Asia Pacific Journal of Management (2024) 41:867–901
https://doi.org/10.1007/s10490-023-09879-4

# Nexus of digital platforms, innovation capability, and strategic alignment to enhance innovation performance in the Asia Pacific region: a dynamic capability perspective

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Accepted: 12 March 2023 / Published online: 21 March 2023


## Abstract

The direct influence of digital platforms on organizational efficiency, financial performance, and strategy attracts the close attention of researchers. The complex mechanisms and pathways of digital platforms on transformation capacity, however, are still unclear at the global and Asia Pacific levels. Drawing on dynamic capability theory, we empirically explore how digital platforms augment organizational innovation performance. We advance the current literature on digital platforms by finding that digital platform capability boosts an organization's dynamism and innovation performance. Furthermore, we extend the literature by revealing that, indirectly, innovation capability and strategic alignment have a substantial influence over digital platform capability and innovation performance. Finally, the study formulates a conceptual model from a dynamic capability perspective, rather than from a resource-based view, and test it using the responses collected from 153 Pakistani manufacturing firms.

**Keywords** Digitalization · Digital platform capability · Innovation capability · Strategic alignment · Innovation performance · Asia Pacific region · Dynamic capability view

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## Introduction

In the modern hyper-competitive, turbulent, and dynamic business environment, businesses look towards digital technologies and related disruptive innovations to improve performance and competitiveness, and these are swiftly transforming corporate processes, enabling them to sense and seize opportunities (Bag et al., 2021; Castillo et al., 2021; Chen et al., 2021), and operationalize business goals (Nambisan et al., 2019). Given the unprecedented benefits that digitalization offers, Sia et al. (2021) understand the need to contextualize digital technologies in organizations, recommending that managers *"jump onto the digital transformation bandwagon."* Benitez et al. (2022) find that, in 2018, 85% of companies invested in digital technologies, while 90% prioritized digitalization in the strategic management process (Sia et al., 2021). Current research highlights the potential of digital platforms to deliver peak competitiveness (Cenamor et al., 2019; Ferreira et al., 2019). Researchers identify the need to routinize digital platforms in organizations (Aryan et al., 2020; Cenamor et al., 2019; Trabucchi & Buganza, 2020), and the implications of the latest digital technologies, such as smart devices, software, and complementary technological structures, enable firms to homologize, edit, and share information on a massive-scale (Parker et al., 2016; Yoo et al., 2010). They facilitate knowledge sharing and management within and outside the organization (Cennamo, 2018), enhancing the ability to connect and coordinate business-to-business (B2B) and business-to-consumer (B2C) relationships (Bag et al., 2021; Cusumano et al., 2019). Their application in business has increased exponentially as they replace obsolete business methods with new ones (Kazan et al., 2018). Moreover, digital platforms are crucial for generating value creation ecosystems as they grow (Cennamo, 2018; Cennamo & Santaló, 2019; Jacobides et al., 2018). In this regard, machine learning, artificial intelligence, and big data are becoming priorities for organizations competing in the digital platform ecosystems (Gao & Sarwar, 2022; Makarius et al., 2020; Subramaniam et al., 2019) which may feed innovation. Hence, digital platforms are a promising research field that potentially leads to new landscapes in the field of organizational innovation (Libert et al., 2016).

Innovation is vital to succeeding in our globalized world (Cozzarin, 2017; Scuotto et al., 2022), but complicated products and services development process, shorter product life cycles, and persistently evolving market situations make it a challenge to achieve (Gao & Sarwar, 2022). It is a multifaceted notion that evolves organizational processes, products, and services, aiming to beat the competition and enhance performances (Du et al., 2022; Ferreira et al., 2019). Studies acknowledge efficient knowledge management and learning orientations as the paradigm of innovativeness, competitiveness, and performance (Baker et al., 2022; Farzaneh et al., 2022), for which they recommend the implementation of the latest information and communication-based technological systems to create efficiencies in knowledge management (Cenamor et al., 2019; Makarius et al., 2020), facilitating the development of unique products and services (Di Vaio et al., 2021), flexibility (Karim et al., 2007), transformation (Grover & Segars, 2005), and productivity (Staehr et al., 2012). Among them, one of the most sophisticated technological structures is digital platforms (Chen et al., 2022) that can improve the capacity to acquire and deploy knowledge resources at

an unprecedented scale and speed (Cenamor et al., 2019). Furthermore, they possess the potential to align organizational competencies and resources with the external market and elevate the organization's capability to foresee potential business opportunities and threats, which is why digitalization and digital platforms are prioritized in the strategic management process (Yeow et al., 2018). It is understood that digitalization serves knowledge management (Di Vaio et al., 2021), innovation (Ardito et al., 2021; Benitez et al., 2022), sustainability (Guandalini, 2022), environmental orientation (Ardito et al., 2021), and performance (Cenamor et al., 2019; Felipe et al., 2020). However, the impact of these platforms on innovation performance is poorly-understood, constituting a critical research gap. This void is even more prominent in the Asia Pacific region, where entire economies are already engaged in digital transformation. To facilitate successful transformation in the region, there is a need to understand whether digital platform capability (DPC) elevates innovation performance; exploring this association in the Asia Pacific context is the primary purpose of this study.

Companies in Asia Pacific strive to be more innovative as a way to facilitate economic progress, to provide inimitable products and services (Jain, 2020; Yu et al., 2014), and to create a competitive edge and performance gains (Magni et al., 2022; Teece, 2018a). The tremendous growth of innovative economies such as China, India, and Bangladesh inspires other regional economies to explore and exploit the phenomenon (Bruton et al., 2021; Nair et al., 2015; Tomizawa et al., 2020). Researchers like Bruton et al. (2021), Magni et al. (2022), and Shamim et al. (2021), acknowledge the essentialness of innovation in the of Asia Pacific context and explore the phenomenon in this region, constituting a knowledge community that characterizes and operationalizes the innovation processes purely based on local realities (Ananthram & Chan, 2021; Loon & Chik, 2019; Moradi et al., 2021; Ramdani et al., 2020; Tang et al., 2021; Wang et al., 2021; Zhao et al., 2020). The demand for innovation in the region is urgent, but companies are struggling to achieve it (Le & Lei, 2018). Being innovative depends heavily on the capacity to transmute resources into unique products and processes, which is known as innovation capability (Zhou et al., 2017), a key source of competitiveness and productivity (Le & Lei, 2018; Liao et al., 2017; Charterina et al., 2017; Prasad & Junni, 2016; Tian et al., 2018) highlighted the importance of developing innovation capability and called for inquiries to explore its unknown prospects (Rajapathirana & Hui, 2018), especially the antecedents that foster or suppress such capability. In this vein, Benitez et al. (2022) argue that innovation capability hugely depends on how successfully a company operationalizes the latest technological structures. Consistent with this, we argue that systems such as digital platforms have the potential to amalgamate different aspects of innovation capability, i.e., transform knowledge (Lawson & Samson, 2001), adapt to the environment (Helfat & Raubitschek, 2018; Teece, 2017, 2018b), and create unique outputs (Neely et al., 2001). They enable firms to acquire information resources from environments (internal and external) and shape innovation capability by elevating their sensing, seizing, and learning capacities, ultimately enhancing innovation performance. We intuitively understand that technological capabilities, such as DPC, are embedded in organizational dynamism and innovation performance. In the current era of Industry 4.0, researchers ostensibly argue that DPC, innovation capability, and performance

are closely related; however, this argument lacks empirical evidence, especially in the Asia Pacific context. Thus, empirically exploring the relationship between DPC, innovation capability, and innovation performance in the Asia Pacific region is the second objective of the study.

Companies attempt to implement the latest technological structures, such as digital platforms, artificial intelligence (AI), and the Internet-of-Things (IoT) to achieve business objectives (Gao & Sarwar, 2022; Sia et al., 2021; Yin & Yu, 2022). For instance, Alibaba's platform facilitates corporate internationalization processes in New Zealand (Jin & Hurd, 2018), even as these technological structures support China's prominent development facets (innovation, communication, coordination, sharing, openness, and unique product development), enhance Chinese output year by year, achieve high-quality innovation, and economic progress (Xia & Weng, 2021; Yin & Yu, 2022), thereby continuing the development of the world's second-largest economy. These outcomes inspire other regional economies to follow China's lead in implementing digital platforms that facilitate easy communication as well as various management processes (Benitez et al., 2022; Melville et al., 2004). However, operationalizing these platforms is challenging, and several organizations have already failed to do so due to their complex nature and limited understanding (Benitez et al., 2022; Cenamor et al., 2019). Following Gao and Sarwar (2022), we argue that a lack of strategic alignment is the major reason for these failures, where managers fail to leverage the alignment of vision, mission, and objectives with the information systems. Strategic alignment is about harmonizing information system strategies with business strategies (Shao, 2019; Wang et al., 2015) to serve productivity, performance, and success (Huerta et al., 2013; Merali et al., 2012; Wang et al., 2015). This should be management's top priority, and we strive to find its potential antecedents, which subsequently facilitate greater competitiveness (Pearlson et al., 2019) and performance (Yayla & Hu, 2012). In this context, this study puts forward digital platforms as the potential antecedent of strategic alignment as they are an essential component of strategic management process (Yeow et al., 2018), which facilitates knowledge management within and outside the organization (Berente et al., 2019). We assert that digital platforms facilitate decision-making quality through the efficient acquisition of knowledge, and they elevate organizational capacity to scan the business environment for potential opportunities, which enables them to align the business and information system strategies, yielding innovation performance. Our assumption is in accordance with that of Abbas et al. (2019), Cenamor et al. (2019), Helfat and Raubitschek (2018), and Yunis et al. (2018), who assert that information and communication technologies produce intended outcomes indirectly, and that this warrants further investigation. Expanding this stream, we affirm that DPC yields innovation performance through strategic alignment, and examining this underdeveloped association in the Asia Pacific context is the third objective of the study.

Our main proposition is to explore the direct and indirect association of DPC with innovation performance in the Asia Pacific context and answer the following research questions: Through what pathways and mechanisms do digital platforms create value? Does DPC facilitate corporate innovation performance? Do innovation capability and strategic alignment impact the relationship between DPC and

innovation performance? Do innovation capability and strategic alignment mediate the association of DPC and innovation performance? The study deploys PLS-SEM approach to analyze the responses collected from 153 Pakistani manufacturing firms.

Based on dynamic capability theory (Gao & Sarwar, 2022; Teece, 2018a, b; Teece et al., 1997), we extend the literature on digital transformation (Benitez et al., 2022; Guandalini, 2022), innovation capability (Sarwar, Khan, Yang, et al., 2021; Zhang & Merchant, 2020), strategic alignment (Gao & Sarwar, 2022; Shao, 2019), innovation performance (Ardito et al., 2021; Benitez et al., 2022), and the Asia Pacific region (Du et al., 2022; Scuotto et al., 2022) in four ways. *First*, despite its obvious significance, the concept of DPC has not been properly conceptualized and examined. Limited researches, such as Cenamor et al. (2019) and Ingram Bogusz et al. (2019), explore DPC and its essential role in the digitalized economy. Benitez et al. (2022) find a lack of understanding of what DPC actually refers to, and what it brings to the table in terms of innovation performance. It is therefore crucial to understand what digital platforms are capable of, and how they affect innovation performance. We extend this understanding by revealing that DPC does indeed enhance innovation performance. *Second*, we intuitively understand that digital technologies, such as digital platforms, hone a company's ability to innovate, thereby fostering innovation performance. However, this indirect association lacks empirical proof; indeed, Rajapathirana and Hui (2018) argue that the predictor and criterion of innovation capability are not extensively studied, and call for further research. We expand these research streams by empirically revealing that DPC fosters innovation capability, which consequently enhances innovation performance. *Third*, despite the prolific advantages of digitalization, several organizations have failed in their attempts (Cenamor et al., 2019) because their business and information system strategies were not in alignment. We assert that DPC enhances strategic alignment, thereby boosting innovation performance. This study significantly advances the literature by revealing that strategic alignment mediates the association of DPC and innovation performance. *Fourth*, the study presents a significant contextual novelty. Companies in the region of Asia Pacific realize the significance of digital technologies, and they seek to leverage them to create value, as done in Sweden, America, and Europe (Ardito et al., 2021; Benitez et al., 2022; Cenamor et al., 2019; Sia et al., 2021). This enquiry extends the knowledge by exploring the associations among constructs in the Asia Pacific context, specifically in Pakistan.

## Theoretical development

In the modern business world, the resource-based view (RBV) highlights the significance of accumulating tangible and intangible resources (Barney, 1991, 2001). However, this view does not shed light on how to maintain a competitive edge in a continuously evolving business environment (Baker et al., 2022). Gao & Sarwar (2022) also assert that the RBV only emphasizes heterogeneous resource acquisition, but does not provide sufficient information about resource utilization and adaptation to change in the current turbulent business environment.

To fill these voids, scholars introduce the concept of dynamic capabilities, (i.e., Teece et al., 1997), which is both a reaction to, and an extension of, RBV. This view focuses on the development of dynamic organizational competencies and defines them as the capacity to create, transform, and integrate corporate capabilities to adapt to a continuously evolving market environment. It advocates building inimitable resources and capabilities which ultimately create value in terms of competitiveness, innovation, and performance (Gao & Sarwar, 2022; Teece, 2007), and enable companies to screen the external environment for potential opportunities and threats to maintain a competitive edge via fostering, integrating, and transforming their resources and competencies (Teece, 2007). Dynamic capability includes routine processes, behaviors, and patterns that facilitate change and the decision-making processes (Baker et al., 2022). Conclusively, dynamic capabilities are agents of change facilitating firms in the evaluation of required changes to their resources and capabilities to maintain a competitive edge in evolving market environment (Gnizy et al., 2014; Wilden et al., 2013). Dynamic capabilities depend on the approach taken towards learning and a company's capacity to identify, collect, combine, and utilize knowledge (Baker et al., 2022; Gao & Sarwar, 2022). According to Mikalef et al. (2020) and Mikalef and Pateli (2017), the implication of smart information and communication technology (ICT), and the development of ICT-enabled capabilities, revolutionizes the knowledge management processes, effectively becoming extensions of the original dynamic capabilities.

In accordance with this research line, we assert that DPC is the dynamic capability that improves innovation performance by facilitating knowledge management (identification, assimilation, distribution, and application) and learning procedures. The main purpose of this study is to align dynamic capabilities so that they collectively improve a company's innovation capability. Studies acknowledge that the discussion about digital platforms is in its nascent stage (de Reuver & Ondrus, 2017; de Reuver et al., 2018), but their popularity is increasing (Benitez et al., 2022; Cenamor et al., 2019; Chen et al., 2022). To advance this research stream and to further deepen the understanding of digital platforms, this study investigates the DPC model from the perspective of a dynamic capabilities view, as presented in Fig. 1.

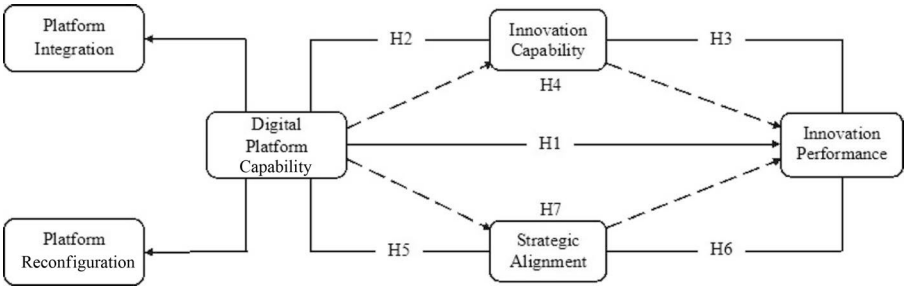


**Fig. 1** The conceptual framework and hypotheses
Note. The dotted lines represent the mediating effect between constructs

## Digital platform capability

Recent strategy and management literature reveal the interchangeable use of terms such as digitization, digital transformation, and digitalization, the latter being the most common. This is an emerging frontier of knowledge and a hot topic of interest among practitioners and academic scholars (e.g., Benitez et al., 2022; Chen et al., 2022; Guandalini, 2022; Yin & Yu, 2022), all of whom refer to the application of digital structures as part of a process of moving towards digitalized business to generate value-creating opportunities (Gartner, 2021). Similarly, Hanelt et al. (2021) operationalize digitalization as the organizational upgradation prompted by the diffusion of digital technologies. The functionality of these technologies, based on ICT systems, enables users to swiftly formalize, store, and share a huge and diverse amount of information (Williams et al., 2009; Zhang & Tong, 2021). The application of these technological structures serves authenticity, speed, and accuracy, which enhances the decision-making quality (Gao & Sarwar, 2022); for example, in the recent Covid-19 crisis, China efficiently deployed these structures to trace and contain the virus (Sarwar et al., 2021). For years, researchers have studied digital information and communication technologies to enhance organizational performance by improving operational efficiency and customer orientation (Brynjolfsson & McAfee, 2014; Melville et al., 2004). More complicated technological systems are now emerging, regarded as the digital platform (Parker et al., 2016).

A digital platform is "the technological applications that integrate a set of electronic business processes and data facilitating these processes" (Weill & Ross, 2009). They equip companies to sense and seize value-creating opportunities by facilitating communications among users (Leong et al., 2019) and challenge the traditional business approaches by adding more technical aspects, such as smart devices, hardware, and software. These additional elements work to formulate a complementary system and coordinate organizational processes, both internally and with third parties (de Reuver et al., 2018; McIntyre & Srinivasan, 2017). They take the processes of collecting, analyzing, and interpreting data to the next level and put knowledge accumulation and sharing at the epicenter of business models (McAfee et al., 2012; Van Alstyne et al., 2016). Digital platforms are structures of critical detachable units and equivalent governance (Tiwana, 2014), which systematize and automate operational processes, consequently boosting the veracity of data, reducing costs, and improving quality (Weill & Ross, 2009). Platform providers can make information and resources accessible to all adopters while providing uniqueness for all users by installing complementary modules. Moreover, digital platforms are scalable and can evolve (Wareham et al., 2014), which means they can revolutionize data management and enable top management to closely monitor "what is changing in the external market," which enhances the dynamism and innovativeness of the company (Weill & Ross, 2009). This significantly underlines the importance of digital platforms (Van Alstyne et al., 2016).

The contextualization of digital platforms offers remarkable advantages, however, transformation to digital platforms is a complex and challenging process that can shake any organization to its core (Cenamor et al., 2017). It is a systematic process that requires the commitment of the organization (Mohd Salleh et al., 2017). An

effective and successful transformation process requires the establishment of related digital capabilities (Benitez et al., 2022; Hanseth & Modol, 2021), and establishing DPC is critical because the company can dispose information and communication technology-based resources, along with other organizational resources (Mikalef & Pateli, 2017). DPC facilitates knowledge management within and outside the organization, elevating its ability to proactively identify potential opportunities and capture them successfully (Helfat & Raubitschek, 2018). Similarly, it enables companies to leverage internal and external resources, enhancing their potential to efficiently adapt to changes in the market (Teece, 2018b). Further, DPC elevates the organization's competencies to systematically assimilate internal and external knowledge resources and efficiently apply these resources to avail new business prospects available in the external market. These systematic mechanisms of screening market serve dynamism and enhance organizational capacities to introduce new products, services, and processes. The understanding of the relationship of DPC and innovation performance is limited, especially in the Asia Pacific region. To fill this gap, our study analyzes the direct and indirect (strategic alignment and innovation capability) association between DPC and innovation performance in the context of Asia Pacific.

## Innovation in the Asia Pacific region

Generally, innovation means thinking out of the box to create a new idea or opportunity, which Levasseur et al. (2020) say can only be referred to as innovative if it is translated into economic value. Innovation is a multidimensional concept essential for corporate survival and success (Scuotto et al., 2022), and innovative companies have greater potential to exploit business opportunities and circumvent potential risks, thus serving dynamism, competitiveness, and performance (Baregheh et al., 2009; Stefan & Bengtsson, 2017). It also plays a crucial part in accomplishing long-term sustainable performance and competitiveness at the global level (Anand et al., 2021). Across the world, organizations are striving to improve innovation performance, but the demand for innovation is even more urgent and relevant among those operating in the Asia Pacific region (Chin et al., 2021) because, in this region, the technical, social, political, and economic factors are more severe and more likely to disrupt innovation, plus there is greater room for improvement in this region.

Recent research investigated the phenomenon of innovation based purely on local realities. For instance, Jain (2020) called *jugaad and jugalbandi* "the Indian way of doing things" to build innovation capabilities, and network capability is highlighted as a critical source of innovation capability in the Pakistani context (Sarwar, Khan, Yang, et al., 2021). Furthermore, guanxi (social capital) is considered a major force in driving innovativeness in China (Chen et al., 2021). Scuotto et al. (2022) identify innovation capabilities and strategies as a core source of responsible innovation in the Asia Pacific as they emphasize on acquiring and leveraging the latest technological systems and knowledge to provide unique products and services (Carney, 2008). Prior research acknowledges the critical part of the latest information and communication-based technological structures and knowledge management in facilitating innovation performance (e.g., Haaker et al., 2021). They explore various anteced-

ents which drive innovation performance home in the context of Asia Pacific, like the heterogeneity of the top management team and participative decision-making, which significantly foster innovation in Chinese companies (Su et al., 2022). Haaker et al. (2021) identify the Internet of Things (IoT) as a fundamental fount of business model innovation in Vietnam, while intellectual capital gained through dynamic capabilities influences innovation in Iranian pharmaceutical firms (Farzaneh et al., 2022). Alertness components, such as information detection and filtration, assembly and linking, and appraisal and estimation, are essential drivers that significantly elevate incremental innovation in Iranian enterprises (Levasseur et al., 2020). In this vein, the current study identifies DPC as a potential antecedent of innovation performance. We advance this research stream by empirically exploring the direct and indirect associations of DPC and innovation performance in the context of Pakistani manufacturing.

The manufacturing sector in Pakistan is a main contributor to the gross domestic product (GDP) of the country; according to Pakistan's economic survey (2019), it has contributed 13.5–13.8%, on average, to GDP over the past ten years, showing no significant progress, and comparing poorly to regional neighbors such as China (38%), India (17%), and Bangladesh (17%). Globally, Pakistan ranks 113th out of 126 innovative countries (Global Innovation Index, 2018), and one of the main reasons for this relatively poor performance is that the sector tends to follow the status quo approach, rather than accepting change. Moreover, the sector has to deal with other technological, human, and institutional factors that hinder its performance, so there is a greater need to identify and investigate the different prospects that may boost the efficiency and effectiveness of the manufacturing sector. Accordingly, Khan et al. (2022) highlight the issue of the limited in-depth understanding of the sector and stress investigating information technology and knowledge management opportunities that may boost the sector's innovation performance. Consistent with the study by Yin and Yu (2022), who report that the digital transformation of manufacturing companies enhances their innovation performance, our study affirms that building DPC enables companies to establish strategic agility and innovation capability, subsequently improving their innovation performance.

## Hypotheses development

### Digital platform capability and innovation performance

The revolution in information and communication technology has made digitalization a hot research area in strategic management. Initially, it was considered a technical problem, but is now regarded as part of the information system landscape (Di Vaio et al., 2021; Yoo et al., 2012) and has become the epicenter of innovation. Digitalization is the application of advanced digital technologies in the organization, a state-of-the-art form of which is the digital platform, a combination of compatible and interconnected technological systems that perform essential functions (de Reuver et al., 2018; Mikalef & Pateli, 2017). Digital platforms stimulate organizational strategies, operations, and systems (Benitez et al., 2022; Sambamurthy et al., 2003), which poten-

tially amplify organizations' transformation capabilities. Classic literature suggests that organizational innovation performance greatly depends on knowledge sharing (Nonaka, 1994; Teece et al., 1997), an argument supported by more recent research (Castaneda & Cuellar, 2020; Di Vaio et al., 2021; Farzaneh et al., 2022) that report a positive relationship between knowledge sharing and innovation performance. They assert that a quick flow of information efficiencies the coordination and communication between organizational hierarchies and external stakeholders, which augment the corporate integration and reconfiguration capability. In this context, building DPC is essential to activate innovativeness as it facilitates rapid knowledge flow between internal and external sources (Cenamor et al., 2019). Furthermore, digital platforms facilitate procedures to develop unique products and services through fast connectivity (Sedera et al., 2016), easy access and interlinking (McIntyre & Srinivasan, 2017), coordination (Di Vaio et al., 2021), user-friendliness (Nylén & Holmström, 2015), and diverse functionality (Yoo et al., 2012). These intrinsic characteristics of digital platforms assist organizations in applying resources and capabilities in a way that heightens their capacity to modify current procedures, introduce new processes, and develop superior products and services. Moreover, establishing DPC elevates organizational capabilities and the efficient deployment of resources to be more dynamic in a constantly changing business environment (Mikalef & Pateli, 2017), which may enhance their capability to innovate. On the bases of above discussion, we hypothesize that:

**Hypothesis 1** Digital platform capability (DPC) is positively associated with innovation performance.

### The mediating role of innovation capability

Innovation not only requires scarce and valuable resources, but also organizational capabilities to integrate and deploy them (Sarwar, Khan, Yang, et al., 2021). One of these capabilities and resources is innovation capability, the capacity to convert resources into unique products and services (Zhou et al., 2017), a crucial source of competitiveness and sustainable performance that depends on acquiring and sharing knowledge (Le & Lei, 2019), a compatible leadership style (AlNuaimi et al., 2021), and that has implications for digital technology (Donate et al., 2022). Le & Lei (2019) and Schiavone et al. (2021) identify information management and sharing as essential activities that are crucial antecedents of, and serve, innovation capability. There are calls for future enquiries to identify and investigate the technological and strategic factors that predict innovation capability. Consistent with Benitez et al. (2022), we affirm that digitalization in terms of DPC enhances innovation capability because it elevates their competencies of information resource acquisition and sharing (Di Vaio et al., 2021) and facilitates knowledge management between stakeholders, thereby enhancing their capacity to identify opportunities, resulting in improved innovation capability (Mikalef & Pateli, 2017). Moreover, it enhances communication and coordination between internal and external stakeholders through a rapid flow of information, allowing the organization to evolve faster (Wareham et al., 2014).

Most importantly, DPC delivers the capacity to integrate and align information and communication technology-based resources with other inner and outer resources (Mikalef & Pateli, 2017), which may enhance the transformation capability of a company. On the bases of above discussion, we hypothesize that:

**Hypothesis 2** Digital platform capability (DPC) is positively associated with innovation capability.

Innovation is the essential driver of economic growth and a critical promoter of certain facets of competitive edge and performance (Hogan & Coote, 2014; Magni et al., 2022). In order to be more innovative, organizations need to establish related capabilities (Donate et al., 2022). In this regard, consistent with Zhang and Merchant (2020), we affirm that enhancing innovation performance is only feasible if a company possesses the potential to innovate, known in the literature as innovation capability. It is a precious capacity that plays a critical role in achieving sustainable competitiveness (Rajapathirana & Hui, 2018). Innovation capability is the combination of techniques, abilities, and information that enables companies to efficiently utilize resources to create new and unique outcomes (Lawson & Samson, 2001; Romijn & Albaladejo, 2002), enhancing management's ability to formulate and implement dynamic strategies, thus shaping a compact innovation culture (Villaluz & Hechanova, 2019). Innovation culture is an integral part of organizational culture (Brettel & Cleven, 2011), which provides a suitable environment to routinize innovation strategies, resulting in enhanced innovation performance. The ability to efficiently utilize skills and resources (innovation capability) shapes values, beliefs, failure toleration behaviors, and programming minds in the organization (Schein, 2004), which influences the company's innovation performance. As reported by Büschgens et al. (2013), these are crucial factors to improve innovation performance. Thus, innovation capability is a core dynamic competency which enables organizations to initiatively adapt to changes in the exterior business environment and elevate their potential to transform processes to yield new and unique products and services. On the bases of above discussion, we hypothesize as:

**Hypothesis 3** Innovation capability is positively associated with innovation performance.

Digital platforms perform numerous functions and serve organizational scalability, and eventually success (de Reuver et al., 2018; Wareham et al., 2014). Prior researches acknowledge the critical role digital technologies play in fostering organizational capabilities in service of business goals (Guandalini, 2022; Nambisan et al., 2019). In this vein, we argue that establishing DPC magnifies the ability to systematically acquire knowledge from diverse sources and efficiently deploy it to enhance their capacity to innovate, ultimately fostering their innovation performance. This assumption is purely founded on the conviction that DPC facilitates knowledge acquisition and sharing (Cenamor et al., 2019), which, according to Le and Lei (2019), is the antecedent of innovation capability. Accordingly, DPC reduces knowledge asymmetries by speeding up the knowledge flow within and outside the organization (Di Vaio

et al., 2021), which serves as a fundamental source of innovation capability (Le & Lei, 2018). Moreover, developing DPC assists leadership in performing their functions effectively and enables them to make data-driven decisions (Giotopoulos et al., 2017), which are the essential determinants of innovation capability (Mendoza-Silva, 2020), may enhance overall innovation performance. On the bases of above discussion, we affirm that DPC, by facilitating knowledge management and decision-making processes, elevates the capability to innovate, encourages innovative behaviors, values, and beliefs in the organization, ultimately enhancing innovation performance. Thus, we hypothesize as follows;

**Hypothesis 4** Innovation capability will mediate the association of digital platform capability (DPC) and innovation performance.

### The mediating role of strategic alignment

It is a dynamic and ongoing process of forming a strategic array of organizational strategies and administrative structures to outperform the competition (Burn, 1993). The strategic alignment notion is derived from the "Strategic-Alignment-Model" (SAM) which stresses achieving a suitable fit between the strategies of information technology and business, infrastructure of information technology and processes, and infrastructure of organization and processes (Henderson & Venkatraman, 1989). It is regarded as the alignment and harmonization between the organization's information system strategies and business strategies (Panda, 2021), which is crucial to improving performance, innovation, and competitive edge (Ilmudeen et al., 2019; Nassani & Aldakhil, 2021). Its growing importance compels top management to prioritize strategic alignment as it fill-up the void between information system strategies and business strategies (Henderson & Venkatraman, 1989; Pearlson et al., 2019) highlight the significance of realizing strategic alignment and regard it as the extent to which the vision, mission, plans, goals, and objectives of an organization are facilitated by its information system strategy, which enable the organization to create business value (Felipe et al., 2020). Shao (2019) finds that strategic alignment is the synchronization of information system functions with organizational processes, achieved through the establishment of information technology-enabled dynamic capabilities. In this context, we present DPC as an essential antecedent of strategic alignment because its role is no longer limited to information technology functions, and has rather become an important component of strategic management processes (Yeow et al., 2018). DPC may serve as an antecedent of strategic alignment because it facilitates the acquisition of knowledge resources, information sharing, knowledge management processes, coordination, communication, and decision making processes (Bag et al., 2021; Di Vaio et al., 2021; Giotopoulos et al., 2017), which enable top management to manifest strategic alignment. Furthermore, DPC integrates and harmonizes internal competencies and resources with the external business environment (Helfat & Campo-Rembado, 2016), which enables companies to adapt to change and devise complimentary strategies. On the bases of above discussion, we hypothesize that:

**Hypothesis 5** Digital platform capability (DPC) is positively associated with strategic alignment.

Strategic alignment achieves the best strategic fit of processes, systems, resources, and capabilities (Joshi et al., 2003), and should therefore be a primary concern of top management (Wu et al., 2015), due to its role in facilitating corporate performance (Majhi et al., 2021; Panda, 2021), creating business value (Felipe et al., 2020), improving operational performance (McCardle et al., 2019), innovativeness (Chau et al., 2020; Nassani & Aldakhil, 2021), sustainable development (Ling, 2019), and systems assimilation (Shao, 2019). Strategic alignment is an extensively studied phenomenon, but because of its critically pivotal role in aligning, optimizing, and achieving business vision, mission, and goals, there is an urgent need to explore the phenomenon further. It harmonizes business strategies with information system strategies, elevating the capability to transform processes (Ilmudeen et al., 2019), and operationalizing strategic alignment enhances corporate decision-making (Pearlson et al., 2019), which improves their capacity to adapt to fluctuations in the external market environment, thus facilitating innovation (Chau et al., 2020) Nassani and Aldakhil (2021) find that strategic alignment shapes organizational structures to facilitate creativity, unique ideas, and approaches, while Shao (2019) argues that every business strategy entails a specific information system strategy to achieve the intended outcomes, and an alteration in business strategy also calls for an alteration in information system strategy. Thus, it is a continuous process of aligning information system processes with business processes to ensure excellent performance (McCardle et al., 2019; Sabherwal & Chan, 2001). Moreover, Zhou et al. (2018) report that strategic alignment boosts organizations' agility, which enables them to adapt processes according to fluctuations in the outer market environment. Similarly, Kearns and Lederer (2003) find that strategic alignment ensures competitive advantage by optimizing costs and developing unique and competitive products and services. On the bases of above discussion, we hypothesize as follows;

**Hypothesis 6** Strategic alignment is positively associated with innovation performance.

The technological revolution brings waves of disruption across various industries, changing the nature of competitive dynamics and resulting in a number of new business models. To navigate the effects of these disruptions and their aftershocks, Sia et al. (2021) find that businesses are adopting digital transformation, investing billions of dollars in the process, but a very small percentage of them are successful and go on to reap the intended outcomes. Cenamor et al. (2019) and Yunis et al. (2018) also report that reaping the intended outcomes from digital transformation in terms of adopting digital platforms requires other related capabilities.

This study argues that leveraging DPC greatly depends on the extent to which the strategies of information systems are aligned and with business strategies (strategic alignment), a pivotal concept in the field of strategy and management that is critical in ensuring that all the facets of DPC and innovation performance are unidirectional and complimentary. Strategic alignment is a capability that enables companies to perform

in a dynamic and continuously evolving business environment (Chau et al., 2020) and includes knowledge and information resources (Nassani & Aldakhil, 2021), the acquisition and sharing of which are facilitated by DPC and help improve innovation performance (Benitez et al., 2022). We therefore assume that strategic alignment is an essential bridge between DPC and innovation performance because DPC improves strategic alignment by integrating internal capabilities and resources with external ones, which consequently may enhance innovation performance (Benitez et al., 2022). Furthermore, DPC is a vital source of information that facilitates decision-making processes and helps top management to align business strategies with information systems strategies, thereby enhancing innovativeness (Sabherwal & Chan, 2001). Moreover, strategic alignment creates inter-dependencies between information systems and business strategies, which means an alteration in either strategy demands an alteration in the other (Shao, 2019). Enabling strategic alignment is an ongoing process of changing business and information systems strategies according to changes in the external business environment (Shao et al., 2017), which may facilitate organizational efforts to enhance innovation performance. Hence, the study hypothesizes as follows:

**Hypothesis 7** Strategic alignment will mediate the association of digital platform capability (DPC) and innovation performance.

## Research methodology

### Methods and variables

To test the study's proposed model, we devised a self-administered survey instrument (questionnaire). We adopted a survey-based approach because it enables the simultaneous probing of a number of variables and serves generalizability and replicability (Straub et al., 2004). The questionnaire consists of 22 scale-items covering DPC, innovation capability, strategic alignment, and innovation performance. DPC is a higher-order construct comprised of platform integration and platform reconfiguration, each with four scale-items, while innovation performance, innovation capability, and strategic alignment have six, five, and three scale-items, respectively. To improve the redundancy and sanctity, the study uses a 7-point Likert-scale ranging from strongly disagree (1) to strongly agree (7). A pre-test assessment was conducted, garnering 15 responses, to ensure the content validity and that the respondents understood the survey questions, as intended.

### Measurement of variables

The complete details of all constructs' scale-items are provided in Table 1, briefly discussed as;

**Table 1** Measurement model assessment

| Code | Items Statements | F. L | VIF | α | CR | AVE | HTMT |
|---|---|---|---|---|---|---|---|
| **Digital Platform Capability (DPC)** | | | | | | | |
| | **Platform integration (PI)** | | | 0.846 | 0.897 | 0.685 | YES |
| PI1 | Our platform easily accesses data from our partners' IT systems | 0.876 | 2.456 | | | | |
| PI2 | Our platform provides a seamless connection between our partners' IT systems and our IT systems (e.g., forecasting, production, manufacturing, shipment, etc.) | 0.843 | 2.178 | | | | |
| PI3 | Our platform has the capability to exchange real-time information with our partners | 0.771 | 1.585 | | | | |
| PI4 | Our platform easily aggregates relevant information from our partners' databases (e.g., operating information, business customer performance, cost information, etc.) | 0.817 | 1.812 | | | | |
| | **Platform reconfiguration (PR)** | | | 0.806 | 0.872 | 0.631 | YES |
| PR1 | Our platform is easily adapted to include new partners | 0.804 | 1.849 | | | | |
| PR2 | Our platform can be easily extended to accommodate new IT applications or functions | 0.810 | 1.780 | | | | |
| PR3 | Our platform employs standards that are accepted by most current and potential partners | 0.801 | 1.534 | | | | |
| PR4 | Our platform consists of modular software components, most of which can be reused in other business applications | 0.761 | 1.511 | | | | |
| **Innovation performance (IP)** | | | | 0.874 | 0.905 | 0.617 | YES |
| IP1 | Our firm is good at renewing the administrative system and the mindset in line with the firm's environment | 0.794 | 1.960 | | | | |
| IP2 | Different types of Innovations are introduced for work processes and methods in our firm | 0.782 | 1.907 | | | | |
| IP3 | Our firm is good at improving the quality of new products and services introduced | 0.826 | 2.259 | | | | |
| IP4 | Our firm introduces a number of new product and service projects. | 0.852 | 2.596 | | | | |
| IP5 | A good percentage of new products in the existing product portfolio are introduced in our firm | 0.847 | 2.721 | | | | |
| IP6 | A good number of innovations under intellectual property protection are observed in our firm | 0.580 | 1.471 | | | | |
| **Innovation capability (IC)** | | | | 0.855 | 0.896 | 0.632 | YES |
| IC1 | Our firm has an organizational culture that promotes innovation. | 0.764 | 1.914 | | | | |
| IC2 | Our firm is able to use knowledge from various sources to develop products efficiently and rapidly. | 0.813 | 2.614 | | | | |
| IC3 | Our firm is able to identify changes in the market and rapidly apply them to its own products and processes. | 0.784 | 2.158 | | | | |
| IC4 | The employees in our firm are able to contribute to activities such as product development, improving the innovation process and developing new ideas. | 0.815 | 2.245 | | | | |

**Table 1** (continued)

| Code | Items Statements | F. L | VIF | α | CR | AVE | HTMT |
|---|---|---|---|---|---|---|---|
| IC5 | Our firm is able to evaluate new ideas from customers, suppliers, etc. and take them into account in product development. | 0.798 | 2.029 | | | | |
| **Strategic alignment (SA)** | | | | 0.837 | 0.901 | 0.752 | YES |
| SA1 | The information system (IS) strategy is congruent with the corporate business strategy in our organization | 0.876 | 1.765 | | | | |
| SA2 | Decisions in IS planning are tightly linked to the organization's strategic plan | 0.854 | 2.119 | | | | |
| SA3 | Our business strategy and IS strategy are closely aligned | 0.871 | 2.119 | | | | |

Note. F.L: Factor loadings; α: Cronbach's alpha; CR: Composite reliability; AVE: Average variance extracted; HTMT: Heterotrait-Monotrait ratio; VIF: Variance inflation factor; VIF values of all item statements are within the threshold of 3.3

### Innovation performance

Six scale-items measure innovation performance, adapted from Gunday et al. (2011). One example of a scale-item is, "Different types of innovations are introduced for work processes and methods in our firm."

## Digital platform capability (DPC)

DPC is a higher-order variable comprised of two sub-constructs, i.e., platform integration and platform reconfiguration, with four scale-items each. An example of a platform integration scale-item is, "Our platform easily accesses data from our partner's information technology systems" while a scale-item of platform reconfiguration is, "Our platform employs standards that are accepted by most current and potential partners." The study adopts the DPC section of the questionnaire from Cenamor et al. (2019).

### Innovation capability

Five scale-items were used to measure innovation capability, adapted from the study conducted by Monferrer et al. (2015). An example of a scale-item is, "Our firm has an organizational culture that promotes innovation."

### Strategic alignment

Strategic alignment is a first-order construct that comprises of three scale-items and is adapted from Shao (2019). An example of a scale-item is "Decisions in information system planning are tightly linked to the organization's strategic plan."

### Sample and data collection

The major objective of the study is to test the direct and indirect (strategic alignment and innovation capability) relationship between DPC and innovation performance. This research assesses the conceptual model through feedback collected from the manufacturing sector of Pakistan, which was selected for three reasons: first, the manufacturing enterprises furnish 13.5–13.8% to the total GDP of the country (Finance, 2020; Gao & Sarwar, 2022); second, the sector produces tangible products and therefore has prominent innovation processes; third, it employs 13.8% of the working population of Pakistan (Gao & Sarwar, 2022; Javed & Suleri, 2019).

To start the data collection process, information about the targeted respondents was obtained from professional forums, online dictionaries, and personal contacts. The questionnaires were distributed to top and middle-level management via physical visits, post, and email, as this population has sufficient information about their company's operations and strategies. The data collection process was completed in two stages. In stage 1, the survey instrument questionnaires were handed out, together with a cover letter that explains the main purpose of the study, their voluntary participation, and guarantees confidentiality. In stage 2, the completed questionnaires were collected by hand, by visiting the manufacturing facility. After two reminders via phone, we received 155 responses, a 20% response rate. Two extreme responses were excluded, leaving 153 valid responses to be included in the final analyses.

It is critical to receive an appropriate and sufficient number of responses to properly test our proposed model, to achieve our main objective, and to ensure the applicability of the study. Barclay et al. (1995) suggested the ten-times rule, according to which the minimum response is 40 because it has four latent variables; we comfortably exceeded this number, as well as the twenty-times rule suggested by Kline (2015). Hair Jr et al. (2016) also suggested the ten-times rule for analyzing the data using partial least squares-structural equation modeling (PLS-SEM) approach.

### Analytical Tools and Techniques

The Smart-PLS, version 3.3.2, was employed to analyze the collected data. A variance-based PLS-SEM method was used for various reasons. First, PLS-SEM is more appropriate method for analyzing a second-order construct (Sarstedt et al., 2016). Second, the proposed model is comprised of both direct and indirect relationships, and the literature supports PLS-SEM for this kind of model (Henseler & Christian, 2009; Sarwar, Khan, Yang, et al., 2021). Third, the sample size surpasses the lower-band requirement proposed by Hair Jr et al. (2016). Finally, for reliability and validity analysis, PLS-SEM offers more advanced techniques (Richter et al., 2016), and similar researches suggest the use of PLS-SEM (Farzaneh et al., 2022; Sarwar, Khan, Yang, et al., 2021).

In summary, the PLS-SEM approach is deemed suitable to test the proposed model. Following Gao and Sarwar (2022), we carried out the analysis in two stages: a measurement model assessment, and then a structural model assessment, following Hair et al. (2019). Prior to moving toward these stages, we screened the data for

any potential discrepancies and common-method biasness, as discussed in the next section.

### Data screening and common-method bias assessment

The data were thoroughly screened for possible discrepancies such as missing values, response biasness, outliers, and errors. A few missing values were found and dealt with using the "replacing missing values with means" function of Smart-PLS and, as mentioned previously, two extreme responses were excluded, leaving 153 valid responses for inclusion in the analyses.

We then censored the data for common method biases and made various arrangements to avoid compromising the applicability of the results. First, we used the "procedural remedies" developed by Podsakoff et al. (2012) to decrease the possible effect of common-method variance at the data collection stage. This includes collecting data at two different time frames (total six months duration with a one-month temporal separation), two different methods for data collection (postal and physical visit), response anonymity, clear and brief statements, and a pilot study. We also used the "statistical remedies," recommended by the same author, to assess the possible presence of common-method variance. A Harman's (1976) single-factor test was carried out (principle component analysis at an extraction value of 1 and non-rotation); the results show that 38.45% lie within the threshold of 50%. Further, a collinearity assessment was performed which, according to Kock (2015), is the most reliable technique for analyzing common-method biasness. The results from Smart-PLS's variance inflation factor (VIF) fall within the threshold of 3.3, as directed by Hair et al. (2019), and the VIF readings of constructs' indicators are presented in Table 1. Additionally, we assess the non-response bias by employing the extrapolation method, specifically by routing IBM SPSS's 25 functions of "an independent-sample t-test". The outcomes depict no substantial (0.05 level) difference between the two groups' mean values (35 early respondents and 35 late respondents). After ensuring that common-method and non-response bias do not contaminate the collected data, we moved towards the measurement model assessment stage, as suggested by Gao and Sarwar (2022) and Hair et al. (2019).

## Measurement model assessment

According to Hair et al. (2019), this assessment incorporates content validity, convergent validity, and discriminant validity.

### Content validity

We ensure content validity via indicators factor loadings, as suggested by Chin et al. (2010) and Hair et al. (2019). Loadings of all indicators were above the threshold of 0.50, meaning that the constructs elucidate at least 50% of the indicators' variance (Hair Jr, et al., 2021). Table 1 presents the details.

**Table 2** Discriminant validity (Fornell and Larcker criterion)

Note. Bold values at the diagonal are the square root of the latent constructs average variance extracted (AVE). Off diagonal values are correlations among latent constructs

| Latent Construct | PI | PR | IC | SA | IP |
|---|---|---|---|---|---|
| Platform integration PI | **0.828** | | | | |
| Platform reconfiguration PR | 0.563 | **0.794** | | | |
| Innovation capability IC | 0.478 | 0.526 | **0.795** | | |
| Strategic alignment SA | 0.374 | 0.43 | 0.712 | **0.867** | |
| Innovation performance IP | 0.446 | 0.552 | 0.644 | 0.552 | **0.786** |

**Table 2.1** Discriminant validity (HTMT)

Note. Latent constructs' HTMT values are within the threshold of 0.85.

| Latent Construct | PI | PR | IC | SA | IP |
|---|---|---|---|---|---|
| Platform integration PI | | | | | |
| Platform reconfiguration PR | 0.682 | | | | |
| Innovation capability IC | 0.556 | 0.615 | | | |
| Strategic alignment SA | 0.428 | 0.51 | 0.817 | | |
| Innovation performance IP | 0.502 | 0.633 | 0.733 | 0.608 | |

## Convergent validity

We used Cronbach's alpha (α), composite reliability (CR), and average variance extracted (AVE) to ascertain the consistency and convergent validity of the constructs. The accepted lower-bound threshold for α and CR is 0.7, as suggested by Cohen (2013) and Hair et al. (2019), and we find α and CR values ranging from 0.806 to 0.874 and 0.872–0.905, respectively, confirming that constructs the have sufficient mutual consistency. Similarly, the AVE readings range from 0.617 to 0.752, above the accepted threshold of 0.5 (Bagozzi & Yi, 1988; Hair et al. Jr, 2021), thereby confirming that the constructs possess satisfactory convergent validity. The detailed results of α, CR, and AVE are presented in Table 1.

## Discriminant validity (DV)

The term DV means the extent to which the constructs differ from one another (Fornell & Larcker, 1981). We measured the constructs' DV via the Fornell and Larcker criterion and the heterotrait-monotrait (HTMT) ratio. The detailed values of the Fornell and Larcker criterion are provided in Table 2. Each bold value is the square root of a construct AVE, and below these are the correlations with remaining constructs. Following Fornell and Larcker (1981), bold values higher than correlations means that the constructs are distinct from each other. Additionally, we used HTMT to safeguard the constructs' DV since, according to Henseler et al. (2015), it is a more suitable and advanced technique to ensure DV. The HTMT values fall within the upper-bound limit of 0.85 recommended by Hair et al. (2019) and Hair Jr et al. (2021). The detailed HTMT outcomes are provided in Table 2.1. The outcomes of the Fornell and Larcker criterion and HTMT show that DV is not a problem for this study.

After ensuring the data's reliability and validity in the measurement model assessment, we then move on to the structural model assessment stage, as suggested by Hair et al. (2019).

**Table 3** Model fit assessment

| Constructs | AVE | $R^2$ | $Q^2$ | Status |
|---|---|---|---|---|
| Platform Integration PI | 0.685 | | | |
| Platform Reconfiguration PR | 0.631 | | | |
| Innovation Performance IP | 0.617 | 0.483 | 0.288 | |
| Innovation Capability IC | 0.632 | 0.318 | 0.193 | |
| Strategic Alignment SA | 0.752 | 0.203 | 0.143 | |
| Avg of AVE & $R^2$ | 0.663*0.334 | | | |
| GoF = $\sqrt{(AVE \times R^2)}$ | 0.47 | | | Large |

Note. Adjusted $R^2$ values are given in the table

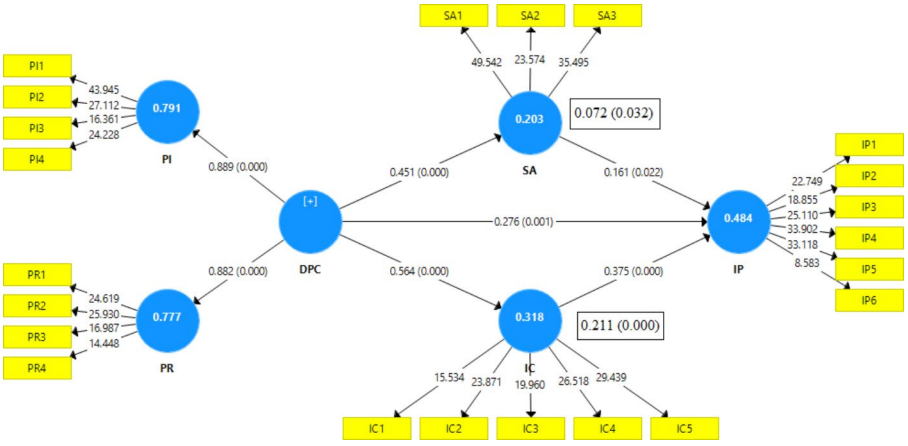


**Fig. 2** Structural model assessment
Note. DPC: Digital platform capability; PI: Platform integration; PR: Platform reconfiguration; SA: Strategic alignment; IC: Innovation capability; IP: Innovation performance; Inside parentheses are p-values; Outside parentheses are the path coefficient; Inside rectangles are mediation assessment outcomes; Indicators t-values are in the outer model; Inside circles are $R^2$ values

## Structural model assessment

The Smart-PLS's bootstrapping at a sub-sample of 5,000 was routed to test the significance of the proposed model and hypotheses, as directed by Hair et al. (2019) and Hair Jr et al. (2021). The structural model was examined for explanatory power ($R^2$), predictive relevance ($Q^2$), and goodness of fit (GoF), and the detailed results are discussed under the heading of "Model fit assessment" and presented in Table 3. Furthermore, the path coefficient (β) of constructs, along with the p-values and t-values of scale-items, are presented in Fig. 2, while Table 4 contains a comprehensive hypotheses assessment.

The outcomes of the PLS-SEM show that DPC has a positive and significant influence on innovation performance (β = 0.276; t-value = 3.474; p-value = 0.001), thereby supporting H1. The value of adjusted $R^2$ is 0.484 depicts that DPC explains 48% of variance in innovation performance. The assessment outcomes also show that DPC has a positive and significant influence on both innovation capability and strategic alignment (β = 0.564; t-value = 8.768; p-value = 0.000) and (β = 0.451; t-value = 6.866; p-value = 0.000) respectively, which provides support for H2 and H5. Furthermore,

**Table 4** Hypotheses assessment

| Hypothesized Path | | β value | t-value | p-value | Results |
|---|---|---|---|---|---|
| Direct effects | | | | | |
| H1 | DPC →IP | 0.276 | 3.474 | 0.001 | Supported |
| H2 | DPC→IC | 0.564 | 8.768 | 0.000 | Supported |
| H3 | IC→IP | 0.375 | 4.562 | 0.000 | Supported |
| H5 | DPC→SA | 0.451 | 6.866 | 0.000 | Supported |
| H6 | SA→IP | 0.161 | 2.293 | 0.022 | Supported |
| **Mediation effect (Indirect)** | | | | | |
| H4 | DPC→IC→IP | 0.211 | 4.228 | 0.000 | Partial mediation |
| H7 | DPC→SA→IP | 0.072 | 2.144 | 0.032 | Partial mediation |

Note. DPC: Digital platform capability; IP: Innovation performance; IC: Innovation capability; SA: Strategic alignment

outcomes reveal that both innovation capability and strategic alignment have a positive effect on innovation performance (β=0.375; t-value=4.562; p-value=0.000) and (β=0.161; t-value=2.293; p-value=0.022) respectively, thereby supporting H3 and H6.

### Mediation assessment

We hypothesized that the association between DPC and innovation performance is indirect and mediated by innovation capability (H4) and strategic alignment (H7). The Smart-PLS provides results for indirect effects in the "specific indirect effects" tab. According to Preacher and Hayes (2008), to analyze the mediation effect, first the direct relationship among predictor and criterions must be analyzed, which is also recommended by Hair Jr et al. (2016). After analyzing the direct effect, which turns out to be the significant one, the mediating analysis revealed that both innovation capability (β=0.211; t-value=4.228; p-value=0.000) and strategic alignment (β=0.072; t-value=2.144; p-value=0.032), partially mediate the association between DPC and innovation performance, thereby providing support for H4 and H7. Details of the mediation analyses are provided in Table 4.

### Model fit assessment

Here, we discuss the proposed model $R^2$ (Shmueli & Koppius, 2011), $Q^2$ (Geisser, 1974; Stone, 1974), and GoF (Tenenhaus et al., 2005). The $R^2$ of the three endogenous variables, namely innovation performance, innovation capability, and strategic alignment, are 0.483, 0.318 and 0.203, respectively, ranging from weak to moderate as per the threshold recommended by Hair Jr et al. (2021), which means that the exogenous variable has adequate explanatory power for the endogenous variables. However, analyzing models based solely on $R^2$ is not a recommended tactic. Therefore, we calculate $Q^2$ to analyze the relevancy of the structural model. According to Chin (2010), a $Q^2$ value higher than zero shows that exogenous variables possess predictive relevance for endogenous variables. $Q^2$ values for innovation performance

(0.288), innovation capability (0.193) and strategic alignment (0.143) show that they possess satisfactory predictive relevance. Furthermore, we use GoF to assess the goodness of the proposed model. The GoF value of the model is 0.47, which is below the ceiling set by Wetzels et al. (2009). The outcomes of the model fit assessment are satisfactory and presented in Table 3.

## Discussions and conclusions

The go-to option for businesses looking to improve efficiency, performance, and competitiveness is to implement the latest digital technology, known as digitalization (Gartner, 2021; Hanelt et al., 2021). Recent research suggests it is a potential route to dynamism and success (Benitez et al., 2022; Chen et al., 2022; Di Vaio et al., 2021; Guandalini, 2022). Practitioners also consider digitalization as a potential prospect as 90% of companies are embracing digitalization in order to be *"future-ready"* (Sia et al., 2021). Digitalization has ushered in digital platforms in organizations including General Electric, eBay, Uber, and Airbnb. A digital platform is a structure of interconnected and detachable units (Cenamor et al., 2019), which, on the one hand, substantially decreases the barriers for companies to connect with different stakeholders and, on the other, can boost a company's ability to efficiently manage a growing number of diverse relationships at an unprecedented scale (McAfee et al., 2012). Digital platforms are an emerging research area that enhances the firm capacity to identify opportunities and achieve efficiency, competitiveness, and innovativeness (Castillo et al., 2021; Ferreira et al., 2019; Jacobides et al., 2018). There is an urgent need to explore digital platforms from different perspectives because, firstly, organizations are struggling to adopt digitalization (Sia et al., 2021); secondly, the understanding of digital platforms in the organizational setting is limited; thirdly, several organizations failed in their digitalization attempts (de Reuver et al., 2018; Frishammar et al., 2018); fourthly, the digital platform is a multifaceted structure of different interrelated elements (Tiwana, 2014); and finally, information and communication technology alone cannot generate benefits (Cenamor et al., 2019; Mikalef & Pateli, 2017), and other related dynamic capabilities are required, such as DPC (Helfat & Raubitschek, 2018; Teece, 2017). Hence, our study further expands the understanding of digital platforms by exploring the direct and indirect associations between DPC and innovation performance.

In the current volatile and ever-changing market environment, organizations are eyeing digital platforms to achieve operational efficiency and fortify organizational competencies. Developing digital platforms and related capabilities have become their strategic priority. Digital platforms assist management in effectively performing their functions and facilitate decision-making through information assimilation. They enable firms to enhance customer satisfaction and yield other intended outcomes. For instance, JD.com, Daraz.pk, and the Alibaba platforms make use of instant messaging to enable users to communicate promptly, enhancing their user experience. Similarly, the Android modular structure provides complementary autonomy in executing value-creating actions. Researchers intuitively argue that the application of digital technological structure enables companies to introduce unique products and

services (Chen et al., 2022). Yin and Yu, (2022) also support this viewpoint arguing that the implication of digital technology changes the fundamentals of product, process, and business model development. In this stream, we affirm that the implementation of digital technologies such as digital platforms enhances dynamism and innovativeness. In the current era of digitalization, firms' transformation capacity and performance are embedded in digital technology capabilities such as DPC. Thus, any firm wanting to drive innovation performance home must hone its DPC. The DPC plays a prominent role in satisfying organizations' quest for innovation (Benitez et al., 2022). The quest for innovation is even more urgent in companies operating in the Asia Pacific region, especially Pakistani firms, as the country is performing poorly on the Global Innovation Index, and the manufacturing sector is not performing to its full potential (Khan et al., 2022). Exploring how DPC influences organizational innovation performance in the Pakistani manufacturing sector is the core purpose of the study. To make this purpose feasible, we propose a model based on dynamic capability theory, through which we explore the relationship of DPC and innovation performance with the potential mediating roles of strategic alignment and innovation capability. We empirically validate the model by testing the seven hypotheses, based on responses collected from 153 Pakistani manufacturing firms. Our results supported all seven hypotheses, and detailed findings are provided in Table 4.

The empirical outcomes of the study support our claim that DPC exerts a substantial positive effect on innovation performance, thereby supporting H1. This result is crucial because organizations are looking for different internal and external routes to improving innovation capability, upon which their very survival, success, and competitive edge may depend. DPC boosts organizational innovation performance via rapid knowledge management. Moreover, findings support our claim that innovation capability mediates the association between DPC and innovation performance, thereby supporting hypotheses H2, H3, and H4.

The organization's ability to transform existing procedures and processes to develop a culture that motivates employees to think outside of the box ability heavily depends on its DPC and innovation capability. We empirically find that DPC fosters innovation capability, while innovation capability boosts the companies' actual innovation performance. Finally, the outcomes of the study support our claim that strategic alignment also mediates the association between DPC and innovation capability, thereby supporting hypotheses H5, H6, and H7.

The literature reports that digitalization serves unprecedented benefits, but the successful application of digital technology requires organizational capability. Accordingly, a substantial number of organizations suffer a failure in their digitalization efforts because the information system and business strategies (vision, mission, goals, and objectives) of the organization are not aligned and complementary. Strategic alignment is critical for organizational success because it brings harmony between the organizations' information systems strategies and business strategies. Through mutual support, these strategies not only facilitate the organization's digitalization efforts but also enhance its innovation performance. These outcomes present significant theoretical implications.

### Theoretical contributions

Digitalization is an evolving research stream in the fields of strategy and management, attracting significant attention from researchers and practitioners, and its growing importance inspires researchers to investigate it from different perspectives and contexts. For instance, digital leadership through platform digitalization has been found to enhance innovation in European firms (Benitez et al., 2022). In Swedish enterprises, digitalization improves network capabilities, which subsequently improves performance (Cenamor et al., 2019). Ardito et al. (2021) find that digitization serves innovation processes in American enterprises, while Ferreira et al. (2019), Jin and Hurd (2018), and Schiavone et al. (2021) explore digitalization in the Portuguese, New Zealand, and Italian contexts, respectively. However, the understanding of digitalization in terms of DPC in the Asia Pacific region is limited, yet the demand for it is urgent as economies have realized its potential in creating value for organizations. The present investigation fills this void in the literature and advances the current understanding by exploring the study's proposed model in the Asian context. Along with this critical theoretical contribution, the study possesses the subsequent four significant contributions to the literature on strategy and management.

*First*, prior research employs the resource-based view (RBV) lens to study the implications of digital platforms in the organizational context (Ardito et al., 2021; Li et al., 2016; Sedera et al., 2016). However, we use the lens of the dynamic capability view to study the direct and indirect association between DPC and innovation performance, since RBV does not provide a complete explanation for the contemporary and continuously changing environment because it only focuses on heterogeneous resource advantage. Conversely, the dynamic capability view emphasizes dynamism and competitive edge emerging from the rapidly changing business environment. While RBV focuses on resource acquisition and provides insufficient details about the deployment of these resources, the dynamic capability view stresses the acquisition of resources and establishing capabilities to efficiently deploy these resources to achieve competitiveness (Teece et al., 1997). Hence, the study advances the understanding on the dynamic capability view (Helfat & Raubitschek, 2018; Teece, 2017, 2018b; Teece et al., 1997) by hypothesizing the relationships among constructs (DPC, innovation capability, strategic alignment, and innovation performance) through this lens. Our outcomes confirm that DPC amplifies organizational capabilities, which boosts firms' innovation performance.

*Second*, our study advances the research on digital platforms (Benitez et al., 2022; Cenamor et al., 2019; de Reuver et al., 2018; Panico & Cennamo, 2020) by exploring the unexplored relationship of DPC and innovation performance. DPC is a critical resources deployment capability that facilitates organizational efforts to identify, acquire, and share information on a large scale. Previous studies linked it with financial performance, user identification, peer production platforms, and a two-sided markets (Aryan et al., 2020; Cenamor et al., 2019; Somoza Sánchez et al., 2018; Trabucchi & Buganza, 2020). Moreover, prior research focuses heavily on product innovation (Nylén & Holmström, 2015; Yin & Yu, 2022; Yu et al., 2014) and tends to over-look overall innovation performance, which Gunday et al. (2011) find is the antecedent of corporate performance. Previous research also tends to focus on the

external perspective (network value) in terms of value creation (McIntyre & Srinivasan, 2017) and pays less attention to the internal core competencies (Gawer, 2014). DPC integrates both external and internal perspectives to facilitate the processes of knowledge sharing and opportunity identification, which subsequently enhances organizational innovation. Hence, the study contributes to the literature by finding that DPC enhances innovation performance.

*Third*, McIntyre and Srinivasan (2017) argue that the indirect effect of digital platforms on organizational performance is a largely unexplored area. Parida et al. (2016) and Ravichandran (2018) also provide support for this concept by arguing that information and communication technology-based capacities need other organizational capabilities to produce benefits. We expand this stream of research by arguing that innovation capability is essential in facilitating the association between the determinant (DPC) and the consequence (innovation performance). Innovation capability facilitates organizational efforts to establish an environment that promotes innovative ideas, efforts, beliefs, and values that enhance innovation performance. Further, researchers intuitively argue that there is a close relationship between technological capability, innovation capability, and innovation performance (e.g., Yin & Yu, 2022). However, this argument lacks empirical evidence. This study expands the current understanding by finding empirical support for this assumption, demonstrating that innovation capability partially mediates the association between DPC and innovation performance.

*Fourth*, strategic alignment is another crucial prospect that facilitates the association between predictor and criterion. Adopting digitalization is a complex and costly process that organizations often fail to embrace (Cenamor et al., 2019). We argue that one critical cause for these failures is the lack of harmony among the information system strategies and the business vision, mission, goals, and objectives. The appropriate harmony between strategies, described as strategic alignment in the literature (McAdam et al., 2019; Nassani & Aldakhil, 2021; Panda, 2021), is essential to successfully adopting digitalization. Our results reveal that strategic alignment partially mediates the association between DPC and innovation performance. Testing the mediating (indirect) role of strategic alignment is the fourth significant theoretical contribution of the study.

## Managerial contributions

Operationalizing the latest digital technological structures in an organization is a complicated process that necessitates changes in the basic organizational structure, soothing employees' technology-related concerns, and developing related dynamic capabilities. Many organizations fail in their attempt at digitalization, raising crucial questions regarding effective digitalization in the minds of researchers, managers, and policymakers. In accordance with the theme of Makarius et al. (2020), we propose a framework that can guide managers and policymakers in successfully implementing digital technologies in their organizations. Effective contextualization of digital technological structures will create efficiencies in the strategic management processes and elevate corporate competencies to achieve the intended outcomes. Contingent on the strategic management literature, our proposed model will guide management in

adopting digital transformation and assimilating it to create value for organizations. Moreover, we recognize that organizations should strive to establish dynamic capabilities which boost the likelihood of a successful digital transformation. Specifically, the study presents significant implications for management, practitioners, and policymakers by offering better and clearer causal associations among DPC, innovation capability, and strategic alignment to achieve innovation performance.

Improving innovation performance is the key strategic objective of companies operating in today's super-competitive and continuously evolving market environment as it delivers dynamism, competitiveness, and performance. Globally, organizations prioritize innovation and work hard to improve innovation performance; for those in Asia Pacific countries, especially in countries like Pakistan, which are performing poorly on the Global Innovation Index, improving innovation performance is the primary concern of top management. Our outcomes are of substantial practical value for companies at the global (general) and Asia Pacific (specific) levels as they clarify that building DPC leads them towards improved innovation performance. There are three other significant practical implications.

*First*, consistent with the theme of Bahl et al. (2021), our outcomes clarify that managers need to establish suitable skills and organizational competencies, especially dynamic capabilities, to improve innovation. They need to emphasize systematizing knowledge identification, acquisition, absorption, integration, and learning and systematically utilize them to enhance the quality of their decision-making, thereby fostering innovation performance. In this regard, this study finds that DPC reduces knowledge asymmetries, improves knowledge management, and boosts the opportunistic behavior of companies, which subsequently improves innovation performance. The results clarify that successful adoption of digital platforms provides unprecedented benefits, such as improved innovation performance. *Second*, our findings also provide a clear view for managers and policymakers that DPC is critically important to improve the transformational ability of the organization (innovation capability), which improves and supports their efforts to develop inimitable products and services, enhancing innovation performance. *Finally*, since organizations are struggling to successfully adopt digitalization, these results offer a clear picture to managers and direct them to devise mutually supportive and complementary information systems and business strategies. The outcomes encourage management to build DPC, which provides the resources to devise strategically aligned strategies to help them to enhance innovation performance.

## Limitations and future research directions

Though the current study significantly advances the existing understanding on digitalization, it is not free from limitations, which may serve to open up future research prospects. We reviewed only the English language literature on endogenous and exogenous variables and drew relationships among them; future research may include studies in other languages, too. The study explores the influence of DPC on innovation performance, leaving several other digitalization elements yet to be explored. Moreover, we analyze the indirect (mediating) role of innovation capability and strategic alignment between DPC and innovation performance, and this leaves open

the possibility for future studies into other unexplored constructs and their role as mediators, to expand understanding. DPC is a complex structure that requires diverse resources, and it can be considered from different perspectives. Finally, this study is conducted only within the Pakistani manufacturing sector because it operates in a highly dynamic environment; a comparative cross-industry or cross-country study could be conducted to expand our horizons on this subject.

**Acknowledgements** We are thankful to the editor and anonymous reviewers for their precious guidance and constructive suggestions. The authors are grateful for the support provided by the National Natural Science Foundation of China (Grant No. 72274029 & 71774027); Liaoning Planning Office of Philosophy and Social Science (Grant No. L20AGL010); Liaoning BaiQianWan Talents Program; Liaoning Provincial Federation Social Science Circles (Grant No. 2022lslybkt-054). The authors highly acknowledge the precious time and valuable feedback of the respondents. Without their help and support, this study was not possible. The authors also would like to acknowledge the efforts of service desk representatives of companies in collecting the feedback.

## Declarations

**Conflict of interest** Authors of the study have no conflict of interest.

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