



Workforce Competencies and Digital Transformation: A Literature Survey

Tazeen Imran^{1*}  | Dr. Sara Khan²  | Hareem Siddiqui³  | Dr. Saqlain Raza⁴ 

Abstract

The 21st century is an era of disruption, vanishing entities lagging behind to transform themselves. Digital transformation therefore has gained much recognition especially in the 21st century, as the technological advancement assists in significantly optimizing business operations, product service and design innovation. Organizations around the world are investing and making constant efforts in digital transformation by updating and upgrading their business processes in order to improve the firm's performance and achieve competitive advantage. However digital transformation requires the workforce to possess adequate competencies, both for implementation and utilization post implementation, as these technological changes bring intense shifts in the attitude and behaviour of the traditional ways of doing. This paper, therefore, attempts to bridge the gap in literature for the changing needs of today's workforce competencies that are deemed necessary in the era of digital transformation, by gathering evidences from literature analysis. The paper contributes to the body of literature by directing industry practitioners and researchers to adopt a wider outlook, while undergoing the journey of digital transformation, which encompasses diversity in workforce competencies. The researcher has discussed diversity and digital transformation, with the perspective of what digital transformation needs is what gender diversity offers.

Keywords: Digital transformation, Diversity, Workforce Competencies

Author's Affiliation:

Institution: Shaheed Zulfikar Ali Bhutto Institute of Science and Technology¹⁻³⁻⁴ | Institute of Business Administration²

Country: Pakistan

Corresponding Author's Email: *tazeen.imran@szabist.edu.pk

The material presented by the author(s) does not necessarily portray the view point of the editors and the management of the ILMA University, Pakistan.

(Online) 2409-6520 (Print) 2414-8393, published by the ILMA University, Pakistan.

This is open access article under the  license. <https://creativecommons.org/licenses/by/4.0/>

INTRODUCTION

Digital transformation has recently been a topic of great interest for researchers and industry practitioners (Jedynak et al., 2021; Vial, 2019) due to its strategic importance, compelling organizations to undergo this transformation due to newly emerging technologies (Fonseca & Picoto, 2020; Matt et al., 2015). It has been discussed from a diverse outlook spanning from digital technologies (Flores et al., 2020; Westerman et al., 2011) to profound business processes (Demirkan et al., 2016; Henriette et al., 2016; McCarthy et al., 2021) yielding quality economic (Ebert & Duarte, 2018; Foerster-Metz et al., 2018; Hanelt et al., 2021), social (Ebert & Duarte, 2018) and environmental (Felsberger et al., 2020; Hanelt et al., 2021) outputs with a common factor of dynamic business environment (Bajpai & Biberman, 2021), a resultant of the dynamic workforce (Schuchmann & Seufert, 2015) available to the organization, as the usage of such technologies is dependent on the workforce. The idea of a dynamic work force is an expansive concept, describing a work force being fluid in terms of skills adaptation (Schwarz Müller et al., 2018), creativity (Foerster-Metz et al., 2018; Schwarz Müller et al., 2018) and innovation (Loonam et al., 2018; Vial, 2019) as well as problem solving competencies (Schwarz Müller et al., 2018). The human brain has an impeccable ability to innovate, develop and respond to the changing needs and times, while, on the contrary, the rapidly changing technology surpasses the previously adopted technological practices (Sexton et al., 2005; Vial, 2019). Hence, a company striving to achieve sustainability, in an era where business structures are constantly being remodelled, desperately needs a stable and reliable resource; the employees. This, hence, clearly highlights the reason why competent work force playing roles in digital transformation has been such an enthusiastically researched topic lately (Fonseca & Picoto, 2020). Moreover, the recent Covid-19 pandemic has further endorsed digital transformation to be the essential need of every organization (Agostino et al., 2020), making employees equally competent and productive while working from home, being equipped with relevant technological as well as soft skills.

Dynamic capabilities approach has become one of the most prominent streams for research in the literature of strategic human resource management, as it explains how organizations respond to rapid technological and market changes (Eisenhardt & Martin, 2000; Helfat & Peteraf, 2009; Stefano et al., 2014; Teece et al., 1997). It also has a promising future for further research in addition to assisting management striving to gain competitive advantage in increasingly challenging environments as well as strategizing for transforming digitally. While undergoing strategic change, identification of stakeholders' needs and their involvement in the process is significant. In this regard, the stakeholder salience theory is important since it emphasizes on the response of an organization to changing needs and demands of internal and external stakeholders (Järlström et al., 2018). Therefore, it seems important to examine the literature in light of dynamic capabilities and stakeholders' salience approach to better understand the concept of workforce competencies and digital transformation.

The contemporary literature provides evidence for the relationship between digital transformation and workforce competency (Murawski & Bick, 2017; Osmundsen,

2020), however, it reflects a gap in explaining the diverse nature of skills which are deemed essential to be developed among employees for a successful digital transformation. A study by Fonseca and Picoto (2020) is important in this regard, as it stresses upon the need to focus on soft skills along with technical skills. However, it has been observed that the literature lacks due deliberation while bringing to light the essence of the human talent for its diverse nature. Here, it is important to consider that it is not only technological efficiency that matters, rather skills from a wider outlook emerging from the humanistic approach offers long lasting success. Hence, a surprising omission has been observed in the literature in terms of exploring soft skills (Cetindamar Kozanoglu & Abedin, 2020), such as emotional quotient (Flores et al., 2020) and cognitive skills (Gfrerer et al., 2021) from a gender perspective. Since the soft skills are found to be varying among employees with respect to gender, it is essential to integrate the phenomenon of diversity with digital transformation to gauge the effectiveness of gender difference in this process (Gfrerer et al., 2021). On the other hand, the conceptualization of digital transformation also seems to differentiate on the basis of organizational perception of its utility (Henriette et al., 2016; Mergel et al., 2019). While some refer to it as a process innovation for business operations, the others explicate digital transformation from the stakeholders' perspective (Henriette et al., 2016; Mergel et al., 2019; Reis et al., 2016). Thus, it demands literature to offer a consolidated approach to define the concept. Therefore, the current research is aimed at reviewing the extant literature on digital transformation from the perspective of workforce competencies. This overarching purpose will guide to answer the following questions:

RQ1: How does the literature define digital transformation?

RQ2: How does contemporary literature on digital transformation embed workforce competencies?

RESEARCH METHODOLOGY

The current research attempts to bridge the gap in literature regarding the changing nature of workforce competencies needed in the era of digital transformation by gathering evidences from literature analysis. This literature survey focuses on the practices and application of digital transformation for its utility to the business environment while highlighting the potential gaps in the available literature for proposing insightful directions for future investigation. The goal of this research is to analyse the literature on digital transformation by integrating the role of workforce competencies in organizational setting by augmenting the debate to employ humanistic approach for the application of the concept in industry. Therefore, purposive sampling has been used to select articles from emerging journals for instance, Emerald, Wiley, Elsevier, JSTOR, Taylor & Francis, Science Direct, MIS Quarterly Review and MIT Sloan Management Review searching keywords like “digital transformation”, or “workforce competencies” or “diversity” or “workforce competences and diversity” or “digital transformation and diversity” among title and abstract. Since digital transformation is a recent phenomenon, the articles published during the years 2000 till 2021, with a focus on the conceptualization of digital transformation and its integrated role with workforce competencies have been reviewed. This literature survey is important in its unique approach to present the integrated phenomenon of digital transformation with workforce competencies

for guiding future researchers, industry practitioners and relevant stakeholders willing to embark upon the journey of digital transformation.

LITERATURE REVIEW

Digital Transformation

Digital transformation is a massive tool for sustainable development in 21st century business organizations (Felsberger et al., 2020). Digital transformation is taking place at an unprecedented pace by providing a better connected world and offering new and unique opportunities to businesses for growth and value creation (Mahraz et al., 2019). COVID-19 has also played an important role in accelerating the pace of digital transformation (Agostino et al., 2020; McCarthy et al., 2021). The focus of literature on digital transformation is two folded; firstly it emphasises on understanding the term digital transformation, secondly, highlighting its due importance in the recent business world while discussing the challenges associated with this transformative journey.

While many authors have attempted to define digital transformation, however it is observed that there is a void in reaching a common agreement for a universal concept of digital transformation (Hanelt et al., 2021; Reis et al., 2016; Warner & Wäger, 2019). To some of these researchers, digital transformation is about restructuring business operations to make them more efficient, (Henriette et al., 2016; Hess et al., 2016) and/or achieve competitive advantage (Mahraz et al., 2019; Spremic, 2019). Mahraz et al (2019) propagates that digital transformation integrates all of them since it is a disruptive and incremental process not only affecting the employees but also customers (Mahraz et al., 2019; Reis et al., 2016). Table 1, attached in the Appendix, presents a few of these definitions.

It is important to note that the definition given by i-SCOOP (2019) represents a holistic view of digital transformation claiming it to be an overall process, not just technology, which affects every sector and member of a company. Since it encompasses technology, structure and output, the central focus of digital transformation is competent people who run the organization and attain its strategic objectives.

Digital transformation increases efficiency, catalyses process, enhances performance (Foerster-Metz et al., 2018), multiplies output (Mergel et al., 2019), as well as provides sustainable competitive advantage. There has been a strong connection between digital transformation and the industry environment (Reis et al., 2016). Organizations are confronted with the challenge of adjusting the prerequisite of the external environment with the internal capabilities and resources including human resource, adaptable to the changing needs in the process of digital transformation, ultimately giving competitive advantage to the company (Jedynak et al., 2021). Another major challenge is the integration of “digital” into the DNA of the business models which is essential for the success of an organization and critical for the management to handle (Reis et al., 2016). This process is extremely essential and may require a high level of change management, as it is experienced that initiatives

which cannot be associated with an organization's DNA, may have a shorter life and not achieve the intended benefits.

Even though changing a company's basic structure (Boneva, 2018), processes (Boneva, 2018) and workplace setup (Mergel et al., 2019) is quite challenging itself, nonetheless, most of the adjustment needs to be made around the workforce and its competency (Lei & Jing, 2016). Niar (2019), posits that the digital talent gap is widening because of lack of efforts in upskilling employees by organizations despite of fast moving technological advancement. In this regard, an important viewpoint by Boneva (2018) holds significance since it proposes an integrated criteria to overcome the challenges based upon the changes carried out in key abilities and skills, managers' styles of leadership, developing shared channels, values and approaches in order to interact with vendors, partners, as well as customers. Also, the overall integrated and holistic nature of digital transformation (Wiesböck & Hess, 2020) make it a time consuming draining process. Hence, it should be a company's utmost priority to ensure that the transition from manual methods and systems to digital ones is a smooth process that does not effect a company's performance during the years it takes to establish and develop a new foundation which is similar in concept but quite contrary to manual systems in terms of use and handling (Agostino et al., 2020).

Table 1 Definition of Digital Transformation

Definition(s)	Author(s)
Digital Transformation is the use of technology to radically improve performance or reach of enterprises.	Westerman <i>et al.</i> (2011)
Digital Transformation is the use of new digital technologies, such as social media, mobile, analytics or embedded devices, in order to enable major business improvements like enhancing customer experience, streamlining operations or creating new business models.	Fitzgerald <i>et al.</i> (2013)
Digital Transformation strategy is a blueprint that supports companies in governing the transformations that arise owing to the integration of digital technologies, as well as in their operations after the transformation.	Matt <i>et al.</i> (2015)
Digital Transformation is the profound and accelerating transformation of business activities, processes, competencies, and models to fully leverage the changes and opportunities brought by digital technologies and their impact across society in a strategic and prioritized way.	Demirkan <i>et al.</i> (2016)

Digital Transformation is concerned with the changes digital technologies can bring about in a company's business model, which result in changed products or organizational structures or in the automation of processes. These changes can be observed in the rising demand for Internet-based media, which has led to changes of entire business models (for example in the music industry).	Hess <i>et al.</i> (2016)
Digital transformation is adopting disruptive technologies to increase productivity, value creation and social welfare.	Ebert & Duarte (2018)
Digital transformation is the evolving pursuit of innovation and agile business and operational models – fuelled by evolving technologies, processes, analytics, and talent capabilities – to create new value and experiences for customers, employees and stakeholders.	Solis (2019)
Digital transformation is a profound transformation of business and organizational activities, processes, competencies and models to fully leverage the changes in opportunities of a mix of digital technologies and their accelerating impact across society in a strategic and prioritised way, with present and future shifts in mind.	i-SCOOP (2019)

Workforce Competencies in relation to Digital Transformation

A workforce competency is attributed to the combination of abilities, knowledge, skills and experience in a person, which are essential to ensure a successful performance, both in life and in the workplace (Flores et al., 2020). With respect to the field of HRM, the concept of digital transformation conclusively revolves around process management as well as the people (Ilvonen et al., 2018; G. Kane, 2019; G. C. Kane et al., 2016; Kohnke, 2017; Spremic, 2019) being an important pillar of this process (Jedynak et al., 2021). Therefore, the concepts of managing employment (Berkelaar & Buzzanell, 2015), administration, development and training, and performance management (Dalessandro, 2018) are focused upon in researches pertaining to digitization. Hence, it comes down to a common indicator of a competent and able workforce which is needed to drive the whole transformation process (Singh & Finn, 2003). The crux of these research findings indicates that this technology, no matter how powerful, is pointless on its own while it is highly

profound and relevant only if it is made to empower and favour human.

Because of the essence of human expertise and skills to establish and work with digital system, a company's ability to retain and hire talented, suitable and well versed employees is a make or break factor for their progress and effectiveness (Jedynak et al., 2021). It is generally believed that digitization encourages and strengthens innovation that leads to gain productivity for organizations (Gfrerer et al., 2021). Nonetheless, without the element of "human factor" the benefits and its related advantages cannot be realized (Kohnke, 2017). This is augmented by Parida et al (2015) as well as El-Khoury (2017) that digitization requires people who use and extrapolate more from their knowledge to improve productivity and efficiency. This is an interesting point congruent with the significance of human factor discussed above, connoting humans to remain relevant always despite the gradual rise in robot led cultures (DiRomualdo et al., 2018; El-Khoury, 2017). Malinowski et al, (2008) and Sexton et al, (2005) have both discussed about managing the revamped processes and newfound company structures in effective ways, which goes to prove that a work force managing constantly changing environment needs to have the calibre of grasping these complex systems.

Keeping this view in mind, a competent workforce is important because people with par skill and understanding (Malinowski et al., 2008) will always be needed with the creation of technologically upgraded jobs while the older ones being redundant. Kane (2019), in his research accentuates that it is a fallacy to believe that since digital technologies are the cause of challenges in businesses so the solution also lies in the same. In fact it is people who will either "fuel" or "thwart" the digital transformation. Kohnke (2017) calls workforce competency as the underpinning of digital transformation. According to Osmundsen (2020), the underpinning for any development in Information Systems are the capabilities a workforce possesses to use these systems.

An important question that frequently arises in researches ,after deducing observations based on the definition, is how workforce capabilities and competencies are to be balanced (Peppard & Ward, 2004). Often, researchers portray great confusion when attempting to weigh the two terms on the same balance. In this attempt, Peppard and Ward's (2004), research was able to define the relationship between capability and competency with discipline and clarity. There are two types of capabilities in an organization: the capabilities of the work force which refers to the talents and skills they possess (Butschan et al., 2019; Vial, 2019), and the capability of the organization as a whole to carry out the process of and progress in digital transformation. What connects these two capabilities is competence. The ability of the workforce to apply its capabilities (i.e. skills and talents) makes it a competent one (Butschan et al., 2019). And a competent workforce is what makes the organization itself reach standards and capabilities high enough for them to continuously develop and remain relevant in their process of digital transformation. The researcher agrees with this connection and refers to organizational capability as its ability to "implement digital business concepts" (Wiesböck & Hess, 2020), which is basically the idea this current research is describing as competence. It is hereby important to corroborate that the workforce must not only be capable but

also competent enough to ensure a company's survival amongst its rivals. Similarly, (Flores et al., 2020) also proposes that competence is a combination and a balance set between five main skills: hard/technical skills (Nair, 2019), soft skills (Nair, 2019), cognitive skills, emotional skills/quotient, and digital skills. Where all of these hold significant value in carrying out a successful digital transformation, from the researcher's viewpoint, the three skills to be prioritised are technical, cognitive and emotional skills.

When it comes to technical skills, it is proven through research that as long as a person is trained for the task, the diversification based on cast, creed, religion, ethnicity and gender are not contributing factors. It further added that had they been trained and educated sufficiently, they could also reach high positions and be equal to their male colleagues (Akano, 2013). This finding was seconded by another author stressing upon the importance of equality of opportunity for women as prejudice and lack of training were the only factors hindering their expertise and performance (Daley, 2021).

Cognitive skills refer to ability to think, reflect and learn (Butschan et al., 2019). Companies, that frequently undergo rapid changes, view cognitive skills as favourable pedestals for their growth, as an able person, who reflects and analyses, allows the company to have him tap his potential to the utmost. The only problem such application brings is that if all employees apply their knowledge the same way, then a company can drown in monotony. Different experiences and educational backgrounds bring different viewpoints (Østergaard et al., 2011). Another research further elaborates that gender diversity, which also encompasses cognitive diversity, provides an organization with the exact assets required by them to be successful in their digitalization process, as well as deliver a system that is effective, robust and catering to the business needs and environment (Gfrerer et al., 2021).

Another question arises here as to what controls a person's thinking and directs him to cognitively apply his/her technical skills in ways that almost always benefit the company. This is where emotional skills emerge as essential catalysts for driving change and unique viewpoints. Emotional skills refer to the "drive" in an individual which directs their behaviour (Meshkat & Nejati, 2017). Another research explains it as a person's ability to regulate, understand and perceive emotions, to lead one's thinking and, therefore, actions (Prentice et al., 2020). Therefore, cognitive and emotional skills need to work in tandem with each other in order to deliver a significantly improved output.

However, the gap emerging in previous researches is not confined to the relationship between ability and its action. An important area where there is a significant lack of research is how to develop this competency in capable people (Butschan et al., 2019). Where it would be ideal to hire competent employees, it would perhaps be a more favourable initiative to provide opportunities for employees to contribute towards company's strategic goals. A company needs to progress in "fostering the employees' self-organization", as rightly stated by (Schuchmann & Seufert, 2015). The gap in solutions for lack of competency can be filled by having organizations realise that it is their responsibility to have the workforce implement their skills

in relevant and efficient ways (Kyllonen, 2013), to come up with the best digital solutions (Kettunen & Mäkitalo, 2019), especially because that company's capability is to be set in digital transformation, which is a major shift and a draining process. Companies are forced to look beyond technology and consider people who have the right skills (Sousa, 2019) and mindset to use these technologies (Goldman, 2017). Such people allow companies to rethink their business and method strategies in order to respond to the challenges digital transformation imposes (Fonseca & Picoto, 2020). Therefore, it is justified to propose that, due to capability needing to be transformed into competency, which inevitably engages all aspects of a person and organization, digital transformation is and should only be defined as a process that encompasses all aspects and competencies of its organization.

The need of Diversity in Digital Transformation

A research states that in order to carry out a successful digital transformation, a company needs to secure people with necessary talents and skills so that they can capitalize on digital structures and trends (Ismail et al., 2017). This relates to the idea of a company's workforce competency (Malinowski et al., 2008; Parida et al., 2015). It further adds that an organization needs to create an environment "where the best people want to work". It reflects that the criteria for hiring is talent and expertise, which companies need to value (Herring, 2009). The idea of diversity being a "talent solution" is supported by Beechler & Woodward (2009). The questions that arise with such suggestions are pertinent to the extent of effectiveness of a diverse workforce and whether what diversity brings to the table is even relevant and necessary for facing challenges of digital transformation. Hess & Matt (2018) stated in their research that innovation and value creation cause companies to revamp their entire structures and models, which is also backed by Reis et al. (2016). In simpler words, innovation drives change. This notion is parallel to the pace at which the world is changing with digital transformation catalysing the speed of change. Flores et al. (2020) stressed on the idea that humans are the leading factors for change and revolution, hence the role they play in transformation are of key importance.

Several researches have proven that diversity, especially gender diversity, allow for different perspectives and, hence, a lot of creativity and innovation. This stems from the fact that women and men are psychologically different (Matlin, 2012). An example of this can be reflected through a belief that women are more experience oriented whereas men are more goal oriented. This ties chains with the links formed between cognitive and emotional skills, both of which affect a person's approach and hence, stems from psychology. What separates gender from all other types of diversity is the fact that men and women, naturally, have a different psychological makeup which is part of them identifying as each gender (Matlin, 2012). Most other forms of diversity have differences in thinking due to environmental factors such as culture, religion and experience, and are not necessarily programmed to have a certain approach to thinking itself, as is the case with genders. Therefore, a gender diverse work force can easily bring forth fruitful results.

While striving to implement the best solutions for problems, combating chaos and uncertainty during the process, availability of diverse solutions to problem is needed in order to allow the company great thoroughness and deep reflection (Beechler & Woodward, 2009). A strong and stable emotional quotient aids the workforce to handle the opposing ideas and the pressure to achieve even greater refinement and perfection within an organization. A gender diverse workforce, this way, also develops and advances one's cognitive skills. This, in turn, allows a company to innovate as well as perform at its best, both of which are needed for it to survive through a digital transformation and beyond with a competitive advantage. With such results kept in mind, it is fair to say that the demand for innovation and consistency by a company undergoing digital transformation is fulfilled by a gender diverse workforce.

Theoretical Underpinning

The current research has founded its ground on the resource based perspective which was described by Penrose (1959). This approach connotes employees as the company's bundle of resources and gave an effective management theory to these resources which allows companies to create competitive advantage (Felsberger et al., 2020; Penrose, 1959). Dynamic capabilities as defined by Helfat & Peteraf (2009) is based on innovations in organizations providing 'a capacity to create, extend and modify' the company's resources, where resources along with tangible and intangible assets also includes human assets (Helfat & Peteraf, 2009).. Thus, an organization is required to upskill "the capacity to sense and shape opportunities and threats, to seize opportunities and to maintain competitiveness through protecting, enhancing, combining and, where necessary, reconfiguring the business enterprise's tangible and intangible assets" (Denrell & Powell, 2016; Teece, 2007). The literature found an interesting alignment between dynamic capabilities and digital transformation, with the first acting as a conceptual base or foundation and the latter being viewed as a phenomenon of great interest (Vial, 2019). This directly implies that digital transformation, and the technologies included are just vectors for improved workforce competence and performance (Schilke et al., 2018).

Since organizations are open systems, they become subject to the issues and needs of a variety of stakeholders, that serve as prominent contributors with respect to long term success, performance and, hence, survival of the organizations. Mitchell et al., (1997) has also endorsed this notion in his stakeholders' salience theory. The researcher defines a stakeholder as any group or individual being affected by organizational policies, practices and strategic decision making (Mitchell et al., 1997). The salience of stakeholders also provides a strong theoretical base when the inflow of technology in the form of digital transformation is being analysed. Catering customers in an uninterrupted and a fast manner to have a wider and bigger customer base, attracting more investors for financial stability and acquiring business practices responsible for sustainability; all these have made the organizations realize the dire need of adopting technological advancements in today's world (Järlström et al., 2018). Furthermore, there has been observed a frequent change in the customers' demands, expectations and preferences and employees have also started to grow and develop their thinking skills, standards and aspirations. This

progression in the employees' thought processes, geared by the changing needs of the customers' desires and wants have urged the organizations to start focusing from the viewpoint of all its stakeholders by reviewing the systems, policies, procedures, technologies and the general work environment to satisfy the workforce as well as the customer base.. This, again, brings forth that, for constant and uninterrupted satisfaction of all the stakeholders, where technology plays an effective and crucial role for all the people having a stake in the organization, gender diversity is equally prevalent in any organization looking for innovation and creativity as well as to become extraordinary.

Table 2 Sources of Literature

Article	Name of the Journal	Link
New development: COVID-19 as an accelerator of digital transformation in public service delivery	<i>Taylor & Francis</i>	https://doi.org/10.1080/09540962.2020.1764206
Gender equality in skills development: How to find a balance	<i>OASIS, Common Wealth of Learning</i>	http://oasis.col.org/bitstream/handle/11599/1886/2013_Oyakhiromen%26Akano_GenderEquality.pdf?sequence=1&isAllowed=y
The global “war for talent.”	<i>Journal of International Management,</i>	https://doi.org/10.1016/j.int-man.2009.01.002
Challenges related to the digital transformation of business companies	<i>Innovation Management, Entrepreneurship and Sustainability</i>	https://www.ceeol.com/search/chapter-detail?id=690762

Tackling hurdles to digital transformation - the role of competencies for successful industrial internet of things (iiot) implementation.	<i>International Journal of Innovation Management</i>	https://doi.org/10.1142/S1363919619500361
Recruitment Tools for Reaching Millennials: The Digital Difference	<i>International Journal of Qualitative Methods</i>	https://doi.org/10.1177/1609406918774446
<i>Women in tech statistics show the industry has a long way to go</i>	<i>Daley, S. (2021).. Builtin.</i>	https://builtin.com/women-tech/women-in-tech-workplace-statistics
Digital Innovation and Strategic Transformation	<i>IT Professional, 18(6)</i>	https://doi.org/10.1109/MITP.2016.115
Dynamic Capability as a Theory of Competitive Advantage	<i>In The Oxford Handbook of Dynamic Capabilities (Issue June 2018).</i>	https://doi.org/10.1093/oxford-hb/9780199678914.013.007
HR in the digital age: how digital technology will change HR's organization structure, processes and roles	<i>Strategic HR Review, 17(5)</i>	https://doi.org/10.1108/shr-08-2018-0074
Digital Transformation	<i>IEEE Software, 35(4)</i>	https://doi.org/10.1109/MS.2018.2801537
Dynamic capabilities: What are they?	<i>Strategic Management Journal, 21(10–11),</i>	https://doi.org/10.1002/1097-

Digital Transformation and the world-class HR difference	<i>Strategic HR Review</i> , 16(2)	https://doi.org/10.1108/shr-01-2017-0001
The impact of Industry 4.0 on the reconciliation of dynamic capabilities: evidence from the European manufacturing industries	<i>Production Planning and Control</i> , 0(0)	https://doi.org/10.1080/09537287.2020.1810765
Embracing Digital Technology: A New Strategic Imperative Capgemini Consulting Worldwide	<i>MIT Sloan Management Review</i> , 55(1)	https://www.capgemini-consulting.com/SMR
Human Capital 4.0: a workforce competence typology for Industry 4.0.	<i>Journal of Manufacturing Technology Management</i> , 31(4)	https://doi.org/10.1108/JMTM-08-2019-0309
Digital Transformation and its Implications on Organizational Behavior	<i>Journal of EU Research in Business</i> , 2018	https://doi.org/10.5171/2018.340873
The competencies needed for digital transformation	<i>Online Journal of Applied Knowledge Management</i> , 8(2)	https://doi.org/10.36965/ojakm.2020.8(2)53-70
Digital Needs Diversity: Innovation and Digital Leadership from a Female Managers' Perspective	<i>Innovative in Times of Crisis</i> , June,	https://link.springer.com/chapter/10.1007/978-3-030-69380-0_19

Nearly half of companies say they don't have the digital skills they need	<i>Harvard Business School Publishing</i>	https://hbr.org/2017/07/nearly-half-of-companies-say-they-dont-have-the-digital-skills-they-need
A Systematic Review of the Literature on Digital Transformation: Insights and Implications for Strategy and Organizational Change	<i>Journal of Management Studies</i> , 58(5)	https://doi.org/10.1111/joms.12639
Understanding dynamic capabilities: Progress along a developmental path	<i>Strategic Organization</i> , 7(1)	https://doi.org/10.1177/1476127008100133
Digital Transformation challenges	<i>Mediterranean Conference on Information Systems</i>	http://aisel.aisnet.org/mcis2016 http://aisel.aisnet.org/mcis2016/33
Does Diversity Pay ?: Race , Gender , and the Business Case for Diversity	<i>JSTOR</i> 74(2)	https://doi.org/10.1177/000312240907400203
Options for Formulating a Digital Transformation Strategy	<i>MIS Quarterly Executive</i> , 15(2)	https://aisel.aisnet.org/misqe/vol15/iss2/6/
Reconciling digital transformation and knowledge protection: A research agenda	<i>Knowledge Management Research and Practice</i> , 16(2)	https://doi.org/10.1080/14778238.2018.1445427
Digital Business Transformation and Strategy: What Do We Know So Far?	<i>Manufacturer Article</i> , November 2017,	https://doi.org/10.13140/RG.2.2.36492.62086

Sustainable Human Resource Management with Salience of Stakeholders: A Top Management Perspective	<i>Journal of Business Ethics</i> , 152(3),	https://doi.org/10.1007/s10551-016-3310-8
Digital transformation of organizations: what do we know and where to go next?	<i>Journal of Organizational Change Management</i> , 34(3)	https://doi.org/10.1108/JOCM-10-2020-0336
People Are the Real Key to Digital Transformation	<i>Research Technology Management</i> , 62(6)	https://doi.org/10.1080/08956308.2019.1661079
Alligning the organization for its digital future.	<i>MIT Sloan Management Review and Delloitte University Press</i> .	https://www.proquest.com/docview/1832180520/fulltextPDF/A0B0BC5259AB439CPQ/1?accountid=135034
Future software organizations – agile goals and roles	<i>European Journal of Futures Research</i> , 5(1)	https://doi.org/10.1007/s40309-017-0123-7
Future smart energy software houses.	<i>European Journal of Futures Research</i> , 7(1)	https://doi.org/10.1186/s40309-018-0153-9
It's not just about technology: The people side of organization	<i>Shaping the Digital Enterprise - Springer</i>	https://link.springer.com/book/10.1007/978-3-319-40967-2
Soft Skills for the Workplace	<i>Change: The Magazine of Higher Learning</i> , 45(6)	https://doi.org/10.1080/00091383.2013.841516

Study on Human Resource Reform in the Digital Transformation	<i>Joint International Information Technology, Mechanical and Electronic Engineering, Jimec</i>	https://doi.org/10.2991/jimec-16.2016.84
Towards digital transformation: Lessons learned from traditional organizations	<i>Strategic Change</i> , 27(2)	https://doi.org/10.1002/jsc.2185
A systematic literature review of digital transformation	<i>Proceedings of the International Conference on Industrial Engineering and Operations Management</i>	http://ieomsociety.org/toronto2019/papers/236.pdf
Decision support for team staffing: An automated relational recommendation approach	<i>Decision Support Systems</i> , 45(3)	https://doi.org/10.1016/j.dss.2007.05.005
Digital Transformation Strategies	<i>Business and Information Systems Engineering</i> , 57(5)	https://doi.org/10.1007/s12599-015-0401-5
Digital Transformation Leadership Characteristics: a Literature Analysis	<i>Journal of Decision Systems</i> , 00(00)	https://doi.org/10.1080/12460125.2021.1908934

Defining digital transformation: Results from expert interviews	<i>Government Information Quarterly</i> , 36(4)	https://doi.org/10.1016/j.giq.2019.06.002
Does emotional intelligence depend on gender? A study on undergraduate english majors of three Iranian universities	<i>SAGE Open</i> , 1–8	https://doi.org/10.1177/2158244017725796
Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts	<i>Academy of Management Review</i> , 22(4),	https://doi.org/10.5465/AMR.1997.9711022105
Competence Center for the Digital Transformation in Small and Medium-Sized Enterprises	<i>Procedia Manufacturing</i> , 11(June)	https://doi.org/10.1016/j.promfg.2017.07.281
Digital competences of the workforce – a research topic	<i>Business Process Management Journal</i> , 23(3),	https://doi.org/10.1108/BPMJ-06-2016-0126
Overcoming today's digital talent gap in organizations worldwide	<i>Development and Learning in Organizations</i> , 33(6)	https://doi.org/10.1108/DLO-02-2019-0044

Competences for digital transformation: Insights from the Norwegian energy sector	<i>Proceedings of the Annual Hawaii International Conference on System Sciences, 2020-Janua,</i>	https://doi.org/10.24251/hicss.2020.529
Does a different view create something new? the effect of employee diversity on innovation	<i>Research Policy, 40(3)</i>	https://doi.org/10.1016/j.respol.2010.11.004
Developing global service innovation capabilities :How global manufacturers address the challenges of market heterogeneity	<i>Research Technology Management, 58(5)</i>	https://doi.org/10.5437/08956308X5805360
Beyond strategic information systems: Towards an IS capability	<i>Journal of Strategic Information Systems, 13(2)</i>	https://doi.org/10.1016/j.jsis.2004.02.002
<i>The theory of the growth of the firm</i>	Wiley	
Emotional intelligence or artificial intelligence– an employee perspective	<i>Journal of Hospitality Marketing and Management, 29(4)</i>	https://doi.org/10.1080/19368623.2019.1647124

Digital Transformation : A Literature Review and Guidelines for Future Research.	<i>10th European Conference on Informa- tion Systems Management. Academic Con- ferences and Publishing Lim- ited, 1(March)</i>	https://doi.org/10.1007/978-3-319-77703-0
Quo vadis, dynamic ca- pabilities? A content-ana- lytic review of the current state of knowledge and recommendations for future research	<i>Academy of Management Annals, 12(1),</i>	https://doi.org/10.5465/annals.2016.0014
Corporate Learning in Times of Digital Trans- formation: A Conceptual Framework and Service Portfolio for the Learn- ing Function in Banking Organisations	<i>International Journal of Ad- vanced Corpo- rate Learning (IJAC), 8(1)</i>	https://doi.org/10.3991/ijac.v8i1.4440
How does the digital transformation affect or- ganizations? Key themes of change in work design and leadership	<i>Management Revue, 29(2)</i>	https://doi.org/10.5771/0935-9915-2018-2-114
Employee turnover: A neural network solution	<i>Computers and Operations Re- search, 32(10),</i>	https://doi.org/10.1016/j.cor.2004.06.022

The 2017 State of Digital Transformation. Are Companies Investing in Digital Strategies?	<i>Altimeter, October</i>	https://insights.prophet.com/state-digital-transformation-2017
Digital learning: Developing skills for digital transformation of organizations	<i>Elsevier, Future Generation Computer Systems, 91</i>	https://doi.org/10.1016/j.future.2018.08.048
Mastering the digital transformation process: Business practices and lessons learned	<i>Technology Innovation Management Review, 9(2)</i>	https://timreview.ca/article/1217
Breaking the silicon ceiling: Gender equality and information technology in Pakistan	<i>Gender, Technology and Development, 22(2)</i>	https://doi.org/10.1080/09718524.2018.1496695
Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance	<i>Strategic Management Review, 28 (Wiley)</i>	https://doi.org/10.1002/smj.640
Dynamic capabilities and strategic management	<i>Strategic Management Journal, 18(7)</i>	https://doi.org/10.1093/0199248540.003.0013
Digital Transformation : A multidisciplinary reflection and research agenda	<i>Journal of Business Research, 122,</i>	https://doi.org/10.1016/j.jbusres.2019.09.022
Understanding digital transformation: A review and a research agenda	<i>Journal of Strategic Information Systems, 28(2)</i>	https://doi.org/10.1016/j.jsis.2019.01.003

Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal	<i>Long Range Planning</i> , 52(3)	https://doi.org/10.1016/j.lrp.2018.12.001
Digital transformation: A roadmap for billion-dollar organizations	<i>MIT Center for Digital Business and Capgemini Consulting</i> , 1, 1–68	https://www.capgemini.com/wp-content/uploads/2017/07/Digital_Transformation__A_Road-Map_for_Billion-Dollar_Organizations.pdf
Digital innovations: Embedding in organizations	<i>Electronic Markets</i> , 30(1)	https://doi.org/10.1007/s12525-019-00364-9
Corporate social responsibility and gender diversity: Insights from Asia Pacific	<i>Social Responsibility and Environmental Management</i> , 24(3) (Wiley)	https://doi.org/10.1002/csr.1400

DISCUSSION

This literature survey intends to further elaborate on the scholastic work of digital transformation with a special focus on the competencies needed for and due to this technological shift as discussed in literature. It is notified from the literature that digital transformation is the most recent clichéd term in the technological space and remains void of an acceptable universal definition. It is understood that one of the main reasons of not being able to arrive at a common definition could be the fact that it may vary significantly between organizations, geographies, environments etc. Every organization involved in digital transformation sets its own requirements and objectives. However, digital transformation will essentially deliver in any one or a more areas like improved efficiency and cost rationalization, governance and controls, employee experience and customer experience. The definition by i-Scoop (2009), already mentioned in Table 1 provides a comprehensive and a holistic view of digital transformation affecting every entity with regard to its processes and also its employees.

A digital setup has proven to have increased process efficiency, drastically improved business insight, given better cost saving and multiplied revenue. Since digital transformation relates primarily to technology with a central focus on achieving strategic objectives through its competent human resources, hence, having adequate and competent workforce is essential. The researchers are of unified opinion that

digital technologies are compelling the organizations to bring a change in their static policies, inefficient procedures and lack of customer insights (Müller & Hopf, 2017; Verhoef et al., 2021). However, this technology is just one of the necessities for digital transformation whereas the most prominent and significant one is linked to people possessing different skills and abilities allowing the organizations to revisit their strategies so that the challenges related to digital transformation can be responded in an efficient and effective manner (Fonseca & Picoto, 2020). This is in congruence to the dynamic capabilities approach that advocates to create, extend and excel workforce capabilities by the organizations in order to achieve better and improved performance.

CONCLUSION & FUTURE DIRECTION

Digital transformation is a concept which is constantly evolving undergoing various stages of enrichment. Gender diversity on the other hand, has also made inroads in many organizations and also experiencing its stages of maturity. Both concepts have been discussed parallel to each other, nevertheless with no point where they meet or find common ground. This research is one of the few that draws that connection by referencing such seemingly parallel researches. What digital transformation needs is what gender diversity offers yet surprisingly missing from the literature, directing the researcher of this current paper to draw such conclusions which may offer insightful directions for future research. Even though there has been extensive research on gender diversity itself, there are barely any researches that connect and incorporate the concept and benefits of diversity with digital transformation and its requirements and contributions to an organization. It is ironic how many researches have, indeed, discussed the workforce competencies necessary to run a stable and smooth digital transformation, yet little to none have been able to point out that diversity, specifically gender diversity, fulfils such requirements.

Considering digital transformation is a continuous process and also due to the recent COVID-19 environment, further maturity and innovation may be witnessed in digital transformation. This may lead to emergence of newer competencies required for digital transformation in addition to further maturity of the already discussed competencies. Furthermore, the competency skillset may also vary from organization to organization, region, and social and economic environments. Therefore, it is imperative that future researches may be conducted on these changing competency needs, along with exploration of the area of gender diversity, to tap into a varied skillset of human resource.

REFERENCE

- Agostino, D., Arnaboldi, M., & Lema, M. D. (2020). New development: COVID-19 as an accelerator of digital transformation in public service delivery. *Public Money and Management*, 1–4. <https://doi.org/10.1080/09540962.2020.1764206>
- Akano, I. O. N. (2013). Gender equality in skills development: How to find a balance (pp. 1–7).

- Bajpai, N., & Biberman, J. (2021). Digital Transformation and the 2030 Sustainable Development Agenda. January, 1–26.
- Beechler, S., & Woodward, I. C. (2009). The global “war for talent.” *Journal of International Management*, 15(3), 273–285. <https://doi.org/10.1016/j.intman.2009.01.002>
- Boneva, M. (2018). Challenges related to the digital transformation of business companies. *Innovation Management, Entrepreneurship and Sustainability*, 101–114.
- Butschan, J., Heidenreich, S., Weber, B., & Kraemer, T. (2019). Tackling Hurdles To Digital Transformation - The Role Of Competencies For Successful Industrial Internet Of Things (Iiot) Implementation. *International Journal of Innovation Management*, 23(4). <https://doi.org/10.1142/S1363919619500361>
- Dalessandro, C. (2018). Recruitment Tools for Reaching Millennials: The Digital Difference. *International Journal of Qualitative Methods*, 17(1), 1–7. <https://doi.org/10.1177/1609406918774446>
- Daley, S. (2021). Women in tech statistics show the industry has a long way to go. *Builtin*. <https://builtin.com/women-tech/women-in-tech-workplace-statistics>
- Demirkan, H., Spohrer, J. C., & Welser, J. J. (2016). Digital Innovation and Strategic Transformation. *IT Professional*, 18(6), 14–18. <https://doi.org/10.1109/MITP.2016.115>
- Denrell, J., & Powell, T. C. (2016). Dynamic Capability as a Theory of Competitive Advantage. In *The Oxford Handbook of Dynamic Capabilities* (Issue June 2018). <https://doi.org/10.1093/oxfordhb/9780199678914.013.007>
- DiRomualdo, A., El-Khoury, D., & Girimonte, F. (2018). HR in the digital age: how digital technology will change HR’s organization structure, processes and roles. *Strategic HR Review*, 17(5), 234–242. <https://doi.org/10.1108/shr-08-2018-0074>
- Ebert, C., & Duarte, C. H. C. (2018). DT. *IEEE Software*, 35(4), 16–21. <https://doi.org/10.1109/MS.2018.2801537>
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10–11), 1105–1121. [https://doi.org/10.1002/1097-0266\(200010/11\)21:10/11<1105::AID-SMJ133>3.0.CO;2-E](https://doi.org/10.1002/1097-0266(200010/11)21:10/11<1105::AID-SMJ133>3.0.CO;2-E)
- El-Khoury, D. (2017). DT and the world-class HR difference. *Strategic HR Review*, 16(2), 86–88. <https://doi.org/10.1108/shr-01-2017-0001>
- Felsberger, A., Qaiser, F. H., Choudhary, A., & Reiner, G. (2020). The impact of Industry 4.0 on the reconciliation of dynamic capabilities: evidence from the European manufacturing industries. *Production Planning and Control*, 0(0),

1–24. <https://doi.org/10.1080/09537287.2020.1810765>

- Fitzgerald, M., Kruschwitz, N., Bonnet, D., & Welch, M. (2013). Embracing Digital Technology: A New Strategic Imperative | Capgemini Consulting Worldwide. MIT Sloan Management Review, 55(1), 1–13. <https://www.capgemini-consulting.com/SMR>
- Flores, E., Xu, X., & Lu, Y. (2020). Human Capital 4.0: a workforce competence typology for Industry 4.0. Journal of Manufacturing Technology Management, 31(4), 687–703. <https://doi.org/10.1108/JMTM-08-2019-0309>
- Foerster-Metz, U. S., Marquardt, K., Golowko, N., Kompalla, A., & Hell, C. (2018). Digital Transformation and its Implications on Organizational Behavior. Journal of EU Research in Business, 2018, 1–14. <https://doi.org/10.5171/2018.340873>
- Fonseca, P., & Picoto, W. N. (2020). The competencies needed for digital transformation. Online Journal of Applied Knowledge Management, 8(2), 53–70. [https://doi.org/10.36965/ojakm.2020.8\(2\)53-70](https://doi.org/10.36965/ojakm.2020.8(2)53-70)
- Gfrerer, A. E., Rademacher, L., & Dobler, S. (2021). Digital Needs Diversity: Innovation and Digital Leadership from a Female Managers' Perspective. Innovative in Times of Crisis, June, 335–349. https://link.springer.com/chapter/10.1007/978-3-030-69380-0_19
- Goldman, J. (2017). Nearly half of companies say they don't have the digital skills they need. Harvard Business School Publishing.
- Hanelt, A., Bohnsack, R., Marz, D., & Antunes Marante, C. (2021). A Systematic Review of the Literature on Digital Transformation: Insights and Implications for Strategy and Organizational Change. Journal of Management Studies, 58(5), 1159–1197. <https://doi.org/10.1111/joms.12639>
- Helfat, C. E., & Peteraf, M. A. (2009). Understanding dynamic capabilities: Progress along a developmental path. Strategic Organization, 7(1), 91–102. <https://doi.org/10.1177/1476127008100133>
- Henriette, E., Feki, M., & Boughzala, I. (2016). Digital Transformation challenges. Mediterranean Conference on Information Systems, 33. <http://aisel.aisnet.org/mcis2016http://aisel.aisnet.org/mcis2016/33>
- Herring, C. (2009). Linked references are available on JSTOR for this article : Does Diversity Pay?: Race , Gender , and the Business Case for Diversity. 74(2), 208–224.
- Hess, T., Matt, C., Benlian, A., & Wiesbock, F. (2016). Options for Formulating a Digital Transformation Strategy. MIS Quarterly Executive, 15(2), 123–139.
- Hu, R., Shahzad, F., Abbas, A., & Liu, X. (2022). Decoupling the influence of eco-sustainability motivations in the adoption of the green industrial IoT and the impact of advanced manufacturing technologies. Journal of Cleaner Production,

339, 130708

- Ilvonen, I., Thalmann, S., Manhart, M., & Sillaber, C. (2018). Reconciling digital transformation and knowledge protection: A research agenda. *Knowledge Management Research and Practice*, 16(2), 235–244. <https://doi.org/10.1080/14778238.2018.1445427>
- Ismail, M. H., Khater, M., & Zaki, M. (2017). Digital Business Transformation and Strategy: What Do We Know So Far? *Manufacturer Article*, November 2017, 36. <https://doi.org/10.13140/RG.2.2.36492.62086>
- Järleström, M., Saru, E., & Vanhala, S. (2018). Sustainable Human Resource Management with Salience of Stakeholders: A Top Management Perspective. *Journal of Business Ethics*, 152(3), 703–724. <https://doi.org/10.1007/s10551-016-3310-8>
- Jedynak, M., Czakon, W., Kuźniarska, A., & Mania, K. (2021). Digital transformation of organizations: what do we know and where to go next? *Journal of Organizational Change Management*, 34(3), 629–652. <https://doi.org/10.1108/JOCM-10-2020-0336>
- Kane, G. (2019). The Technology Fallacy: People Are the Real Key to DT. *Research Technology Management*, 62(6), 44–49. <https://doi.org/10.1080/08956308.2019.1661079>
- Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D., & Buckley, N. (2016). *Aligning the organization for its digital future*. In MIT Sloan Management Review and Delloitte University Press.
- Kettunen, P., & Laanti, M. (2017). Future software organizations – agile goals and roles. *European Journal of Futures Research*, 5(1), 1–15. <https://doi.org/10.1007/s40309-017-0123-7>
- Kettunen, P., & Mäkitalo, N. (2019). Future smart energy software houses. *European Journal of Futures Research*, 7(1), 1–25. <https://doi.org/10.1186/s40309-018-0153-9>
- Kohnke, O. (2017). It's not just about technology: The people side of organization. *Shaping the Digital Enterprise*.
- Kyllonen, P. C. (2013). Soft Skills for the Workplace. *Change: The Magazine of Higher Learning*, 45(6), 16–23. <https://doi.org/10.1080/00091383.2013.841516>
- Lei, Z., & Jing, Y. (2016). Study on Human Resource Reform in the Digital Transformation. *Joint International Information Technology, Mechanical and Electronic Engineering, Jimec*, 471–477. <https://doi.org/10.2991/jimec-16.2016.84>
- Loonam, J., Eaves, S., Kumar, V., & Parry, G. (2018). Towards digital transformation:

- Lessons learned from traditional organizations. *Strategic Change*, 27(2), 101–109. <https://doi.org/10.1002/jsc.2185>
- Mahraz, M. I., Benabbou, L., & Berrado, A. (2019). A systematic literature review of digital transformation. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, 917–931.
- Malinowski, J., Weitzel, T., & Keim, T. (2008). Decision support for team staffing: An automated relational recommendation approach. *Decision Support Systems*, 45(3), 429–447. <https://doi.org/10.1016/j.dss.2007.05.005>
- Matlin, M. W. (2012). *The psychology of women* (7th ed.). Wadsworth Cengage Learning.
- Matt, C., Hess, T., & Benlian, A. (2015). DT Strategies. *Business and Information Systems Engineering*, 57(5), 339–343. <https://doi.org/10.1007/s12599-015-0401-5>
- McCarthy, P., Sammon, D., & Alhassan, I. (2021). Digital Transformation Leadership Characteristics: a Literature Analysis: *Journal of Decision Systems*, 00(00), 1–30. <https://doi.org/10.1080/12460125.2021.1908934>
- Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly*, 36(4), 101385. <https://doi.org/10.1016/j.giq.2019.06.002>
- Meshkat, M., & Nejati, R. (2017). Does emotional intelligence depend on gender? A study on undergraduate english majors of three Iranian universities. *SAGE Open*, 1–8.
- Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review*, 22(4), 853–886. <https://doi.org/10.5465/AMR.1997.9711022105>
- Müller, E., & Hopf, H. (2017). Competence Center for the Digital Transformation in Small and Medium-Sized Enterprises. *Procedia Manufacturing*, 11(June), 1495–1500. <https://doi.org/10.1016/j.promfg.2017.07.281>
- Murawski, M., & Bick, M. (2017). Digital competences of the workforce – a research topic? *Business Process Management Journal*, 23(3), 721–734. <https://doi.org/10.1108/BPMJ-06-2016-0126>
- Nair, K. (2019). Overcoming today's digital talent gap in organizations worldwide. *Development and Learning in Organizations*, 33(6), 16–18. <https://doi.org/10.1108/DLO-02-2019-0044>

- Osmundsen, K. S. (2020). Competences for digital transformation: Insights from the Norwegian energy sector. *Proceedings of the Annual Hawaii International Conference on System Sciences*, 2020-Janua, 4326–4335. <https://doi.org/10.24251/hicss.2020.529>
- Østergaard, C. R., Timmermans, B., & Kristinsson, K. (2011). Does a different view create something new? the effect of employee diversity on innovation. *Research Policy*, 40(3), 500–509. <https://doi.org/10.1016/j.respol.2010.11.004>
- Parida, V., Sjödin, D. R., Lenka, S., & Wincent, J. (2015). Developing global service innovation capabilities :How global manufacturers address the challenges of market heterogeneity. *Research Technology Management*, 58(5), 35–44. <https://doi.org/10.5437/08956308X5805360>
- Penrose, E. T. (1959). *The theory of the growth of the firm*. Wiley.
- Peppard, J., & Ward, J. (2004). Beyond strategic information systems: Towards an IS capability. *Journal of Strategic Information Systems*, 13(2), 167–194. <https://doi.org/10.1016/j.jsis.2004.02.002>
- Prentice, C., Dominique Lopes, S., & Wang, X. (2020). Emotional intelligence or artificial intelligence– an employee perspective. *Journal of Hospitality Marketing and Management*, 29(4), 377–403. <https://doi.org/10.1080/19368623.2019.1647124>
- Reis, J., Amorim, M., Melao, N., & Matos, P. (2016). DT : A Literature Review and Guidelines for Future Research. 10th European Conference on Information Systems Management. Academic Conferences and Publishing Limited, 1(March), 20–28. <https://doi.org/10.1007/978-3-319-77703-0>
- Schilke, O., Hu, S., & Helfat, C. E. (2018). Quo vadis, dynamic capabilities? A content-analytic review of the current state of knowledge and recommendations for future research. *Academy of Management Annals*, 12(1), 390–439. <https://doi.org/10.5465/annals.2016.0014>
- Schuchmann, D., & Seufert, S. (2015). Corporate Learning in Times of Digital Transformation: A Conceptual Framework and Service Portfolio for the Learning Function in Banking Organisations. *International Journal of Advanced Corporate Learning (IJAC)*, 8(1), 31. <https://doi.org/10.3991/ijac.v8i1.4440>
- Schwarz Müller, T., Brosi, P., Duman, D., & Welp, I. M. (2018). How does the digital transformation affect organizations? Key themes of change in work design and leadership. *Management Revue*, 29(2), 114–138. <https://doi.org/10.5771/0935-9915-2018-2-114>
- Sexton, R. S., McMurtrey, S., Michalopoulos, J. O., & Smith, A. M. (2005). Employee turnover: A neural network solution. *Computers and Operations Research*, 32(10), 2635–2651. <https://doi.org/10.1016/j.cor.2004.06.022>

- Shahzad, F., Du, J., Khan, I., & Wang, J. (2022). Decoupling Institutional Pressure on Green Supply Chain Management Efforts to Boost Organizational Performance: Moderating Impact of Big Data Analytics Capabilities. *Frontiers in Environmental Science*, 600.
- Singh, P., & Finn, D. (2003). The effects of information technology on recruitment. *Journal of Labour Research*, 24(3), 395–408.
- Solis, B. (2017). The 2017 State of Digital Transformation. Are Companies Investing in Digital Strategies? Altimeter, October, 1–38. <https://insights.prophet.com/state-digital-transformation-2017>
- Sousa, M. J. A. R. (2019). Digital learning: Developing skills for digital transformation of organizations. *Future Generation Computer Systems*, 91, 327–334.
- Spremic, L. I. V. B. V. M. (2019). Mastering the digital transformation process: Business practices and lessons learned. *Technology Innovation Management Review*, 9(2), 36–50.
- Stefano, G. Di, Peteraf, M., & Verona, G. (2014). The organizational drive train: A road to integration of dynamic capabilities research. 28(4), 307–327.
- Tanwir, M., & Khemka, N. (2018). Breaking the silicon ceiling: Gender equality and information technology in Pakistan. *Gender, Technology and Development*, 22(2), 109–129. <https://doi.org/10.1080/09718524.2018.1496695>
- Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Review*, 28, 1313–1350.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. <https://doi.org/10.1093/0199248540.003.0013>
- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi, J., Fabian, N., & Haenlein, M. (2021). DT : A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901. <https://doi.org/10.1016/j.jbusres.2019.09.022>
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, 28(2), 118–144. <https://doi.org/10.1016/j.jsis.2019.01.003>
- Warner, K. S. R., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long Range Planning*, 52(3), 326–349. <https://doi.org/10.1016/j.lrp.2018.12.001>

- Westerman, G., Calmejane, C., Andrew, D. B., & Ferraris, P. (2011). Digital transformation: A roadmap for billion-dollar organizations. MIT Center for Digital Business and Capgemini Consulting, 1, 1–68.
- Wiesböck, F., & Hess, T. (2020). Digital innovations: Embedding in organizations. *Electronic Markets*, 30(1), 75–86. <https://doi.org/10.1007/s12525-019-00364-9>
- Wang, J., & Shahzad, F. (2021). A Visualized and Scientometric Analysis of Health Literacy Research. *Frontiers in Public Health*, 9.
- Wang, J., Shahzad, F., Khan, D. I., & Siyal, A. W. (2022). Decision Making with an Alternative Mindset in Online Shopping Environment: Identifying User Intentions Toward F-Commerce. *Frontiers in Psychology*, 801.
- Yasser, Q. R. A. A. M. I. A. (2017). Corporate social responsibility and gender diversity: Insights from Asia Pacific. *Social Responsibility and Environmental Management*, 24(3), 210–221.