Digital platform capability and organizational agility of emerging market manufacturing SMEs: Mediating role of intellectual capital and the moderating role of environmental dynamism

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Abstract
In this study, we untangle the relationship between digital platform capability and organizational agility in the manufacturing sector small and medium-sized enterprises (SMEs by investigating the mediating role of intellectual capital and the moderating role of environmental dynamism. Using a time-lagged two-wave survey of 227 manufacturing SMEs, we tested our proposed hypotheses using structural equational modeling (SEM). Our results reveal that digital platform capability is positively associated with the agility of SMEs and that all three intellectual capital dimensions (i.e., human, organizational, and relational capital) mediate this relationship. We also found that environmental dynamism has a negative moderating role on digital platform capability and intellectual capital. Environmental dynamism curbs SMEs’ abilities to turn their digital platform capabilities into increased intellectual capital. Our results shed light on the importance of intellectual capital in creating improved organizational agility for manufacturing SMEs through digital platform capability within the boundary conditions of environmental dynamism.

Keywords: Digital platform capability (DPC); organizational agility (OA); intellectual capital (IC); environmental dynamism (ED); manufacturing SMEs.
1. Introduction

Organizations have used the flexibility and efficiency provided by technology to better cope with the continuously evolving world. This includes such technology as big data analytics, the Internet of Things (IoT), digital platforms, social media technologies, and cloud computing that enable better connectivity, effective communication, and higher automation (Li et al., 2020). Organizations can attain a sustainable competitive advantage through the efficient utilization and management of these digital technologies (Sakas et al., 2014). Digital platform capability (DPC), defined as an organization’s ability to use the latest advanced digital tools and technologies as competitive instruments (Cenamor et al., 2019), can have a substantial impact on a firm’s competitive advantage (Mikalef and Pateli, 2017; Rai and Tang, 2010), innovation (Sedera et al., 2016), and performance (Cenamor et al., 2019).

According to Chen and Siau (2020), organizational agility (OA), defined as the ability to identify and react efficiently to market opportunities at the firm level (Sambamurthy et al., 2003), also provides a promising lens for the study of the implications of external dynamism on organizational performance. Environmental volatility and higher uncertainty in global markets coupled with exponential technological advancements have led businesses to calibrate their capacity so that they can rapidly and flexibly respond (Shams et al., 2021; Tallon and Pinsonneault, 2011). Many firms turn to information technology (IT) capabilities to better cope with the turbulence and market fluctuations (Martinez-Caro et al., 2020) and to develop their OA. As such, OA has been characterized as a strategic corporate imperative for a business to survive and succeed (Huang et al., 2014), and more recent research has established that organizations can improve their performance through agility that is driven by digital capabilities (Felipe et al., 2020).
Even though SMEs are predominantly affected by technological advancements and can leverage their DPC to foster their OA, they are also embedded in the context in which such advancements take place. Sadeghi et al. (2019) argued that the environment has a significant impact on SMEs and that changes in technological infrastructure and the specific cultures in emerging markets may impact how SMEs are affected by changes in their environment. Thus, their behavior is conditioned by environmental dynamism (ED), defined as the level of unpredictability and instability in the firm’s environment (Chan et al., 2016). The unstable and dynamic environment in many emerging markets signifies the need for firms to deal with several diverse stakeholders and undertake compound and contrasting processes (Jafari-Sadeghi et al., 2021c). Thus, researchers have called for more studies on intellectual capital and agility in the context of emerging markets (Ferraris et al., 2021). Previous researchers have also argued that dynamism signifies the irregularity and instability of the changes in the organizational environment that lead to ambiguity in decision-making processes (Aldrich, 1979; Dubey et al., 2019). Accordingly, it is essential to understand how organizations leverage DPC in the effective implementation of digital platforms in order to pursue OA while accounting for ED. Researchers have stressed the importance of further exploration of the relationship between technical IT capabilities and OA (Gao et al., 2020). However, studies have not yet accounted for the potential moderating role of ED.

Scholars like Mubarik et al. (2018) have contended that the industry 4.0 (I4.0) revolution has amplified the role of intangible resources critical to the attainment of a competitive advantage (Mahmood and Mubarik, 2020). Intellectual capital (IC) is defined as an integrated set of intangible resources, including relational, organizational, and human capital, which are necessary for firms to gain a competitive advantage (Liu and Jiang, 2020). Researchers have argued that IC
plays a crucial role in leveraging strategic capabilities like DPC and in attaining a firm’s competitive advantage (Mubarik et al., 2019). DPC can enhance OA through IC and its dimensions of human capital, relational capital, and organizational capital (Chu et al., 2006; Mubarik et al., 2019). Therefore, we expect intellectual capital to connect DPC and OA and explain how firms can translate their DPC into OA. Nonetheless, extant research has not yet examined the mechanisms which convey the influence of DPC on OA.

In view of these arguments and the identified gaps, the purpose of this research is to explore the link between DPC and OA in manufacturing SMEs and, in so doing, use the dynamic capabilities theory to account for the moderating role of ED and the mediating role of IC. We ask the research question of “When and how does the DPC of manufacturing SMEs contribute to their OA?” We believe this research question to be of interest because it helps untangle the relationship between DPC and OA by addressing the questions of when (i.e., the moderating role of ED) and how (i.e., the mediating role of IC) DPC can help manufacturing SMEs enhance their OA. We used time-lagged data collected in two phases from firms belonging to an industrial zone in Pakistan to test our hypotheses. The sample consisted of 227 SMEs and data were analyzed through SEM and Preacher and Hayes’ process method.

This paper contributes to research on DPC, IC, and OA in several ways. First, we assess the link between DPC and OA and explain how DPC is linked to the OA of manufacturing SMEs in emerging markets. Emerging market SMEs are significantly under-researched in the specific context of DPC (Jafari-Sadeghi et al., 2021b). In addition, scholars have highlighted the need to increase our understanding of the role of digital capabilities in relation to OA, especially in volatile, uncertain, complex, and ambiguous contexts as is often the case in emerging markets (e.g., Troise et al., 2022). Hence, our paper fills these specific gaps in the extant literature. Second, through the
theoretical lens of DC, we focus on the role of IC in relation to DPC in enhancing OA since researchers have hinted that the underlying mechanisms of this relationship should be explored (Gao et al., 2020). Untangling the link between DPC and OA highlights the important role of IC in utilizing DPC and achieving greater levels of OA amid the external uncertainty and dynamism which SMEs face in emerging markets. Third, we assess IC through the three subdimensions of human capital, organizational capital, and relational capital and their distinct roles in enhancing OA. Finally, we examine the role of ED in moderating between DPC and IC in manufacturing SMEs during the second wave of the COVID-19 pandemic in Pakistan. The COVID-19 pandemic has significantly affected all businesses and especially SMEs (Caballero-Morales, 2021). Thus, it is pertinent to study the impact of such a dynamic and unstable environment on the factors which affect the agility of organizations (Al-Omoush et al., 2020). Building on these contributions, this study provides recommendations to practitioners in SME manufacturing on how OA can be enhanced through DPC and IC.

The rest of the paper is organized as follows. First, we define the variables and explain them in light of the previous literature, followed by hypotheses development and model presentation. Next, we discuss the methodology adopted in the paper, including the sample’s context, sampling procedure, and the measures used in the study. In the last section, we discuss the results, practical and theoretical implications, limitations, and possible avenues for future research.

2. Theoretical background and hypotheses development

2.1. Dynamic capabilities theory

Dynamic capabilities (DC) theory has been used extensively in the literature to understand the importance of a firm’s strategic capabilities and their effects on competitive performance (Teece,
DC theory emphasizes the maintenance and development of superior operational capabilities which are necessary to perform and synchronize operational processes (Schilke et al., 2018). It rests on the position that dynamic capabilities can alter the current positions and resources of firms as well as their operational capabilities, thereby leading to new positions and paths to make the best use of their strategic assets (Schilke et al., 2018). Previous researchers have also used DC theory to fully understand IT-related capabilities and firm-level outcomes (Al-Omoush et al., 2020; Dubey et al., 2019; Mandal, 2019; Xiao et al., 2020). However, this theory has mainly been explored in developed nations where emerging markets that are unique in the economic and sociocultural environment have their own resources and capabilities (Jafari-Sadeghi et al., 2021a, b). We use this theoretical approach to propose and test our theoretical model in emerging markets.

2.2. Digital platform capability

Sedera et al. (2016) referred to digital platforms as a way to develop the information technology infrastructure, and they include social media, mobile computing, and e-commerce platforms that have gradually expanded the boundaries of firms and enabled them to digitally create conglomerates with their partners. Digital platforms are strategic tools and dematerialization processes, and they can bring noteworthy cost reductions and increase revenues (Esposito De Falco et al., 2017). They disrupt conventional businesses, transform the structures of key industries, and force traditional firms to reassess their business models. Digital platforms support business operations by providing different technical elements, such as software and hardware devices, that help organizations coordinate within and outside their organizations for a smooth business flow (Cenamor et al., 2019). They also allow ease of connectivity, bring different outside knowledge resources, and provide an opportunity to maintain collaboration among partners in supply chains.
Nonetheless, adopting and using digital platforms is not an easy ride. After the implementation of digital platforms, organizations may face the adoption of different technology or change-related challenges within their boundaries or with their partners, including uncertainty in relationships, exchange of risks, and hazards that impact organizational outcomes. These challenges bring the concept of DPC into the picture to effectively utilize digital platforms and overcome challenges associated with the adoption of digital platforms (Wang et al., 2016). According to Cenamor et al. (2019), DPC refers to the organization’s ability to use the latest advanced digital tools and technologies as competitive instruments. DPC is essential for the deployment of ICT-based resources and technologies together with other resources inside and outside the firm (Mikalef and Pateli, 2017). DPC enables organizations to integrate strategic knowledge sources through digital technology to better respond to dynamic environments (Cenamor et al., 2019).

2.3. Intellectual capital

Apart from providing valuable product development and services, intellectual assets also help organizations to maintain the competitive advantage which results from competitive dynamic environments and changing customer needs (Battisti et al., 2015). After the I4.0 revolution, the relationship between machines and humans was developed alongside changes in organizational structures and characteristics. This highlights the importance of IC in the era of I4.0, and researchers argue that stepping into the I4.0 revolution requires strong IC (Mahmood and Mubarik, 2020).

McDowell et al. (2018) defined IC as “the economic value of an organization’s intangible assets, such as rational capital, organizational capital and human capital” (p. 2). In the context of a knowledge economy, IC helps a firm succeed and enables the economy to grow (Popkova et al.,
According to Mahmood and Mubarik (2020), IC comprises the relationships and knowledge of organizations as converted into firm performance. With the development of the knowledge economy and the advancement of new technologies, IC is gradually replacing traditional factors, including land and labor, and becoming a critical part of the manufacturing sector (Bontis et al., 2015).

IC enhances competitive advantage and the manufacturing industry’s value. As such, it underpins an organization’s innovation, predictive ability, foresight, and ensuing development (Bhatti et al., 2020). Seminal studies in innovation and management research, including the works of McDowell et al. (2018), Hsu and Fang (2009), Saxena (2015), and Liu and Jiang (2020), have discussed IC based on the three dimensions of human capital, organizational capital, and relational capital. We adopt their conceptualization and discuss each dimension in turn.

2.3.1. Human capital

An organization’s human capital is referred to as the collective capabilities of an organization’s employees to solve problems and to better connect with customers and suppliers (Mubarik et al., 2018). Human capital comprises the skills, overall knowledge, experiences, and proficiency of an organization’s employees (Edvinsson, 1997). Individual qualities, such as problem-solving, creative thinking, and attitude are also considered to be a part of human capital by many researchers, for example, Russo and Fouts (1997) and Mouritsen (1998). Researchers have argued that individual abilities, skills, and knowledge will help improve an organization’s performance (Baima et al., 2021; Mahmood and Mubarik, 2020). The improvement of human capital via education and training leads to an improvement in organizational performance. Accordingly, human capital is an essential dimension of IC.
2.3.2. Relational capital

Relational capital is defined as “the extent to which people in a particular work unit form high-quality relationships resulting in the exchange of knowledge and learning from each other” (Carmeli and Azeroual, 2009, p.88). Organizations are connected with external stakeholders, such as suppliers and customers, through these relationships, and relational capital plays a vital role in forming relationships among organizations and their stakeholders. It also influences relationships among internal employees of organizations (Mahmood and Mubarik, 2020; Rezaei et al., 2020). Relational capital includes strong understanding and collaboration among partners, higher trust levels, and especially stronger relationships among an organization’s strategic partners.

2.3.3. Organizational capital

Organizational capital consists of all the resources of knowledge that are non-human (Mahmood and Mubarik, 2020). Organizational capital is the firm’s capacity to organize and develop rare resources in order to rapidly adapt to changes in the business environment. It also entails the integration of business processes to transform current resources into organizational processes and successfully implement business strategies (Liu and Jiang, 2020).

According to Stewart (1997), organizational capital serves two purposes. The first purpose is to organize knowledge transfer to preserve the firm’s existing knowledge and avoid leaks. The second purpose is to connect different stakeholders to experts, including sources of knowledge, expertise, and data in a timely manner. As knowledge sharing is based on different types of transmissions, a well-organized firm structure must be in place. This helps organizations and people to connect with different actors and information sources via efficient structural frameworks and effective network channels (Harris, 2000). Thus, organizational capital is a key asset for the firm and a dimension of IC (Hsu and Fang, 2009; Saxena, 2015).
2.4. Organizational agility

OA is the firm’s capacity to rapidly react to changes in its market (Lee, 2004). Different researchers have conceptualized agility in various ways, including agility as a process (Sambamurthy et al., 2003) and as a combination of IT, system, and strategic agility (Lowry and Wilson, 2016). Still others have described agility as an organizational level capability, while Lu and Ramamurthy (2011) saw agility as a composite of “market capitalizing agility” (ability to innovate products or services as per customer demands) and “operational adjustment agility” (capability to change internal operations to cater to demand changes).

Complexity and uncertainty in the market climate enable businesses to react promptly and to be agile. Enterprises that concentrate on responsiveness to consumer demands in a constantly evolving dynamic world prioritize the development and application of agility in their business processes (Gligor et al., 2015; Shams et al., 2021). According to Sambamurthy et al. (2003), OA is the organization’s ability to identify different opportunities in an imperfect market and take necessary precautionary measures to timely cope with the situation and take advantage of such opportunities. Agile organizations have the potential to quickly explore novel ways of doing things, proactively predict and adapt to developments, and seize opportunities (Al-Omoush et al., 2020; Oh and Teo, 2006). Agile organizations are ready for the uncertainty of the business environment and for market volatility. They can afford the opportunity and can quickly respond to gain competitive advantage in the situation (Madhok and Marques, 2014). Sharifi et al. (2006) stated that organizational performance is also based on OA.

OA enables firms to redesign and streamline their business operations to achieve accuracy, cost-effectiveness, and swift response in their organizational processes. It is also helpful to establish the corporation’s network in order to leverage capabilities, logistics, supplier knowledge,
and other assets. Finally, through prompt responses to customers’ changing demands, agile organizations can enhance loyalty and customer satisfaction (Khalifa et al., 2008). An agile firm’s capability to respond according to the changes in the marketplace helps it achieve better performance in the market (Salehzadeh et al., 2017; Zaheer and Zaheer, 1997). However, researchers have argued that OA literature is primarily only linked to organizational reactions to peripheral processes. Thus, it is pertinent to require appropriate explanations in order to understand the underlying processes in more detail (Dabić et al., 2021).

2.5. Environmental dynamism

ED refers to the level of unpredictability and instability in a firm’s environment (Chan et al., 2016). According to Pagell and Krause (2004), ED is the volatility and unpredictability of the organization’s environment. It is considered an important factor in operational management and environmental management (Maletič et al., 2018). Researchers like Raymond (2005) and Sousa and Voss (2008) have suggested that organizations need to develop their infrastructures as per the requirements of the external environment to achieve high performance of SMEs.

A manufacturing firm in the context of the industrial environment has a shorter product life cycle. Their demand changes frequently, and these changes in production and regulation are associated with a higher degree of dynamism (Azadegan et al., 2013; Chan et al., 2016). This also requires higher information from associated processes (Melville and Ramirez, 2008). Thus, as ED significantly impacts business processes and relationships, manufacturing firms must promptly adopt the latest IT infrastructure to respond to dynamic environments.

2.6. Hypotheses development

DPC plays a pivotal role in enabling firms to develop complementary technologies and services (e.g., Xiao et al., 2020). Firms with greater levels of DPC are better positioned to effectively
develop, integrate, and utilize digital platforms and technologies. Furthermore, DPC as a capability based on streamlining business processes and enabling rapid decision making and implementation (Cenamor et al., 2019) allows organizations to swiftly carry out their strategic decisions and initiatives and thus makes them more agile. As such, DPC helps firms to promptly and effectively react to the dynamic environment.

The literature has also established that digital technologies can enable the initiation of forward-looking strategies to make organizations more agile (Sambamurthy et al., 2003). Bresciani et al. (2021) maintained that firms can improve their processes and services through the continuous digital transformation process by effectively responding to complex, changing environments. IT-enabled capabilities, such as IT competencies (Lu and Ramamurthy, 2011), strategic IT alignment (Tallon and Pinsonneault, 2011), IT assimilation (Martinez-Caro et al., 2020), and information processing capability (Huang et al., 2014), have been previously linked with agility. Dubey et al. (2020) argued that data technology enables business managers to identify the dynamic changes in their environment and improve their OA. Researchers like Nissen and von Rennenkampff (2017) established that modern digital capabilities are essential for higher OA. Similarly, Mandal (2019) discovered that digital capabilities assist firms in the careful selection of resources for obtaining enough capabilities to rapidly counter environmental changes, and such firms can thus swiftly redesign their skills and capabilities. We expect that DPC can also create flexibility and swiftness in the organization, thereby helping it to sustain itself in the market. As such, DPC is helpful for an organization to achieve higher OA. Thus, we propose:

**H1**: Digital platform capability is positively associated with the organizational agility of manufacturing SMEs.
There is a visible shift in the debate on human capital due to emerging digital technologies, such as I4.0 infrastructure (Cusumano et al., 2019; Flores et al., 2020). Digital platforms are an important element of the I4.0 infrastructure. Some recent studies have highlighted that characteristics such as innovative business models, efficient use of social media, and continuously adapted cognitive and social skills are important for human capital in the changing organizational context (Baima et al., 2021; Flores et al., 2020; Pinzone et al., 2017). Firms that effectively apply their DPC are likely to improve their human capital due to the enabling role of digital technologies in the improvement of a firm’s workforce and its efficiency in completing organizational tasks. Hence, it is logical to expect DPC to positively influence human capital in an organization.

Since human capital is essential for every organization, the effective management of human capital can contribute to speed and responsiveness in organizational processes and decision making (Al-Omoush, 2021). In particular, human capital can support a firm’s achievement of OA through individuals who promptly put their abilities, skills, and knowledge into use to respond to dynamic conditions. Firms that invest in human capital can enjoy a workforce that is agile and dynamic in the face of a dynamic environment. Likewise, human capital can be an important basis on which to build a firm’s OA. Collectively, human capital can be implemented to cope with multifaceted changes and subsequent organizational adjustments and achieve OA amid dynamic business environments.

The direct link between DPC and OA has already been demonstrated in the paper. Given the previously hypothesized linkages between DPC and OA, we further argue that human capital is expected to positively mediate this relationship as it is closely associated with both constructs. Hence, we hypothesize that:
**H2:** *Human capital mediates the positive relationship between digital platform capability and organizational agility.*

Organizational capital consists of different structures and processes through which business transactions are performed and is comprised of the different tangible and intangible materials that an organization can offer, including copyrights, different software systems, trademarks, processes database, and organizational culture (Zameer *et al*., 2020). It is also important to mention that organizational capital is strongly linked to knowledge (e.g., Mahmood and Mubarak, 2020). This knowledge base is strengthened by the regular and efficient transfer of knowledge from both upstream and downstream sources (Zhang *et al*., 2020). There is also evidence in the extant literature that digital platforms and associated capabilities can significantly enhance the efficiency of such knowledge transfer mechanisms (e.g., Sun *et al*., 2020), thereby strengthening organizational capital.

The greater availability of resources and knowledge sources means that firms with high organizational capital can speedily leverage their resources and achieve greater agility. Firms with greater organizational capital can be expected to be more agile and to be better at utilizing DPC toward the development of agile capabilities because organizational capital underlines a firm’s capacity to organize and develop rare resources and to rapidly adapt to the changes in the business environment. As such, greater availability of organizational capital can be expected to enhance OA and enable better leveraging of DPC in achieving OA. In other words, we expect that organizational capital functions as a linking pin between DPC and OA and conveys the influence of DPC on OA.

**H3:** *Organizational capital mediates the positive relationship between digital platform capability and organizational agility.*
Relational capital is also a significantly researched topic. Lazzarotti et al. (2017), Mubarik et al. (2019), and Naghavi and Mubarak (2019) indicated that relational capital is characterized by interaction, closeness, and goodwill among the employees of an organization and external stakeholders, upstream suppliers, strategic partners, and downstream clients. There is a consensus among scholars that relational capital is strengthened when there are efficient communication mechanisms and collaboration between an organization and its partners (e.g., Ramadas et al., 2018). Digital platforms are a mechanism that can significantly strengthen communication and collaboration between the organization and its partners and act as a relational lubricant (e.g., Cenamor et al., 2019) when such capabilities are present and strong. For example, a firm’s DPC can help improve the relational capital dimension of IC as digital technologies foster value co-creation and business-to-business branding and facilitate innovation networks (Hofacker et al., 2020). Thus, firms applying their DPC can be in a better position to develop relational capability.

In the specific context of emerging market SMEs, studies have also highlighted the potential positive influences of relational capital on OA (e.g., Gligor et al., 2015; Al-Omoush, 2021). Firms can leverage their relational capital and the trust-based collaboration opportunities it brings to quickly react to environmental changes and volatile market demands. Thus, relational capital could help organizations sustain themselves in a competitive environment (Mubarik et al., 2019). Social networks among different stakeholders across the value chain may augment the awareness of the market and thus provide an effective way for firms to engage in knowledge exchange processes (Gupta et al., 2019) in situations in which knowledge is critical for achieving firm agility (Al-Omoush et al., 2021). We expect that higher relational capital can enhance OA and propose that relational capital can become a significant mediating mechanism between DPC and the firm agility relationship. Thus, our next hypothesis is:
**H4:** Relational capital mediates the positive relationship between digital platform capability and organizational agility.

It is commonly accepted that ED is a profound force and an instrumental boundary condition for firms (see, e.g., Dubey et al., 2020; Xiao et al., 2020). In fact, competitive advantage is often defined as the fit between a firm’s strategy and its external environment (Powell, 1992). Some SMEs might be unable to sustain the unpredictable changes in the environment due to the profound influence of ED and thus suffer loss. Therefore, it is necessary to be aware of and account for environmental changes. Organizations in the design of their structures must keep in mind the role of the environment in which they compete (Li et al., 2020; Sousa and Voss, 2008).

Researchers agree that rapid and consistent ED can neutralize or render obsolete any generated benefits for the firms (Chen et al., 2014). The successful application of novel strategic capabilities, such as DPC, often depends on the conduciveness of the external environment (Teece, 2007). Organizations may not be able to achieve high levels of human capital in the presence of high environmental uncertainty and dynamism even if they have DPC because people tend to avoid working in risky and unpredictable conditions. High levels of ED may also curb market visibility and block access to state-of-the-art technologies (Gölgeci et al., 2021), curtailing the role of DPC in the improvement of human capital. This means that low ED is likely to be more conducive than high ED for the utilization of DPC to achieve high human capital in an organization. In consideration of these arguments, we state our next hypothesis:

**H5:** Environmental dynamism negatively moderates the relationship between digital platform capability and human capital such that the relationship between digital platform capability and human capital is stronger when the environmental uncertainty faced by the manufacturing organization is low rather than high.
ED is typically associated with greater uncertainty and unpredictability which is unfavorable to firm operations (Gligor et al., 2015). The uncertainty associated with high ED clouds the judgment of top management and complicates the behavior of firm members (Carson et al., 2006). According to Altschuller et al. (2010), firms invest more in digital technologies to improve OA, especially when high turbulence occurs in the environment.

Under highly dynamic environments, manufacturers may not be able to entirely focus on evidence or information obtained within the organizational structures. They ought to have access to more reliable and appropriate external knowledge to correctly forecast changes and reduce volatility. Firms faced with high ED may find themselves with no certainty as to how to invest in DPC and how to use it in the pursuit of the development of greater levels of IC. Likewise, the uncertainty that ED breeds can impede effective use of DPC in an external environment in which organizational actors cannot be decisive about the right technology to choose and the right time to adopt it, which can harm the development of organizational capital.

**H6:** *Environmental dynamism negatively moderates the relationship between digital platform capability and organizational capital such that the relationship between digital platform capability and organizational capital is stronger when the environmental uncertainty faced by manufacturing organization is low rather than high.*

Relational capital comprises several relationships, including power relationships, market relationships, and mutual collaboration among stakeholders (Kang et al., 2007; Mom et al., 2015; Mubarik et al., 2016). The role of relational capital has manifoldly increased due to the growing complexity of modern-day business processes which are connected through data from different stakeholders (Zahoor and Gerged, 2021). Thus, these relationships are not only affected by internal factors but also by external factors which play a significant role in shifting the balance of these
relationships. A dynamic and unstable environment can strongly influence firms’ capabilities and thus negatively impact relational outcomes (Xiao et al., 2020). Researchers have underlined the challenges of unstable and unpredictable environments in translating knowledge resources and digital capabilities across SMEs into relational capital (Yu and Huo, 2019; Zahoor and Gerged, 2021). Thus, we expect that firms may be in a worse position to translate their DPC into better relational capital in the presence of higher ED. In light of these above arguments, we propose:

**H7:** *Environmental dynamism negatively moderates the relationship between digital platform capability and relational capital such that the relationship between digital platform capability and relational capital is stronger when the environmental uncertainty faced by the manufacturing organization is low rather than high.*

Our conceptual model is depicted in Figure 1. The detailed definitions of the constructs are provided in Appendix A.

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**3. Methodology**

**3.1. Research context**

SMEs play a vital role in Pakistan’s economic growth, and the contribution of SMEs to the GDP of Pakistan is 30% (Bokhari et al., 2020). The emergence of the COVID-19 global pandemic has posed new challenges for firms belonging to all walks of life (Al-Omoush et al., 2020). SMEs in Pakistan are also affected by COVID-19. There is a need to transform the business paradigm from the traditional view toward the latest tools to manage the challenges faced due to this pandemic (Mahmood and Mubarik, 2020). Researchers have argued that after the evolution of I4.0, there is a need for digital transformation for both large businesses and SMEs (Bresciani et al., 2021). COVID-19 has also created challenges for organizational survival in the global marketplace. These challenges require organizations to quickly respond and efficiently work to continue the business
operations and efficiently and effectively manage their supply chains. Due to this pandemic, organizations are required to build resilience to sustain them in the market.

3.2. Data collection and sample
To test this study’s proposed hypotheses, we surveyed manufacturing SMEs of the Hattar Industrial Estate in the Khyber Pakhtunkhwa province, Pakistan. The purpose behind the choice of this sampling frame was that Hattar Industrial Estate is one of the largest industrial estates in Pakistan’s northern province. Another reason for choosing this sampling frame is that Hattar Industrial Estate is adjacent to Punjab cities like Taxila, Rawalpindi, and Islamabad. Their major products are cement, steel, pharmaceuticals, food, beverages, textiles, cooking oil, etc. which are supplied to Punjab province. Those industries which were registered with Hattar Industrialist Association were chosen for data collection. A structured questionnaire was used to collect data from middle and top managers of manufacturing SMEs.

Based on the suggestions and procedures put forward in the literature (Katsikeas et al., 2016), time-lagged data were collected at two different periods from the same respondents. In the first phase, data for the independent, mediator, and moderator variables were collected in October 2020. In the second phase, data for the dependent variable were collected in December 2020. We implemented a time-lagged data collection approach to remedy common-method variance concerns (Podsakoff et al., 2012) and increased the confidence in the direction of linkages as put forward in our hypotheses. Survey questionnaires were distributed for each wave to middle and top managers in the manufacturing SMEs, and completed questionnaires were collected one week later. We distributed 300 questionnaires and 227 of them were returned.

3.3. Measures
This study used DPC as an independent variable, IC as a mediator, OA as a dependent variable, and ED as a moderator variable. DPC refers to the organization’s ability to use the latest advanced
digital tools and technologies as competitive instruments (Cenamor et al., 2019). In this context, the organization uses DPC to enhance their OA. The measures of DPC were adopted from a previous study by Cenamor et al. (2019). DPC was measured on a two-dimensional scale, that is, platform integration and platform reconfiguration.

ICI refers to the firm’s intangible assets which help the firm to gain a competitive advantage. The measures of IC were adopted from the previous studies of Chen et al. (2009) and Liu and Jiang (2020). The three-dimensional scale of IC, which consists of human capital, relational capital, and organizational capital, was used to check the mediating effects of each individual dimension.

OA refers to a firm’s efficient response to the external environment to sustain the market and make necessary decisions. The scale of OA was adopted from the study of Al-Omoush et al. (2020).

ED means the unpredictability and uncertainty in the environment which affects the business operation (Pagell and Krause, 2004). The scale of ED was adopted from the previous study of Azadegan et al. (2013), Chan et al. (2016), and Li et al. (2020). All items were measured on a 5-point scale ranging from 1 “strongly disagree” to 5 “strongly agree”. A detailed list of the items related to the study constructs can be found in Table 2.

3.4. Demographics

Table 1 shows the demographics for this study which was based on 227 respondents. The result shows that most of our respondents were male, that is, 80.2%, and most respondents were 26–35 years old (54.6%). The reason the majority of the respondents were men is that the manufacturing industry in Pakistan is male-dominated. The unit of analysis was SME managers. Most of our respondents had work experience of less than ten years, that is, 82.4%. The demographics of
qualification show that 78.8% of our respondents had a bachelor’s or higher qualification, which means that our respondents were highly educated.

-------------------------------- Insert Table 1 here --------------------------------

4. Data analysis and results
4.1. Confirmatory factor analysis
4.1.1. Model fitness
To test model fitness, we used CMIN/Df and GFI (together called absolute fit measures). Moreover, an incremental fit measure (CFI) and AGFI’s parsimonious fit measures (i.e., AGFI) were used in the study (Keramati et al., 2010). The analysis revealed the following values: CMIN/Df = 3.107; adjusted goodness of fit index (AGFI) = 0.907; goodness of fit index (GFI) = 0.915; comparative fit index (CFI) = 0.952; Tucker-Lewis coefficient (TLI) = 0.947; and root mean square error of approximation (RMSEA) = 0.054. The p-value of 0.000 for the model also confirmed that the model was highly significant. This confirmed the desired fitness of the model (CMIN/Df = 3.107 and p-value ≤ 0.05) as per the recommendations of Hair et al. (2010).

4.1.2. Convergent validity and reliability
Table 2 depicts the standardized estimates of variables in its CFA. As per Cua et al. (2001), items with factor loadings above 0.5 were included. Next, average variance extracted (AVE) was calculated in MS Excel with the help of the formula AVE =∑ λ²/ n. Here, λ = the standardized factor loadings of the items, and n = the number of construct items. According to Fornell and Larcker (1981), AVE values of 0.50 or higher specify adequate convergent validity, so our data supports adequate reliability.

Next, we calculated construct reliability as (∑ λ)²/ (∑ λ)²+∑ δ, δ=1- λ². The rule of thumb for construct reliability (CR) is that an estimate of 0.70 or higher suggests good reliability
(Netemeyer et al., 2003). The data shows that the CR value was above 0.70 which indicates that the data is reliable.

The values of Cronbach alpha demonstrated the internal consistency or reliability of each item on the questionnaire. The standard to check reliability for its acceptability is $\geq 0.70$ (Nunnally, 1978). The data shows that the Cronbach alpha value was above 0.70 which indicates that the data is reliable.

-------------------------- Insert Table 2 here --------------------------

The rule of thumb for a construct reliability (CR) estimate is that 0.70 or higher suggests good reliability (Netemeyer et al., 2003). Reliability between 0.60 and 0.70 may be acceptable provided that other indicators of a model’s construct validity are good. The data shows that the CR value is above 0.70 which indicates that the data is reliable.

The above-mentioned values of Cronbach’s alpha demonstrate the internal consistency or reliability of each of the questionnaire items. The standard to check the reliability for its acceptability is $\geq 0.70$ (Nunnally, 1978). The data shows that the Cronbach alpha value is above 0.70 shows that the data is reliable.

4.1.3. Discriminant validity

Table 3 shows discriminant validity and the Heterotrait-Monotrait Ratio (HTMT). The results of this study confirm the validity of our variables, and all the values obtained from HTMT are below 0.90 (Henseler et al., 2015) which confirms the discriminant validity in our data.

-------------------------- Insert Table 3 here --------------------------

4.1.4. Descriptive statistics and correlation matrix

Table 4 represents the descriptive statistics which include mean and standard deviation values. The correlation among all the variables is also mentioned in the table. The table shows that the mean value is above 3 and that the standard deviation is within the range, that is, between +1 and -1.
Hence, all the values of variables are within the range. Table 4 shows that all of the items are positively correlated except the variable ED. The correlations between ED and DPC and ED and organizational capital are negative.

--- Insert Table 4 here ---

All the values on the diagonal of the tables represent the square root of AVE. According to Fornell and Larcker (1981), the square root of AVE of a particular variable should be higher than all the possible correlations with other variables. The above table 4 shows that the square root of AVE is higher in all of the correlations among the variables, which also fits the criteria of discriminant validity.

4.3. Hypotheses testing

Structural Equation Modeling (SEM) was used to test the hypotheses proposed in the study with the use of AMOS software. Many researchers have used the SEM technique to test similar models (e.g., Gawankar et al., 2020; Henseler et al., 2015). SEM was used to test the hypotheses of direct effect, mediating effect, and moderated mediation effect. These can be tested by using software AMOS version 24. The Preacher and Hayes process in AMOS with 2000 bootstrap samples was used to test the mediating effect; likewise, the Preacher and Hayes process method in AMOS with 2000 bootstrap samples was used to test the moderated mediation effect. In both instances, confidence intervals of 95%, estimates of standard errors, and p-values were obtained.

Table 5 shows the direct effect calculated by using SEM. Results show that DPC is positively linked to OA of manufacturing SMEs (H1 supported). This shows that manufacturing SMEs having higher DPC which will lead toward higher OA.

--- Insert Table 5 here ---

The mediating effect for the research model was calculated by using Structural Equation Modeling in AMOS. Table 6 shows the mediating effect of the subdimensions of IC between DPC
and OA. For Hypothesis H2, results show that human capital mediates the relationship between DPC and OA. The p-value is <0.05, and upper and lower confidence intervals do not include zero. Hence, H2 is supported. The mediating effect of organizational capital between DPC and OA shows a significant relationship (p<0.05), and zero does not exist between upper and lower confidence intervals. Hence, H3 is supported.

Table 6 shows that the mediating effect of relational capital between DPC and OA is positive and significant. The result suggests that relational capital mediates between this relationship. The p-value is <0.05, and upper and lower confidence intervals do not include zero. Hence, H4 is supported.

For moderation effect, the Preacher and Hayes process method was used to calculate Structural Equation Modeling in AMOS. Table 7 shows the results for hypotheses H5, H6, and H7. The results show the significant effect of ED moderation at low, medium, and high low values of IC dimensions. Figure 2 also shows that the slopes for focal concepts intersect, which signifies that ED moderates the relationship between DPC and the three IC dimensions. Thus H5, H6, and H7 are supported.

5. Discussion and implications

Digital platforms are key enablers of multisided and multilateral processes that influence firms to dynamically manage their portfolios to improve the competitive position of their product lines (Rai and Tang, 2010). Recently, digital platforms have become both challenging and important for organizations and, in particular, for manufacturing SMEs (Cenamor et al., 2019). Digital
technologies bring changes to individuals and organizations alike. Employees are continuously engaged in various activities that generate a large amount of data for organizations that is increasingly touted as the world’s most valuable resource (Economist, 2017). Organizations are compelled to use these increasingly ubiquitous and indispensable yet challenging platform capabilities to process and leverage data for superior value creation. They are bound to invest in digital technologies to convert their traditional business approaches to e-business to gain a competitive advantage over a competitor which also leads to OA (Martinez-Caro et al., 2020). However, the contextualized understanding of methods through which organizations take advantage of digitalization is not yet developed to its full extent.

The purpose of our research was to fill this gap by untangling the indirect role of DPC in OA through IC. This study also examined the moderator role of ED. The findings of the study show that DPC will enhance OA; moreover, all three types of IC, namely human capital, organizational capital, and relational capital, mediate the positive relationship between DPC and OA. We also found evidence that ED negatively moderates the relationship between DPC and IC.

Our findings are consistent with and build upon previous literature in this domain. Other researchers have established the positive impact of digital capabilities (Dubey et al., 2020; Chen et al., 2020), especially platform capabilities, on performance outcomes at the organizational level (Cenamor et al., 2019; Xiao et al., 2020), including OA (Chen and Siau, 2020; Mandal, 2019; Mikalef and Pateli, 2017). Prior studies on OA have also established that it has clear links to human capital (e.g., Dyer and Schafer, 2003), organizational capital (e.g., Skare and Soriano, 2021), and relational capital (e.g., Cai et al., 2014). We extend these findings and reveal that IC meditates the link between DPC and OA, and ED weakens the link between DPC and IC.

5.1. Theoretical implications
This study contributes in several ways to the theorization and understanding of DCs, and particularly DPC, in the context of manufacturing SMEs. First, based on the finding that DPC plays a positive role in the development of OA, we strengthen and offer empirical evidence for the lesser-researched literature stream which has highlighted the importance of DPCs for their agility and competitiveness (e.g., Björkdahl, 2020; Bresciani et al., 2021). Hence, our paper strengthens the theorization of both DPC and OA for manufacturing firms, especially in emerging markets where digital capabilities have been found to improve performance and overcome environmental uncertainties (e.g., Khin and Ho, 2019). This important finding that DPC enhances OA leads to further theoretical implications on the important role of IC in this context.

Our findings depict that IC (comprised of human capital, organizational capital, and relational capital) is positively associated with OA. It also mediates the relationship between DPC and OA and conveys the role of DPC in OA. The importance of IC to the study of different organizational capabilities like OA has been established in prior literature (e.g., Al-Omoush, 2021; Hsu and Fang, 2009). However, prior research has primarily focused on the role of external factors in strengthening DPC, particularly at the industrial level (e.g., Gawer, 2014). We strengthen the theorization of these constructs by being one of the rare studies to specifically highlight how IC (human capital, organizational capital, and relational capital) enhances OA and mediates the link between DPC and OA. In the specific context of emerging markets, prior scholars have shown that IC enhances OA and its different dynamics (e.g., Al-Omush et al., 2020; Baima et al., 2021; Zhang et al., 2018). However, incorporating the key role played by DPCs in this context enhances the theorization of both OA and IC in the emerging markets context due to the importance of digital platforms in the current business climate for firms of all sizes.
Finally, COVID-19 has profoundly impacted the manufacturing industry, and the study of the role played by ED is necessary to identify that ED can significantly influence the relationship between DPC and IC. The study’s findings show that ED plays a negative moderating role and that the managers of manufacturing organizations need to consider the outside environment in order to maintain the smooth functioning of business operations in manufacturing SMEs that operate in emerging markets. In particular, our study highlights the perils of ED concerning the link between DPC and IC. It offers a cautionary note on the interaction between ED and DPC in explaining IC and ensuing OA. As such, our study showcases another dark side of ED in emerging countries like Pakistan (Gölgeci et al., 2019) and how it curtails the development of IC and OA of emerging market manufacturing SMEs.

5.2. Managerial implications

Our paper also offers several managerial implications. The transformation into digital technology benefits the ability of organizations to manage a growing number of relationships among stakeholders and the increasing exchange of information within and across organizations (McAfee et al., 2012). However, the implementation of digital technology in an organization is currently limited, and most of a firm’s effort regarding digitalization is unsuccessful (Frishammar et al., 2018). The adoption of digital technology has become a strategic but complicated decision for every organization which involves core routines and resources (Yeow et al., 2018). More specifically, we show that the sole use of ICT does not bring significant improvement in terms of the attainment of greater levels of OA but instead requires a DPC to perform to achieve the desired results.

Due to the scarcity of resources and capabilities, manufacturing SMEs must understand the hurdles that affect the implementation of digital platforms in the organization. Manufacturing
SMEs have limited resources due to their size. Thus, they often face issues regarding the implementation of digital technologies. The platform approach may enable manufacturing SMEs to successfully implement digital technologies that enhance the organization’s agility. These platforms help organizations create intellectual value in their organizations which will benefit the organization in the long run. This study’s findings show the indirect role of DPC in OA through IC. It shows that the agility of manufacturing SMEs is increased by having DPC which enhances the organization’s IC. Thus, managers focus their attention on improving human, organizational, and relational capital which would make their organizations more agile and flexible and thus able to better respond in the context of technological and environmental changes.

Further, the results of the moderating variable of ED help managers of manufacturing SMEs understand how environmental factors like COVID-19 impact business performance and how timely action is required to enhance the agility of manufacturing SMEs.

6. Conclusion, limitations, and future research

In the era of I4.0, digital manufacturing platforms enable firms to adopt data-driven strategies during all the product life cycle phases, ranging from raw material procurement to all the subsequent value-adding processes. They develop efficient vertically- and horizontally-integrated manufacturing systems (Frank et al., 2019). DPC enables organizations to integrate strategic knowledge sources while reconfiguring internal and external resources to better respond to dynamic and volatile environments (Cenamor et al., 2019). DPC for such firms is directly linked to their competitiveness and performance. However, the complexity of digitalization and digital technologies indicates that the DPC and agility link is further mediated by IC, that is, all three dimensions of human capital, organizational capital, and relational capital intervene in this relationship. This relation is also negatively moderated by ED.
Although this research is one of the first studies to empirically test the role of DPC in OA in the emerging market manufacturing SMEs, the study is not without limitations. The study focuses on IC in terms of human, relational, and organizational capital. Future research may use other dimensions of IC, such as technological, social, and innovation dimensions. The second limitation of this study regards data collection. Data were collected from specific geographical locations in Pakistan, that is, manufacturing SMEs from Hattar Industrial Area, which limits the generalizability of the findings. However, in view of the specificity of the Pakistani emerging market context, this study offers a good basis for future studies to explore these dynamics in other sectors in Pakistan. Finally, this study has examined the moderating role of ED. Future research can consider other moderators, such as interorganizational trust and supply chain flexibility, to investigate the impact of digital platforms in manufacturing SMEs.

References


Economist. (2017). The world’s most valuable resource is no longer oil, but data. The Economist. Available online at [https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data](https://www.economist.com/leaders/2017/05/06/the-worlds-most-valuable-resource-is-no-longer-oil-but-data).


Fig. 1. Research model
Fig. 2 Slope of moderation effect of environmental dynamism between digital platform capability and intellectual capital
Table 1 Demographics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage (%)</th>
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<td></td>
<td>36-45</td>
<td>42</td>
<td>18.5</td>
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<tr>
<td></td>
<td>46-55</td>
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<td>1.8</td>
</tr>
<tr>
<td></td>
<td>&gt;55</td>
<td>2</td>
<td>.9</td>
</tr>
<tr>
<td>Gender</td>
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<td>80.2</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>45</td>
<td>19.8</td>
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<tr>
<td>Experience</td>
<td>&lt;10 years</td>
<td>187</td>
<td>82.4</td>
</tr>
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<td></td>
<td>10-20 Years</td>
<td>35</td>
<td>15.4</td>
</tr>
<tr>
<td></td>
<td>21-30 Years</td>
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<td>1.3</td>
</tr>
<tr>
<td></td>
<td>&gt; 30 Years</td>
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<tr>
<td>Qualification</td>
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<td></td>
<td>Master</td>
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<tr>
<td></td>
<td>MS/M.Phil.</td>
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<td>11</td>
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N=227
Table 2 Convergent validity and reliability

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor Loading ($\lambda$)</th>
<th>CR</th>
<th>AVE</th>
<th>Cronbach Alpha</th>
</tr>
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<tr>
<td><strong>Organizational Agility (OA)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OA1 “Promptly pursuing the opportunities and threats posed by the evolution of the COVID-19 crisis”</td>
<td>0.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OA2 Sensing dynamic environmental changes posed by the coronavirus pandemic already underway and predicting swiftly what to do</td>
<td>0.855</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>OA3 Improving the agility of decision making in responding to challenges posed by COVID-19</td>
<td>0.787</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OA4 Adapting resources, processes, and technologies to meet the needs of the changing environment caused by the coronavirus pandemic</td>
<td>0.782</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OA5 Considering new pricing, marketing, production, and/or alliance actions</td>
<td>0.657</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OA6 Our organization works hard to promote the flow of information with its suppliers and customers”</td>
<td>0.741</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Digital Platform Capability (DPC)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPC1 “Our platform easily accesses data from our partners’ IT systems”</td>
<td>0.640</td>
<td>0.894</td>
<td>0.549</td>
<td>0.896</td>
</tr>
<tr>
<td>DPC3 Our platform has the capability to exchange real-time information with our partners</td>
<td>0.636</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPC4 Our platform easily aggregates relevant information from our partners’ databases (e.g., operating information, business customer performance, cost information etc.)</td>
<td>0.771</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPC5 Our platform is easily adapted to include new partners</td>
<td>0.636</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPC6 Our platform can be easily extended to accommodate new IT applications or functions</td>
<td>0.799</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPC7 Our platform can be easily extended to accommodate new IT applications or functions</td>
<td>0.827</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPC8 Our platform consists of modular software components, most of which can be reused in other business applications”</td>
<td>0.840</td>
<td></td>
<td></td>
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<tr>
<td><strong>Human Capital (HC)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC1 “Employees have suitable education to fulfill their jobs”</td>
<td>0.708</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HC3 Employees hold suitable work experience for accomplishing their job successfully</td>
<td>0.793</td>
<td></td>
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</tr>
<tr>
<td>HC5 Employees understand that doing this job well is a reward in itself</td>
<td>0.730</td>
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<tr>
<td>HC6 Considering the time spent on the job, employees feel thoroughly familiar with their tasks</td>
<td>0.644</td>
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<td>HC7 Mastering their jobs means a lot to our employees”</td>
<td>0.714</td>
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</tbody>
</table>
Organizational Capital (OC)  
OC1 "Employees realize the relationships among authority, responsibility, and benefit  
OC2 Employees effectively construct an information system  
OC3 Employees effectively utilize their information system  
OC4 Employees know well about the contents of a company’s culture  
OC5 Employees clearly recognize the company’s perspective  
OC6 Employees can operate an efficient business process  
OC7 Employees can effectively share their knowledge with each other”  

Relational Capital (RC)  
RC2 “Employees have mutual respect with the partners  
RC3 Employees have mutual trust with the partners  
RC4 Employees have personal friendships with the partners”  

Environmental Dynamism (ED)  
ED1 “Major changes in the modes of production and/or service provision  
ED2 Major changes in Consumer demographics  
ED3 Frequent and major changes in government regulations  
ED4 Short product life cycle”  

Note: AVE = \( \sum \lambda^2 / n \), CR= \( (\sum \lambda)^2 / (\sum \lambda)^2 + \sum \delta \), \( \delta = 1 - \text{AVE} \)

<table>
<thead>
<tr>
<th>Table 3 Discriminant validity</th>
</tr>
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<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Organizational Agility (OA)</td>
</tr>
<tr>
<td>Digital Platform Capability (DPC)</td>
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<td>Human Capital (HC)</td>
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<tr>
<td>Organizational Capital (OC)</td>
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<td>Environmental Dynamism (ED)</td>
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<td>Relational Capital (RC)</td>
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Table 4. Descriptive statistics, correlation matrix and the square root of AVE

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<th>Variables</th>
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<td>Organizational Agility</td>
<td>0.772</td>
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<td>Digital Platform Capability</td>
<td>.711**</td>
<td>.740</td>
<td></td>
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<tr>
<td>Organizational Capital</td>
<td>.639**</td>
<td>.716**</td>
<td>.779</td>
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<tr>
<td>Human Capital</td>
<td>.612**</td>
<td>.605**</td>
<td>.763**</td>
<td>.723</td>
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<tr>
<td>Relational Capital</td>
<td>.613**</td>
<td>.571**</td>
<td>.767**</td>
<td>.718**</td>
<td>.740</td>
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<td>Environmental Dynamism</td>
<td>.035</td>
<td>-0.23</td>
<td>-0.026</td>
<td>.013</td>
<td>.039</td>
<td>.780</td>
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<tr>
<td>Mean</td>
<td>3.9170</td>
<td>3.7193</td>
<td>3.6142</td>
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<td>Std. Deviation</td>
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<td>.62989</td>
<td>.68864</td>
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<td>.88641</td>
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Table 5 Direct effects

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<thead>
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<th>Hypothesis</th>
<th>Construct</th>
<th>Estimate</th>
<th>SE</th>
<th>CR</th>
<th>p-value</th>
<th>Decision</th>
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<tbody>
<tr>
<td>H1</td>
<td>DPC→OA</td>
<td>.469</td>
<td>.076</td>
<td>6.289</td>
<td>***</td>
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Table 6 Mediation effect

<table>
<thead>
<tr>
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<th>Construct</th>
<th>Std. Effects</th>
<th>95% CI</th>
<th>p-value</th>
<th>Decision</th>
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<tbody>
<tr>
<td>H2</td>
<td>DPC→OC→OA</td>
<td>.205</td>
<td>.103</td>
<td>.304</td>
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<td>H3</td>
<td>DPC→HC→OA</td>
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<td>.087</td>
<td>.285</td>
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<td>H4</td>
<td>DPC→RC→OA</td>
<td>.183</td>
<td>.092</td>
<td>.282</td>
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Table 7 Moderation effects

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Construct</th>
<th>Std. Effects</th>
<th>95% CI</th>
<th>p-value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>H5</td>
<td>DPCxED→HC (Low)</td>
<td>.681</td>
<td>.502</td>
<td>.877</td>
<td>0.001</td>
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<td></td>
<td>DPCxED→HC (Medium)</td>
<td>.578</td>
<td>.409</td>
<td>.750</td>
<td>0.001</td>
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<td>DPCxED→HC (High)</td>
<td>.474</td>
<td>.193</td>
<td>.731</td>
<td>0.001</td>
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<tr>
<td>H6</td>
<td>DPCxED→OC (Low)</td>
<td>.825</td>
<td>.643</td>
<td>1.026</td>
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<td>DPCxED→OC (Medium)</td>
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<td>.572</td>
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<td>DPCxED→OC (High)</td>
<td>.668</td>
<td>.390</td>
<td>.930</td>
<td>0.001</td>
</tr>
<tr>
<td>H7</td>
<td>DPCxED→RC (Low)</td>
<td>.569</td>
<td>.378</td>
<td>.790</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>DPCxED→RC (Medium)</td>
<td>.508</td>
<td>.332</td>
<td>.689</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>DPCxED→RC (High)</td>
<td>.448</td>
<td>.167</td>
<td>.712</td>
<td>0.001</td>
</tr>
</tbody>
</table>
## Appendix-A

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>No of items</th>
<th>Reference (items adapted from)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Platform Capability</td>
<td>“Digital platform capability refers to the use of digital information technology which will be helpful regarding the exchange of different activities among partners. This can be done through platform integration and configuration” (Cenamor et al., 2019)</td>
<td>8</td>
<td>(Rai and Tang, 2010; Cenamor et al., 2019)</td>
</tr>
<tr>
<td>Intellectual Capital</td>
<td>“Intellectual capital is the intangible resource of the organization includes skills, knowledge, training or information which helpful for the organization to gain competitive advantage”. (Liu and Jiang, 2020).</td>
<td>7</td>
<td>Liu and Jiang, 2020; Chen, Shih, and Yang (2009),</td>
</tr>
<tr>
<td>Human Capital</td>
<td>“Human capital is the intangible asset of the company which includes level of education, experience, intrinsic and extrinsic motivation of the employee”. (Liu and Jiang, 2020).</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Organizational Capital</td>
<td>“Organizational capital ability of the firm to transform according to market requirement and to quickly accept environmental changes” (Liu and Jiang, 2020).</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Relational Capital</td>
<td>“Relational capital refers to the establishment of network of the organization’s business. The network includes customers, supplier and stakeholder of the organization in order to enhance the corporation among these for the smooth flow of business operation” (Chan et al., 2016)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Environmental dynamism</td>
<td>“Environmental dynamism is the degree of instability and volatility of the firm’s environment.”</td>
<td>4</td>
<td>Azadegan et al., 2013; Chan et al., 2016</td>
</tr>
<tr>
<td>Organizational agility</td>
<td>“Organizational agility is the capability of the organization to identify the opportunities of imperfect market and take necessary proactive measure in order to respond to get opportunity timely when needed. It is the ability of the organization to change themselves according to demand of market.” (Al-Omoush et al., 2020)</td>
<td>6</td>
<td>(Sambamurthy et al., 2003; Nafei, 2016; Wamba et al., 2019; Al-Omoush et al., 2020)</td>
</tr>
</tbody>
</table>