics of customers, markets, and competitors), (ii) organizational (the relationship between the IS manager and the CEO, the firm's culture, the perceived strategic value) and (iii) IS departmental (departmental resources, local problems, and the quality of personnel). In addition, he discovered individual variables (related to the manager) that could influence both perception of key issues and scanning [59]. In addition, Lynn Crawford's studies explored senior managers perception about the relationship between performance against standards and the effectiveness of project management performance in the workplace [60]. In this case results suggested that competence and perceptions are influenced by factors including the nature of the context and the types of project, the personality and behavioural characteristics of both the project supervisors and personnel [60]. Another interesting study discusses about manager's perception key factor underlining how middle manager perceptions about the firm internal environment is essential to every entrepreneurial process [18].

Few researchers studied the accuracy of managerial perceptions indicating their inaccuracy, others identified errors and corrective action [52]. Specifically, Mezias et al., [52] to solve these problems suggested to train and educate managers to correct misperceptions and build robust organizations. Moreover, they identified many variables that affect manager's perception and corrective action in order to tolerate misperception [52]. One more interesting descriptive and exploratory study, from Malaysian perspective, analyse managers' perception and managers' information requirements on information management and on knowledge managers [19]. This study put in evidence that managers' perception of the skills and qualifications of information managers may depart beyond the role of an information mediator

increasing organizational performance and improving decision-making [19]. Moreover, Cheryl et al. studies analyse the different perception, between IT managers in industry and faculty in academia, about the importance of various skills for entry-level IT workers [61]. Especially considering individual skills they discovered that IT managers perception gave more importance than teachers to leadership skills, risk characteristics, entrepreneurial, hardware concepts and operating systems [61].

A recent and very interesting study was elaborated from Molla et al. in 2015 [62]. In order to understand the IT managers' perceptions, they used situational awareness theory while to identify IT managers' responses to digital disruption, they used disruptive innovation theory [62]. Situational awareness concern "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future" [63]. They put in evidence how perception, comprehension and projection, the three key concepts of situational awareness, are vital to response to the digital transformation in a proper way and useful for supporting the decision making process [62]. Another actual research, that adopted situational awareness theory, was elaborated by Prezioso et al. [23]. This study put in evidence how managers aren't often not properly aware of the DS required for a digital transformation process. In addition, they have difficulties to identify the DS present in the organization and that need to acquire to support digital transformation [23]. Specifically, managers should be prepared to take decision about the development of training to develop DS internally and acquiring DS externally [23].

Another actual research, that adopted situational awareness theory, was elaborated by Prezioso et al. [22]. This study put in evidence how managers aren't often not properly aware of the DS required for a digital transformation process. In addition, they have difficulties to identify the DS present in the organization and that need to acquire to support digital transformation [22]. Specifically, managers should be prepared to take decision about the development of training to develop DS internally and acquiring DS externally [22]. Another research, elaborated in 2019 from Van Laar et al. [26], put in evidence how perceived ease of use of ICT is considered one of determinants to the development of 21st-century digital skills among knowledge workers. Perceived easy involves "the perception of the difficulty of learning to use a particular technology" [26]. They concluded that perceived ease of use not only predicts basic technical skills but also content-related digital skills [26]. Indeed, other studies indicated that perceived ease-use is present in higher levels of ICT skills workers [64, 65] and cover an important role in the willingness to develop new skills [66].

Indeed, further research demonstrates that managers neither have skill requirements top of mind, nor have a clear understanding of the role skill development plays in organizational management practices [17]. This leads to digital skill insufficiencies that affect negatively task performance [23]. For these reasons it is of primary importance to properly plan and guide the digital transformation process through the evaluation and recognition of existing digital skills and the identification of missing

skills [67]. But to do this properly, managers should be in possess of the right competences and have a clear idea about which resources and competences they need in their team [51].

### 3 Method

The objective of our research questions is to understand what the organizational strategies are, according to managers perception, to develop and enhance digital skills.

First, the review of the literature allowed us to identify, evaluate and synthesize the most relevant academic literature concerning DS and manager's perception in order to understand the phenomenon and the literature gaps. In addition, we used the interview method to test the relevance of manager's perception on DS framework in relation to the manufacturing labour market. We linked theory and practice in order to understand if manager's DS perception is in line or not with the theory. In order to investigate these issues we decided to adopt a case-study methodology because this method is specifically appropriate for investigating how a phenomenon emerges and generate contextualized explanations [68]. Moreover, when the boundaries between phenomenon and context are blurred, as in this case, this methodology is the preferred one [68] because allow the understanding and identification of different phenomenon dimensions [69].

Thanks to this qualitative research method managers and senior executives, working in a multinational company operating in a manufacturing sector, can express their individual perceptions on DS providing a-depth understanding on the organizational strategies to develop and enhance digital skills. In the majority of existing skill measurements, people are asked to evaluate how well they perform some skills presenting them a list of those skills [70]. This is the reason why these types of measurements typically collect data based on people's own estimations or perceptions of their digital skills [71].

#### 3.1 *Sample Selection*

In this paper, we analyse a multinational firm operating in a manufacturing sector and present in 18 countries: Argentina, Brazil, China, Colombia, France, Germany, India, Indonesia, Ireland, Italy, Mexico, United Kingdom, Czech Republic, Russia, Spain, United States, Switzerland and Thailand. The firm is divided into 12 different departments each of which has different roles, objective and tasks. We called this firm "Digital" because we are not allowed to disclose the name. Digital's first investments in robotics, automation, training as well as educational courses for the employees date back to more than 35 ys ago. Thanks to these constant investments over the years, it has achieved extraordinary production results, developed a fully automated

warehouse where people and robots work together and become the market leader. What 30 ys ago was produced in a year is now produced in a single day. Only last year, Digital invested \$75.3 million in 2018, \$68.2 million in 2017 and \$66.2 million in 2016 in R&D; precisely the 7% (Company's Annual Report, 2019) of its profits. The aspects that convinced us to choose this company for our study are precisely the continuous investment in R&D over the years and the increasing number of specialized personnel engaged by this firm.

### ***3.2 Data Collection***

Data collection strategy is divided into three different steps; we collected multiple sources of data to establish construct validity [68]. First, in order to obtain background information about the firm, sector to which it belongs and process of designing and deploying skills, we collected information from journal articles, firm internal documents, firm annual reports, databases, firms' official websites. Second, we gathered all firms' job descriptions (internal document) which are analytical written descriptions present for each organizational position containing the main characteristics of the position itself. These characteristics include name of the position, position in the organization chart, roles, main purposes, tasks assigned, skills required and relationships with other organizational positions. The job description is helpful for different reasons. It's a practical tool useful for the recruiting process and for the job interview to assess the matching between the ideal role that line managers have in mind and the candidate's profile, it's the base of any form of job posting, offers a clear image of the person who covers that position and presents a clear image to candidates. In addition, the job descriptions were particularly useful because they allowed us to efficiently and effectively identify the most suitable sample for our case study. Thirdly, as our principal source of data we conducted open-ended interviews with managers and senior executives of all departments of a multinational firm to ensure that we obtained multiple perspectives. Our goal is to develop a deeper understanding of the importance of the various digital skills of the twenty-first century according to managers' perceptions.

### ***3.3 Semi-Structured Interviews Procedure***

Interviews have been collected in 5 different production sites, 2 in Germany, 2 in Italy, and 1 in Switzerland. First, the company managers were informed of our arrival and the need to conduct interviews by the human resources department, with whom we had been working for a year. After that, the human resources department indicated the most experienced managers to contact for each department, to whom an email presentation was sent with a request for an interview. Once a positive response was received, a meeting date was set. We carried out 57 interviews, 53 interviews were



face-to-face while 4 through Skype call. Interviews were conducted 37 in Italy, 18 in Germany and 2 in Switzerland between October 2018 and September 2019. The length of the interviews was between 13 and 75 min and the questionnaire was related to specific topics for the employee's DS. We adopted an inductive approach to determine what the participants brought to the study. Specifically, the interviews followed a semi-structured protocol that is structured in three part. In the first part we ask generical question about previous work and educational background, in the second one asks specific questions about firm's digitalization strategies and employee DS for the digitalization process and in the last part we ask to identify the most important DS, those missing and those to be developed necessary for the digitization process. Specifically, in this research we focus on the last part of the questionnaire, examining what are the most important organizational strategies perceived from interviewee. We used as a guideline the DS framework elaborated from Van Laar et al. [10] that was presented by presenting a card with each skill written on it with a short description. Specifically, we asked to the interviewees to identify the organizational strategies that they perceive as important, to develop and enhance the digital skills. Before each interview, it was clearly communicated to the interviewees that the data and results of the interviews would be treated confidentially and the informed consent of the participants to be interviewed via audio recorder was also requested. When we didn't allow to record the interview, we fully transcribed every detail during the interview, in order to preserve the veracity of the interview reports and conversations. Moreover, the transcriptions were submitted to interviewees for verification. The questionnaire is available upon request. Sample selection was carried out in order to ensure theoretical replicability [68] also the responses received during the interviews reflect the particular point of view of the respondents.

## 4 Data Analysis Procedure

In this study we analysed the manager's perception of organizational strategies to develop and enhance DS. We used a deductive to determine how participants perceive the theoretical construct approach, which we based on the literature. The theoretical constructs are the most used strategies, namely, training, talent and map of competencies, skills gap analysis, recruiting, long term strategy, job description analysis, coaching, job rotation, pilot project, and employer branding.

Moreover, during the interviews with managers was presented a card list, with a short description written of each digital skill, asking them if they recognized the skills as relevant and what the right the strategies are to develop and enhance these skills. On the base of their responses, we elaborated Table 1, dividing the data according to the pieces of evidence collected thought the interviews. We used Table 1 as a starting point of our data analysis and discussion. Table 1 is divided in 2 columns, on the left part we find the strategies that interviewees declared as important, to develop and enhance DS, during the interviews. While on the right part of the table, it is possible

to observe the frequency of respondents itself divided into 2 columns: number of employees interviewed and the percentage of response for each strategy.

## 5 Findings and Discussion

Table 1 illustrates the results of our case study. Managers consider the development of digital skills in organization as long-term strategy ( $n = 7$ ). Managers consider the training ( $n = 25$ ) as the most useful strategies to enrich digital skills within the organizations.

Training are often organized by the management and technology developer during the adoption process of technology. Training aims at providing workers the proper digital skills to work with novel technologies [72, 73], and training can be proposed as refresher courses when digital technologies are retrofitted and workers need new digital skill to manage them. Coaching are also a popular strategy to develop digital skills to workers. Indeed, coaching are often used together with training. Coaching ( $n = 11$ ) involves training-on-the-job or mentorship, where skilled workers help workers to learn digital skills to work novel technologies. The coaching can be proposed again when workers perform below standard for certain activities in order to increase their competencies to conduct the activities and work with the technologies [74]. Job rotation and pilot projects are few used to build digital skills in organization, and this indicates that digital skills are mandatory for each activity within the organizations rather than to be useful to certain tasks.

Moreover, talent and competence maps, skills gap analysis and job description analysis are not prominent strategies to build digital skills for the manager's perception. The first two strategies are as a purpose to check skills and competencies of the organization in order to find possible gaps of competencies of workers. Instead, the

**Table 1** Results of the multiple case study

Strategy	Frequency	
	n	%
Training	25	44,6
Talent and map of competencies	2	3,6
Skills gap analysis	2	3,6
Recruiting	6	10,7
Long term strategy	7	12,5
Job Description analysis	1	1,8
Coaching	11	19,6
Job rotation	1	1,8
Pilot project	1	1,8
Employer branding	0	0
Total	56	

latter aims at detecting the needed digital skills through the analysis of the activities and tasks related to each job. This evidence confirms the extant literature which shows the difficulties of managers to plan the development of digital skills [50]. Indeed, the results show that strategy to acquire digital skills happen during the adoption of novel technologies by training and coaching rather than planning their acquisition a priori.

Furthermore, the recruiting strategy is useful for organization to acquire novel digital skills hiring novel workforce. The findings show that this strategy is less preferred compared to the training and coaching. This means that the organization, which we analysed, has a propensity to build digital skills to workers which have hired and possessing technical skills. Thus, the acquisition of adequate digital skills is transformed into job opportunities [12] because they have both technical skills and skills to manage novel technologies which make the workers ready to change [33, 35]. In line with this, managers do not consider the employer branding, which is, long-term strategy to manage the awareness and perceptions of employees, potential employees, and related stakeholders of a particular firm [75]. In modern economy employer branding is the promotion of the brand within and outside the organization and provides a competitive advantage to externally acquire, nurture and retain talent internally [76]. Promoting this strategy will lead internally to increased employee loyalty, while externally it will make the organization attractive to potential employees with specific skills [76]. For this strategy further research is needed to explore how this strategy are an effective way to attract DS talents and what actions an organization can develop to facilitate it.

## 6 Conclusion, Limitation and Future Studies

In this paper, we analyse manager's DS perception of a multinational firm facing digital transformation and operating in the manufacturing sector. The aim of the paper is to identify, according to manager's perceptions, the most relevant organizational strategies to develop and enhance DS within organizations. Integrating results derived from data and Table 1 is possible to observe how manager's perception organizational strategies to develop and enhance DS is focus on training, recruiting, long term strategy and coaching. Specifically, 44,6% of the interviewee, declared that training is the most important strategy to adopt in order to develop DS. Moreover, analysing the responses received during the interviews is evident that is present a lack of the right organizational strategies perception to develop DS. Expressly, no one declared the employer branding strategy as important. This strategy was appointed during the interviews but was not identified as important to develop DS. In addition, only a small part of the interviewee named talent and map of competencies, skills gap analysis, job Description analysis, job rotation and pilot project as important.

Most studies, in the industries context, analyse user behaviour, new business models or new technological developments neglecting the fundamental soft factor of the employees' skill level, necessary for the development of innovation capacity as

well as for the adoption of technological and organizational changes [77]. Our results confirm past studies where managers do not seem to have a clear and well-defined managers' perception about which skill education and training in industries require [17] and which competences, resources and strategies they need in their team for undertaking digital changes [23]. This is worrying because it is the responsibility of managers to guide their employees appropriately, identifying specific knowledge requirements, capabilities and personal attributes for each role so that each employee effectively contributes to the job. Our recommendation to managers and organizations is to spend more time and attention to understand and adopt the right strategies, observing and analysing skill insufficiencies, developing digital skill profiles for each job function in order to succeed and stay competitive and develop day by day DS. Specifically, managers need to realize that DS must be continuously improved as a strategic factor [78] and it is of fundamental and strategic importance for organizations to priorities DS development strategies [17]. Organizations must recognize that the management of the competences, itself requires specific skills, knowledge [51]. For these reasons, it's of fundamental importance put in action corrective action through education and training. In addition, it's essential inform managers about every organizational and environmental properties and novelty in order to detect misperception or problems and build a strong organization [52].

### ***6.1 Implications for Practitioners***

This study is relevant for practitioners because findings indicate that managers and organizations can use the presented framework for evaluate, detect and verify digital strategies in order to obtain a flowless digital transformation. Human resources and managers of each department can benefit from a more explicit description or from the creation of a digital profile for each job function in order to fill the gaps of the skills that are needed by their employees, improve personnel selection, realize an appropriate workforce planning and reflect the real need of the firm. Moreover, considering that managers have difficulties in finding the right people with the right skills [79], the identification of strategies to develop the right DS for each department allow HR managers and recruiters to acquire the most talented workers, to retain the personnel already acquired and create the right workforce team. In addition, this framework gives more information and clarity to organizations and their employees about the content of ICT-related job aspects. This is important, particularly for senior workers, because if people don't understand why change is important, they will be reluctant to change [80, 81] and adapt their skills to the digital environment.

## 6.2 Implications for Researchers

The study has certain implications for researchers. Further researchers should address the lack of evidence related to manager's perception about the employer branding strategy. We encourage researchers to conduct qualitative studies – especially multiple case studies – in order to contribute to the knowledge accumulation of this strategy. Another fascinating research avenue is to investigate how organizations combine these digital skill strategies in order to develop a long-term strategy, and therefore, to investigate the value creation of these strategies. Our study is a qualitative, embedded single-case study of a multinational located in Europe. Thus, the results are mainly generalizable for European organizations. We encouraged researchers to conduct a similar study in different contexts, such as Asian, American companies in Germany and in organizations with different sizes. In addition, future research can explore these limitations in order to understand if in a different business sector or in another manufacturing industry the manager's DS perception is in line with our study or not. Could be useful to understand if any correlations exist between manager's strategies perception and cultural aspect of the organization. Also, future research could investigate manager's strategies perception in small and medium enterprises respect big firms, the nationality, the culture and the age. This research is subject to some limitation, due to its exploratory nature. First, the small sample size, we collected data from a single multinational firm operating in a manufacturing sector and it's the reason why it's difficult to generalize our findings to all manufacturing industries or to different industries o countries. Second, this study gives a static view of the phenomenon because it doesn't take in consideration the possible cyclical variation of strategies and due it's cross-sectional rather than a longitudinal nature of managers in order to understand if and how these variables affect manager's DS perception. Also, further future studies could derive from the analyses of similarities and differences of different subsectors [82].

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