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STRATEGIC AGILITY, HRM PRACTICES AND DIGITAL TRANSFORMATION AT WORKPLACE

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Abstract

Digital Transformation (DX) has necessitated organizations demand a novel set of skills from the workforce in order to survive, adapt and compete in the rapidly volatile and unpredictable environment. Consequently, numerous studies have explored the adoption of digital technologies and strategies to cope with the evolving challenges. However, most research on this theme tends to focus separately on agility, human resources (HR) practices, and digital transformation. This current study seeks to unravel the interrelationships among strategic agility, agile attributes, HR practices, and workforce agility within the DX ecosystem. As a contribution, this paper not only sheds light on the critical factors facilitating digital transformation within organizations but also delves into the literature to identify the agile attributes essential for the workforce. The study provides insights to the managers to develop attributes such as highly skilled, knowledgeable, proactive, flexible, resilient, adaptable, eager for learning and development, openness to new technology, capacity to develop innovative ideas, being comfortable with change etc. within the workforce. This can be achieved by implementing human resources practices such as training and knowledge development, job enrichment, job enlargement, creating self-managed teams, encouraging multi-tasking and collaboration among employees that are found to be crucial in creating an agile workforce. Such a strategic approach is pivotal for nurturing an agile workforce, that is fundamental to the digital transformation process. Future studies may leverage insights from the current study to embrace and develop more influential and impactful strategies in organisations for the adoption of digital technology by their employees.

Keywords: Agility, Autonomy, Digital Transformation, Empowerment, Information System (IS), Workforce Agility.

Introduction

Digital Transformation (DX), which is also expressed as Industry 4.0 ecosystem, presents a formidable challenge to an organization's change management capabilities (Mrugalska & Ahmed, 2021). Contrary to a mere technological shift, DX embodies a transformative shift in the relationship between technology, individuals, and the broader social and business landscape (Broekhuizen, 2021). The integration of digital technologies into business operations, often termed "digital transformation" or "digitalization," brings about substantial changes in the organizational work system, operations, and culture (Matthiae & Richter, 2018).

Organizations grappling with DX must strategically plan a central DX strategy to align, coordinate, focus, and integrate diverse threads across the company (Matt et al., 2015). The pivotal task lies in seamlessly integrating digital and business strategies into a comprehensive 'digital business strategy' for a successful digital transformation (Bharadwaj et al., 2013). As digital platforms intertwine humans, technologies, business, and society, it is imperative for organizations to formulate

strategies fundamental to their evolving growth paths. The transition to this new reality should not be undervalued. Recognizing the inherent risks and challenges in transformation processes (Vial, 2019), and for positive results, organizations need to consider various facilitating factors for successful execution.

In this dynamic landscape, organizations are increasingly turning to agility as a potential solution for successful digital transformation. Studies by Sherehiy & Karwowski (2014) and Li et al. (2018) underscore organizational agility as a pivotal business capability contributing to success in volatile environments. Flexibility and agility emerge as key strategies for organizations to navigate the changes introduced by technology adoption (Matthiae & Richter, 2018). Employees, considered the intellectual capital and the "hidden value of organizations" (Popescu, 2019), are recognized as tactical strategic resources crucial for achieving agility (Alavi & Wahab, 2013). An agile workforce is deemed essential for managing unpredictable changes in a turbulent business environment and proactively providing viable solutions (Muduli, 2016).

Managers play a crucial role in fostering agility by prioritizing human resources policies and their implementation during transformation processes (Vardarlier, 2016). Recognizing that sophisticated technology alone cannot achieve this, involving the entire workforce in the transformation is essential (Sherehiy et al., 2007). Therefore, creating a conducive environment and instilling a culture of agility among human resources become imperative for organizational success (Qin & Nembhard, 2015).

2. Objectives of the study

Many researchers have meticulously examined literature related to agility, HRM practices, and Industry 4.0 in silos. However, a noticeable gap exists in the exploration of their interconnectedness within the context of Digital Transformation (DX). The absence of a study delving into the relationships among these elements in the realm of DX is evident. A significant void persists in the published literature, necessitating the development of a more comprehensive understanding of the entire Industry 4.0 ecosystem. Keeping this research gap in mind, the study aims to explore the characteristics and attributes of workforce agility. Additionally, it investigates the management practices that play an important role in influencing the agile behaviour of employees, consequently fostering effective digital transformation.

Thus, in other words, the research aims to unravel answers to the following specific research questions:

RQ1.What constitutes the essence of digital transformation (DX)?

RQ2. How can an agile strategy be defined and conceptualized?

RQ3. What specific characteristics and attributes within the workforce contribute to its agility?

RQ4. To what extent do management practices play a role in influencing the agile behaviour of employees, thereby fostering effective digital transformation?

The subsequent sections delve into conceptualizing the relationship between digital transformation and strategic agility. By reviewing existing literature, the attributes that render a workforce agile are identified. Following this, the next section discusses the role of human resource practices in developing the agile capabilities of a workforce. A comprehensive discussion ensues on the

managerial implications derived from the findings, offering valuable insights for organizational leaders. The concluding sections not only provide reflections on potential avenues for future research but also present the primary conclusions drawn from this study, consolidating key takeaways for the reader.

3. Digital Transformation (DX) and Strategic Agility

The contemporary workplace is undergoing a profound redefinition due to the pervasive influence of digital innovations (Marsh et al., 2021). These innovations, as noted by Dabrowska et al. (2022), involve the replacement or modification of non-digital procedures, leading to comprehensive organizational changes (Radziwon et al., 2022). The dynamic nature of DX necessitates employees to exhibit proactive engagement, effective work organization, efficient communication, and successful performance of tasks involving emotion, intuition, creativity, trust, and ethics (Ebert, 2015).

At higher organizational echelons, managers are compelled to undergo a paradigm shift. The conventional command and control approach must give way to a mistake-tolerant, risk-taking leadership-oriented methodology. Corporate leaders are expected to direct, support, inspire, and motivate their teams while actively participating in the learning process alongside them. Decision-making informed by data, swift execution, and heightened situational awareness are imperative for these managers. Consequently, DX mandates a significant departure from prevailing organizational procedures, human resources practices, and work culture. Organizations must proactively strive to explore new opportunities while concurrently garnering organizational support for such endeavors (Garud & Karunakaran, 2018).

As digital transformation (DX) necessitates the synergy of technology and human elements, organizational changes must be instigated across various levels. This includes modifications to both organizational and manufacturing systems (Matt & Rauch, 2020), the interchange of resources and capabilities (Yeow et al., 2018), the reconfiguration of processes and structures (Resca et al., 2013), adaptation to shifts in customer behaviors and expectations (Coad et al., 2021), adjusting to leadership changes (Singh & Hess, 2017), and implementation of a cohesive digital culture (Llopis et al., 2004).

Extant literature has proved beyond doubt the imperative need of having an agile workforce (Breu et al., 2002; Shetty et al., 2023) to face the intensive challenges with regard to people, structures, processes, and adoption of digital technology. The literature (Jackson & Johansson, 2003) has identified five sub-strategies necessary to achieve organizational agility: 1) manufacturing agility; 2) product and services related agility; 3) workforce collaboration and knowledge related agility; 4) leadership and culture change agility.

Strategic agility uniquely not only recognizes change, but analyses its impact on competitiveness and brings out a strategy for becoming capable of managing change (Muduli, 2013). Agility as a strategy incorporates several ideas, techniques, work methods, and procedures created within the framework of adaptive and flexible organisation, depending on the demands of a particular circumstance in a business environment. Business leaders are increasingly integrating agility into their comprehensive enterprise-wide plans, responding to the dynamic and competitive nature of the environment to gain a distinctive competitive edge (Muduli, 2017). The significance of agility as a

strategy for organizations is vividly illustrated in Figure 1, emphasizing its exponential importance in today's business landscape.

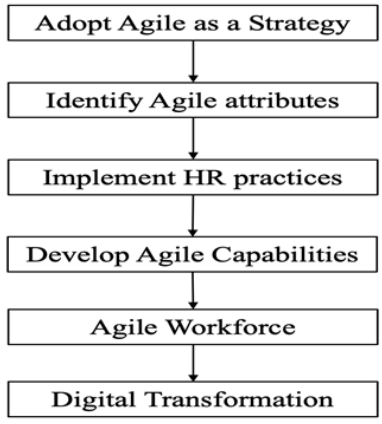

Figure 1: Strategic Agility and DX

4. Attributes of an Agile Workforce

Employees with agility potential have the following primary traits: positive attitude towards learning and self-improvement, aptitude for addressing problems, openness to new technology, and capacity to develop innovative ideas, being comfortable with change (Alavi & Wahab, 2013). Gunasekaran (1999) has identified negotiation skills, knowledge in team working as important attributes required for an agile workforce. Attributes of an agile workforce are presented in Table. 2

Table 1: Attributes of an Agile Workforce

Author	Attributes/Characteristics
Alavi & Wahab (2013)	Positive attitude towards addressing problems, eager for learning and development , openness to new technology, capacity to develop innovative ideas, being comfortable with change
Gunasekaran (1999)	Negotiation skills, knowledge in team working
Griffin & Hesketh (2003); Dyer & Shafer (2003); Sherehiy et al.(2007); Lee & Trimi (2021)	Proactivity, adaptivity, resilience and flexibility.
Hopp & Oyen (2004)	Higher levels of client service, accelerated learning curves, and economies of scope and depth

An analysis of the studies made by Griffin & Hesketh (2003), Dyer & Shafer (2003), Sherehiy et al. (2007) discerns the attributes of an agile workforce mainly into three groups: proactivity, adaptivity, and resilience. Proactivity refers to a person's initiative to search and engage in opportunities that have an advantage over a new environment. The term "adaptive attribute" refers to taking on different roles, altering one's personality or one's attitude on various levels to perfectly fit a newer changed situation. Resilience is the capacity to operate effectively under constant pressure when the ongoing

applied strategies don't work in the new circumstances. According to studies, workers may be given training to help them acquire dynamic skills like agility, flexibility, and resilience required in delivering the products and services that customers need (Lee & Trimi 2021).

Agile characteristics inevitably produce tangible benefits such as improved quality, higher levels of client service, accelerated learning curves, and economies of scope and depth (Hopp & Oyen, 2004). Basically, agile employees are multi-functional workforce, self-directed teams who can be empowered. Thus, strategies focusing on inducing workforce agility (WFA) must have a proper understanding of the various attributes of employees that lead to their agile behavior. This would also further aid the managers in proper selection and implementation of work practices that facilitate workforce agility and in turn, accelerate DX within the organization.

5. Agile attributes and human resource practices

Leveraging employees' knowledge and skills have resulted in achieving agility. The current literature on agility highlights the necessity for highly competent, flexible, and dynamic employees that are energized and adaptive to sudden change (Kidd, 1994). An agile behavior can influence the adoption behaviour of the customers (Kamble et al., 2019). Organisational practices play a vital role in developing agile attributes among the workforce which is crucial to making an organization agile (Sherehiy & Karwowski, 2014). Organizational practices have the capability to strengthen the agile attributes and encourage agile behaviour among the workforce (Sumukadas & Sawhney, 2004; Munteanu et al. 2020). Most of the studies on workforce agility have focused mainly on identifying behaviorual attributes of the workforce. And, the literature on the effects of adopting human resources practices fostering workforce agility is restricted to unproven recommendations (Sherehiy & Karwowski, 2014).

Shafer et al. (2001) on the basis of a case analysis, highlighted the impact of crucial HR practices and programmes on workforce agility, including selection, induction, performance management, promotion, organisational learning and training, recognition and rewards. According to Beltran-Martin and Roca-Puig (2013), implementing HR practices, such as performance appraisal for training and development, just and fair compensation and job enrichment have a positive impact on employee flexibility. According to Bersin and Associates's (2014) analysis of the organisational practices, “Balancing future and current needs while planning HR staffing, investing in improving the performance of the HR group, continuously evaluating to improve HR's customer service, and embedding few or no layers of authority within the HR group” are few of the crucial human resources practices that promotes workforce agility. A study by Alavi et al. (2014) found two characteristic features of organisation, namely, organisational structure (decentralisation of decision-making, low formalisation, and a flat structure) and organisational learning which can foster workforce agility.

It must be noted that an employee's agility emanates from the “level of knowledge, the orientation towards learning and development activities that support the organization” (Al-Kasasbeh et al., 2016). Thus, developing the agile ability necessitates harnessing the knowledge and skills of employees, their creativity, openness to collaborate and their competency. There are five ways by which organizations can prepare the employees to adopt dynamic technological changes and make them agile. They are: (a) Retaining the knowledge force by catering to the individual requirements and providing better development opportunities; (b) Empowering the employees by providing them

opportunities to develop skills and inner potential; (c) Giving job autonomy to employees while promoting cordial relationships and respect across cultures; (d) Encouraging collaboration and cooperation between different functional entities of the organizations; (e) Experimenting with innovative ideas and practices that promote flexibility and agility while remaining open to alternate solutions. Therefore, a significant challenge to DX is developing the knowledge and skill set required for the smooth transition.

Keeping the agile attributes in mind, organizations may implement a variety of human resources practices for creating or cultivating workforce agility such as "staffing, training, coordination, collaboration, incentives and empowerment" (Qin & Nembhard, 2015). Many other studies have referred to "organizational learning and training, compensation, involvement, teamwork and IS" (Muduli, 2016) as key to building an agile workforce.

6. Findings

The research findings proposes the implementation of the following human resources practices to cultivate agile capabilities within the workforce, derived from a thorough review of the existing literature. Table 2 shows the agile capabilities which can be developed within the workforce by implementing various HR practices.

a) Training and Knowledge Development (T&D)

T & D can be seen as having a great influence in improving new professional skills and knowledge capabilities of the employees**.** Training initiatives to improve agility must be dynamic and experience-based (Gehler, 2005). An effective learning environment encourages knowledge transfer among employees. It makes them proactive and creative in problem solving thereby enhancing the capability to adapt and respond to changes in work and business settings (Gunasekaran, 2001). Cross-training is an influential program for the workers (Hopp & Oyen, 2004) that can ensure workforce agility. Iravani & Krishnamurthy (2007) re-emphasized the importance of training in employee agility in his research on agility in repair and maintenance contexts. Businesses that wish to become agile should encourage and train their workers to use technology as well as concentrate on it (Gunasekaran, 1999). On the whole, learning new skills and competencies makes employees professionally flexible.

b) Employee Involvement Practices

Higher-order employee involvement practices showed greater support to promote flexibility (Kathuria & Partovi, 1999) and played a key role in creating a truly agile workforce. Sumukadas & Sawhney (2004) found that when higher order employee involvement practices like encouraging self-managed teams, job enrichment, job enlargement, and are built on the foundations of lower-order employee involvement practices like quality of work life, quality circles, survey feedback, and suggestion systems, they become more effective in enhancing the agile capabilities of the workforce. Power-sharing practices such as improving training efficiency, switching between roles, multi-tasking and collaboration offer considerable support in enabling the workforce agility architecture (Hopp & Oyen, 2004). Based on their study results, Sherehiy & Karwowski (2014) suggests that developing collaborative relationships among the employees, encouraging cooperation with customers and other stakeholders not only promotes workforce agility but also negates the

uncertainty of work in agile enterprises. Therefore, it is suggested that the organizations may encourage the involvement of employees to promote agility behaviour among them.

c) Employee Autonomy and Empowerment

Literature on agility proclaims that workforce agility necessitates autonomy in taking decisions and employee empowerment (Sherehiy & Karwowski, 2014). Job autonomy is believed to be

Table 2: Human Resource Practices and Agile Capabilities

Author	HR Practices	Agile capability
Gunasekaran, 1999; Gunasekaran (2001); Hopp & Oyen (2004); Gehler (2005); Iravani & Krishnamurthy (2007)	Training and Knowledge Development	Helps in developing new professional skills, knowledge capabilities and competencies, encourages knowledge transfer among employees, learning to use technology, making workers proactive and creative in problem solving by improving efficiency of training.
Kathuria & Partovi, (1999); Sumukadas & Sawhney (2004); Hopp & Oyen (2004); Sherehiy & Karwowski (2014)	Employee Involvement Practices	HR practices such as Job enrichment, job enlargement, switching between roles, multi-tasking and self-managed teams helps in developing collaborative relationships among the employees, and encouraging cooperation with customers.
Brousseu (1983); Damanpour (1991); Frese & Fay (2001); Muduli (2008, 2017); Sherehiy & Karwowski (2014)	Employee Autonomy and Empowerment	Enhances decision-making, cognitive complexity, innovation, employee creativity and personal initiative, team accountability, intrinsic motivation and self-efficacy.
Ginnodo (1997); Breu et al (2002); Kuipers et al. (2015)	Information-sharing (IS)	Open communication including computer-aided technologies, mobile technology applications increase flexibility, group decision support systems, and ready to collaborate.
Sumukadas & Sawhney (2004); Muduli & Pandya (2018)	Compensation and Reward System	Skill-based pay systems, (task variability), Team - based productivity incentives (motivates employees); encourages power sharing.

crucial for encouraging experimentation and innovation (Damanpour, 1991), proactivity and creativity in employees (Frese & Fay, 2001). Autonomy in jobs allows individuals to be more flexible in formulating more elaborated plans to become adaptable to the sudden changes in job demands thereby enhancing employees' cognitive complexity (Brousseu, 1983). Equitable reward systems and practices encourage team accountability and autonomy across boundaries (Muduli, 2008). Workforce agility can be facilitated through psychological empowerment in the form of intrinsic motivation and self-efficacy (Muduli, 2017). Thus, studies on agility reiterate that the all important behaviour of flexibility, adaptability, resilience and persistence can be ensured through job autonomy and employee empowerment.

d) Information-sharing (IS)

Open communication is fundamental to promoting operational speed and flexibility. Information-sharing "involves articulating a vision, values, strategies and goals; aligning policies, practices and

business plans; improving processes; organizing, communicating and removing barriers that prevent outstanding performance" (Ginnodo, 1997). Studies from the perspective of information technology (IT) on determinants of workforce agility (Breu et al., 2002) revealed that various computer-aided communication technologies including mobile technology applications and group decision support systems increase workforce agility when used for collaborative working. Information systems improve a firm's performance by enabling them to increase flexibility and adopt quick decision-making strategies (Kuipers et al., 2015). Timely sharing of information related to customers, products make organizational leaders, managers and employees feel informed, ready to be flexible and ready to collaborate.

e) Compensation and Reward System

A higher-order employee involvement system requires a different reward system. Sumukadas & Sawhney (2004) showed that rewards (skill-based pay systems, team-based productivity incentives, etc.) which are non-traditional are more effective in fostering employee agility in contrast to conventional compensation approaches like profit-sharing, gain-sharing, and ESOPs. The skill-based pay system by putting emphasis on task variability, acquiring depth of skills in more numbers is consistent with the goal of creating an agile workforce. Introducing Team-based production incentives for motivating employees to work as a team, fostering acquisition and application of different skills promotes agility among the workforce. Non-monetary rewards also support power sharing and are equally effective in creating an agile workforce (Muduli & Pandya, 2018).

7. Discussion and Conclusion

This study reviewed the workforce agility literature. Despite its importance, very few studies have been conducted in developing programs to create agile people. This paper contributes significantly by conducting a thorough examination and revision of existing literature on agility as a strategic concept. It not only illuminates the critical factors that facilitate the adoption of digital transformation within organizations but also delves into the literature to identify the agile attributes of the workforce. The study identified a few attributes such as highly skilled, knowledgeable, proactive, flexible, and adaptable etc. invariably possessed by an agile workforce. These agile attributes which are so critical to creating an agile organization can be developed among the workforce by implementing various human resources practices.

This study recommends organizations to focus specifically on implementing human resources (HR) practices such as training and knowledge development, job enrichment, job enlargement, creating self-managed teams, encouraging multi-tasking and collaboration among employees to foster and cultivate workforce agility. Empowering employees by giving them autonomy in their jobs, introducing a fair and equitable reward system, encouraging them to adopt computer-aided technology, and properly articulating the values and strategies of the company can also make the employees agile and ready to collaborate. Such a proactive approach can be strategically designed, programs to create agile people need to be continously performed to navigate the complexities of digital technology transformations effectively.

8. Implications of the study

The literature review findings strongly indicate that managers should refrain from undertaking and

emphasizing digital transformation initiatives without simultaneously investing in the agility training of their workforce. Crucially, organizations must adopt agility as a core strategy and persist in developing human resources programs that not only retain current agile personnel but also cultivate new agile talent. Consequently, managers must initially identify the attributes of an agile workforce and implement HR practices in a manner that actively promotes workforce agility. This approach ensures a swift adaptation to digital technologies and facilitates the successful implementation of Digital Transformation (DX) within the organization.

9. Limitations and scope for future research

The study is not without certain limitations. The agile attributes and managerial practices presented herein should be viewed as a conceptual and theoretical foundation for future research, rather than definitive conclusions. There is room for expansion to explore additional areas, such as optimizing structures and processes for rapid technology adaptation, establishing a knowledge management system, promoting transformational leadership behavior, and incentivizing technology-based workplace behavior. Future studies have the potential to broaden our conceptual framework by incorporating these aspects and augment this knowledge. Organizations can leverage insights from the current study to embrace and develop more influential and impactful strategies for the adoption of digital technology by their employees.

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