From Digital Platform Capabilities to Firm Performance:

A Mediation Approach Based on Firm Agility and Network Capabilities

Faouzi M. Ayadi, Imam Mohammad Ibn Saud Islamic University, Saudi Arabia*

https://orcid.org/0000-0002-8231-8519

Thamir H. Alaskar, Imam Mohammad Ibn Saud Islamic University, Saudi Arabia

https://orcid.org/0000-0002-5715-6693

Wassim J. Aloulou, Imam Mohammad Ibn Saud Islamic University, Saudi Arabia

Amin Khalil Alsadi, Imam Mohammad Ibn Saud Islamic University, Saudi Arabia

ABSTRACT

This study aims to explore the influence mechanism of digital platform capabilities (DPC) on firm performance (FP) through a parallel mediation model of firm agility (FA) and network capabilities (NC) in a specific context. Data for this study were collected from 422 randomly selected Saudi firms with survey questionnaires mainly in central, western, and eastern areas of Saudi Arabia and then analyzed using structural equation modeling. The results showed that there are significant relationships of DPC to FA and to NC. No direct and significant relationship was found between PDC and FP. Moreover, FA and NC fully play their mediating roles between DPC and FP. The study contributes to the literature on digitalization, capabilities, and performance by providing new insights from the Saudi context. It also contributes to the practice by providing managerial implications for Saudi managers. Based on empirical evidence, to the best of authors' knowledge, this is the first endeavor to link DPC and FP and provide a new perspective of its influence mechanism.

KEYWORDS

INTRODUCTION

To better cope with their challenging and changing environments, firms have used new technologies for more flexibility and efficiency (Ahmed et al., 2022). Firms can achieve more competitive, innovative, and organized performance through the efficient use of digital platforms as IT-enabled, competitive tools (Ayadi, 2022; Cenamor et al., 2019; Mikalef & Pateli, 2017; Sedera et al., 2016).

*Corresponding Author

The emergence and the proliferation of digital platforms have enabled firms to connect, interact, and exchange with their shakeholders (Fu et al., 2021). The global economy is becoming more and more platformized due to the increasing importance of digital platforms for firms and their activities, since digital platforms are a venue for value proposition creation, capture, and delivery (Acs et al., 2021; Aloulou, 2019b; De Reuver et al., 2018). Digital platforms are restructuring the global economy and disrupting existing organizations (Kenney & Zysman, 2015). Firms build their IT-enabled capabilities to adopt digital platforms. This provides infrastructure and tools (software, apps, etc.) for their stakeholders, mediates work for their human resources, facilitates the trade of physical and virtual goods, or transforms service industries (Kenney & Zysman, 2015).

Saudi Arabia, which is one of the G20 countries, has a well-developed IT infrastructure (Alaskar, 2023), and deep (digital) transformations are underway in line with the Saudi 2030 Vision launched in 2016 (Alaskar & Alsadi, 2023). The country's considerable achievements in digital transformation enabled it to make a remarkable progress according to global indicators (Saudi Vision 2030). Several digital platforms were built to make all government services available digitally for citizens and businesses. In the digital age, digital skills and capabilities are needed and have to be empowered to enhance countries' and firms' competitiveness (Mezghani et al., 2022).

Several studies have shifted their attention to digital technologies and their effects on performance outcomes according to the Resource Based View (RBV) and Dynamic Capabilities (DC) theories (Bhatti et al., 2022). Based on these theories, this study uses the main concepts of digital platform capabilities (DPC), firm agility (FA), network capability (NC), and DC to influence firm performance (FP). DPC has become an IT-enabled capability that is needed for firms to interact and exchange with their stakeholders. Drawn from an RBV perspective, IT is deemed to be a technological resource used in digital platforms. Moreover, based on a DC perspective, DPC is referred to as IT-enabled capability.

The literature on digital technologies suggested that DPC alone may not enhance firm performance directly but rather indirectly through dynamic capabilities such as FA and NC. Together, they are needed to adapt and change in the face of shifting market requirements and to navigate volatile, uncertain, complex, and ambiguous environments successfully (Bresciani et al., 2021; Teece et al., 1997; Troise et al., 2022). In this study, we are dealing with two types of DC: As an IT-enabled capability, DPC is a low-level dynamic capability; FA and NC are high-level dynamic capabilities (Bhatti et al., 2022; Felipe et al., 2020; Steininger et al., 2022).

To address this knowledge gap, we suggest that FA and NC mediate the relationship between DPC and FP. The purpose of this study is to examine the causal mechanisms through which IT-enabled DC can help sustain a higher firm performance level by allowing a firm to rapidly reposition itself when conditions require it.

In this study, we address the research gap and contribute to the literature on DPC, FA, NC, and FP in three ways. First, this paper seeks to access the links among DPC, FA, NC, and FP in the Saudi context, an emerging country with a fast-growing economy, robust digitalization strategy, and fairly developed digital infrastructure (Alaskar & Alsadi, 2023). Such research helps to increase understanding of the influence mechanisms of DPC in relation to other mediating and dependent variables when relying on a parallel mediation model and data collected from 422 Saudi firms. By examining these relationships, we hope our findings can be generalized to other emerging countries with economic and digital infrastructure similar to the Saudi context. Our paper fills this specific research gap. Second, through the RBV and DC perspectives, the paper focuses on the role of FA and CN as high DC enhanced by DPC as a low dynamic capability. This insight helps increase understanding of the mechanisms that link low to high DC. Third, the paper contributes to practice by providing empirical evidence on DC to raise awareness among top Saudi managers of how to build such capabilities to improve their performance levels.

The remainder of the paper is structured as follows. The subsequent section presents the theoretical background by introducing the main concepts of DPC, FA, NC, and FP from the perspectives of RBV and DC, and it details the proposed model through hypotheses development. In the third section,

the methodology used in this study and the strategy for the data analysis are introduced. The fourth section presents the findings of the study, and the fifth section discusses these findings and advances a number of theoretical and managerial implications. In the last section, the paper concludes with a summary of main results and a listing of certain limitations and directions for future research.

THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

Theoretical Background

Resource-Based View and Dynamic Capabilities

According to the RBV, the existing variation in organizational resources or assets among firms leads to differentiation in firms' performance and their competitive edge (Barney, 2001; Chae et al., 2014). The RBV has emerged as a popular and influential framework within the field of business research (Chae et al., 2014). Thus, it is widely acknowledged as a robust and firmly established theoretical framework for understanding the strategic behavior of firms (Alsadi et al., 2021). Moreover, it clarifies the mechanisms through which firms acquire and sustain a competitive edge by leveraging their resource endowments and control over resources. Therefore, this theory posits that a firm can be understood as comprising resources that are both intangible and tangible. This perspective further asserts that only resources that possess the characteristics of being valuable, rare, inimitable, and non-substitutable (VRIN) have the potential to generate a competitive edge (Alsadi et al., 2021; Barney, 2001). This is the case for DPC when it is considered as a core capability for firms that enables them to identify and use required resources and turn them into new resources and capabilities to gain competitive advantage and enhance their performance (Cenamor et al., 2019; Liu et al., 2023).

Furthermore, the theoretical concept of DC has been widely used to describe the varying performance of an organization within a dynamic context. This concept builds upon the RBV paradigm, which emphasizes an organization's capacity to adapt and modify its resources to achieve a competitive edge within a constantly changing business environment (Helfat & Peteraf, 2009; Teece et al., 1997). Khan & Tao (2022) mentioned that, while the DC view expands upon the RBV approach and maintains that DC connect a firm's resources with the evolving business environment (Barney, 2001), the DC view places more emphasis on the development and implementation of essential capabilities in contrast to the RBV to respond to external environmental shifts effectively.

Khalil et al. (2023) mentioned that the DC and the RBV theories diverge in their approach, with the latter placing more emphasis on leveraging resources and competencies to attain a competitive advantage within a static market. They further argue that the RBV hypothesis fails to provide a comprehensive explanation for the dynamic nature of comparative advantages and disadvantages. In this research, we examine the influence mechanism of these capabilities on performance using the RBV and DCV perspectives. However, many prior studies have used these theoretical frameworks to comprehend the intricacies associated with digital capabilities (Wamba et al., 2020), digital strategy (Yeow et al., 2018), digital supply chain (Rana et al., 2021), big data, digital business capability, digital platform, and network capabilities (Ahmed et al., 2022; Bhatti et al., 2022; Khan & Tao, 2022; Wielgos et al., 2021).

In this study, we also consider DPC as IT-enabled capabilities. These capabilities are deemed to be lower order capabilities, and FA and NC are supposed to be higher order capabilities following the perspective of Felipe et al. (2020). Extant literature (Bhatti et al., 2022; Felipe et al., 2020; Grant, 1996; Steininger et al., 2022) shows that there is a hierarchy for organizational capabilities, whereby lower order capabilities can be generated (e.g. DPC) and then integrated to generate higher order capabilities (e.g. FA or NC) which directly contribute to business outcomes. Our study contributes to this hierarchical perspective of the RBV theory and the DC extension by shedding light on how the foundational DPC (as lower-order IT-enabled capabilities) enable both FA and NC (as higher order IT-enabled capabilities) which consequently improve firms' performance.

Digital Platform Capabilities

The significance of DPC for organizations cannot be overstated. In today's rapidly evolving business landscape, DPC plays a pivotal role in shaping a company's competitiveness, innovation, and overall success (Khan & Tao, 2022; Sarwar et al., 2023; Sedera et al., 2016).

DPC refers to an organization's competence in utilizing cutting-edge digital tools and technologies as strategic assets to gain a competitive advantage (Ahmed et al., 2022; Cenamor et al., 2019). As avenues for constructing IT frameworks, digital platforms encompass social media, mobile computing, and e-commerce platforms, which have progressively extended firms' horizons and empowered them to form digital alliances with their collaborators. These platforms serve as strategic instruments and facilitators of dematerialization processes, contributing to significant cost savings and revenue augmentation (Esposito De Falco et al., 2017; Sedera et al., 2016).

DPC are crucial for effectively utilizing ICT-based resources and technologies, both within and beyond the organization's boundaries (Jun et al., 2022; Mikalef & Pateli, 2017). These capabilities enable enterprises to integrate critical shared knowledge seamlessly and reconfigure both internal and external resources adaptively to respond flexibly and quickly to dynamically-changing market needs (Jiang et al., 2023).

DPC empower businesses to harmonize strategic knowledge sources via digital technology, resulting in improved responsiveness to ever-changing environments (Cenamor et al., 2019). They encompass abilities in integrating platforms for knowledge and information exchange, as well as capabilities in reconfiguring platform resources by modular design and standardized interfaces in applications and processes (Bhatti et al., 2022; Ramdan & Abdullah, 2021). They also elevate the ability of the organisation to identify potential opportunities proactively and capture them successfully based on the integrated knowledge (Khan & Tao, 2022; Sarwar et al., 2023).

Firm Agility

Researchers have argued that organizational agility is the new management paradigm in which organizations are subjected to fluctuations in technology, customers, competitors, and climate (Khalil et al., 2023). From a qualitative analysis based on a conceptual map of organizational agility, Walter (2021) integrated insights from various research streams on organizational agility and developed an applicable definition and a concept that reflects the application of agility in an organization. In fact, FA is defined as an organizational capability, as is common in recent literature (Lu & Ramamurthy, 2011; Tallon & Pinsonneault; 2011). Based on the definition of FA advanced by Sambamurthy et al. (2003), several studies argued that FA is an ability to identify, react efficiently to, and take advantage of market opportunities (Ahmed et al., 2022; Chen & Siau, 2020). It refers to a firm's ability to utilize its current knowledge, adapt to abrupt business changes, and detect and enter niche markets to redefine its business opportunities (Khan & Tao, 2022). Thus, it refers also to a firm's ability to detect and respond to changes in the market with ease, speed, and dexterity (Khalil et al., 2023; Tallon & Pinsonneault, 2011). For instance, FA allows firms to reshape their business operations and their internal and external processes and provide prompt responses to market conditions in their supply chains with partners (Gligor et al., 2015; Lowry & Wilson, 2016; Lu & Ramamurthy, 2011; Melián-Alzola et al., 2020).

Network Capabilities

Network capabilities represent a major shift from traditional linear value chains to complex interconnected networks, thus they could be viewed as unique resources that create value (Akmalia & Astuti 2022; Cenamor et al., 2019; Karimi & Walter, 2015; McIntyre & Srinivasan, 2017). NC refer to the coordination of internal and external relationships, as well as the competencies and relational skills that facilitate knowledge transfer and enhance the social capital of employees and stakeholders (Battistella et al., 2017; Bhatti et al., 2022; Cenamor et al., 2019; Zacca et al., 2015).

Some scholars highlight the role of NC in exploiting existing ties and developing new ones to achieve a competitive advantage (Ediansyah et al., 2022; Gulati, 1998; Wegner et al., 2023). Others

emphasize the important roles of NC as strategic resources and dynamic capabilities that enable firms to access new and rare resources through alliances and social ties (Akmalia & Astuti, 2022; Parida et al., 2017). Based on the RBV perspective and its extensions, NC are vital resources and dynamic capabilities that can enhance value creation and improve FP.

Firm Performance

A large number of studies on the topics of DPC, FA, NC, and FP have used a multidimensional and board concept of performance, encompassing various aspects of competitiveness, operations, and management excellence and addressing the notion of performance over time (Aloulou, 2019a; Aloulou, 2023; Alsadi & Aloulou, 2021), as well as distinguishing between intermediate and final outcomes (Jiang et al., 2023; Jun et al., 2022; Khan & Tao, 2022; Liang et al., 2010; Mikalef & Pateli, 2017; Ramdan & Abdullah, 2021; Sarwar et al., 2023; Wielgos et al., 2021). The challenge of measuring FP as a unidimensional construct (Ashrafi et al., 2019; Bhatti et al., 2022) or a bi-dimensional construct (Khalil et al., 2023) still persists in the field of performance topic.

The question of how to measure FP also persists: objective vs. subjective measures. Since objective data on FP are difficult to obtain, subjective measurements have been considered a suitable alternative (Singh et al., 2016). In this study, we focus on a specific aspect of FP which is reflected in the level of satisfaction of top management with their firm's outcomes (returns on investments and sales and growth in sales, profit, and market share) and is influenced by their DPC and the firm's capabilities (FA and NC).

Hypotheses Development

Digital Platform Capabilities and Firm Agility

Past research has generally asserted that IT capabilities can enhance agility by speeding up decision making, facilitating communication, enabling quick responses to changing conditions, and building digital options (Sambamurthy et al., 2003). IT-enabled capabilities for assimilation and alignment have been previously linked to firm agility (Lowry & Wilson, 2016; Lu & Ramamurthy, 2011; Melián-Alzola et al., 2020; Tallon & Pinsonneault, 2011).

In recent years, the rise of platforms as the dominant IT infrastructure and digital business model has pushed firms to build capabilities on such platforms. Digital platforms have expanded the scope of possibilities beyond conventional business methods. Acquiring DPC is therefore imperative for firms to innovate, compete, succeed, and resist market disruptions (Khan & Tao, 2022).

Several studies argued that DPC can help firms to become more flexible and agile. These capabilities help them to acquire the necessary resources (e.g. information, data, etc.) for improving and innovating their products or services while integrating themselves into their supply chain partners (Ahmed et al., 2022; Khan & Tao, 2022). Likewise, enhancing agility in the organization is one of the benefits of DPC, which can aid in the sustenance of the organization in the market. DPC empowers firms to adapt promptly to changing market dynamics, customer preferences, and technological advancements. This allows them to seize new opportunities, mitigate risks, and stay ahead of the competition (Chen et al., 2014; Mikalef & Pateli, 2017). Therefore, DPC can contribute positively towards achieving higher FA.

Based on this, we suggest the following hypothesis:

H1: There is a positive relationship between DPC and Firm Agility.

Digital Platform Capabilities and Network Capabilities

Based on previous studies, DPC plays a vital role in boosting NC. DPC enables a firm to establish and maintain relationships with other firms using digital platforms, thereby facilitating growth at minimal costs and improving a firm's competitiveness, capacity for innovation, and overall success

(Akmalia & Astuti, 2022; Blaschke et al., 2018; Helfat & Raubitschek, 2018; Khan & Tao, 2022; Sarwar et al., 2023). Companies are using digital platforms, such as social media, mobile computing, and e-commerce, to enhance their internal and external communication, coordination, and information flows (Cenamor et al., 2019; Pietronudo et al., 2022). Furthermore, both the technical and social architecture of DPC enable companies to manage their evolving digital network of partners effectively (Cenamor et al., 2019; Jiang et al., 2023; Marion et al., 2015).

DPC as lower order dynamic capabilities aid in developing the NC of firms, which in turn enables them to gain access to various and rare resources. Previous literature suggests that firms with strong NC can enhance their external resources (Akmalia and Astuti, 2022; Parida et al., 2012; Parida et al. 2017), Based on the previous discussion, we hypothesize:

H2: There is a positive relationship between DPC and NC.

Firm Agility and Firm Performance

The literature on FA reveals that agility affects FP. In fact, it is generally argued that FA is beneficial for firms since it allows them to adapt and align their activities in a manner that helps to achieve superior financial performance (Chen et al., 2014; Sambamurthy et al., 2003). Several studies have reported that organizational agility positively influences FP (Chen et al., 2014). Further, Gligor et al. (2015) showed that agility impacts performance in various industries and environments. In the same vein, Ashrafi et al. (2019) considered that agility has a major impact on a firm's success. Several studies have proven the impact of agility and related attributes on business performance (Chakravarty et al., 2013) or innovation performance (Khan & Tao, 2022). Hence, agility can lead to improved performance by the optimization of a firm's range of responses to market changes and the reduction of risk and uncertainty due to (global) crises and outbreaks (Bai et al., 2023; Khalil et al., 2023; Tallon & Pinsonneault, 2011). As a result, firms that embrace agility can experience growth in market share, cost reduction, and higher revenue and profitability.

Therefore, the following hypothesis is proposed:

H3: There is a positive relationship between FA and FP.

Network Capabilities and Firm Performance

NC, as one of a firm's DC, provides strategic advantages that can improve FP. These capabilities establish and maintain interdependencies both within and outside the firm (Akmalia & Astuti, 2022; Cenamor et al., 2019; Gulati, 1998). This, in turn, will enhance the ability of a firm to respond to changing market needs and conditions (Acosta et al., 2018; Battistella et al., 2017; Cenamor et al., 2019; Parida et al., 2017).

Similarly, empirical research highlighted that NC boosts both internal and external knowledge sharing among the network partners, which enables firms to identify market challenges and trends and enhances the collaborative decision-making and response processes among partners, thus effectively improving FP (Akmalia & Astuti, 2022; Battistella et al., 2017; Cenamor et al., 2019; Ediansyah et al., 2022; Gonzalez & de Melo, 2018; Wang & Hu, 2017; Wegner et al., 2023).We hypothesize that:

H4: There is a positive relationship between NC and FP.

Digital Platform Capabilities and Firm Performance

There is a need to understand the impact of DPC on performance outcomes (Cenamor et al., 2019). This impact was discussed in the literature considering a firm's competitive advantage (Mikalef & Pateli, 2017), innovation (Sedera et al., 2016; Xiao et al., 2020), innovation performance (Jiang et

al., 2023; Jun et al., 2022; Khan & Tao, 2022; Sarwar et al., 2023), SMEs performance (Ramdan & Abdullah, 2021), and FP (Cenamor et al., 2019; Liu et al., 2023). For example, in their work, Cenamor et al. (2019) found a positive and direct relationship between DPC and FP using a regression analysis. Likewise, Liu et al. (2023) explored the influence mechanism of DPC on FP in the B2B context and found a positive impact on a B2B firm's performance.

The following hypothesis is then proposed:

H5: There is a positive relationship between DPC and FP.

Mediation Role of Firm Agility in the Digital Platform Capabilities–Firm Performance Relationship

FA can be considered an organizational capability (Lu and Ramamurthy, 2011; Tallon and Pinsonneault, 2011) and can play a key mediating role between DPC and FP. In a literature review on FA, it was found that FA can play a mediating role between IT capabilities or competencies and FP (Bai et al., 2023; Chakravarty et al., 2013). In the same line, Felipe et al. (2020) found a full mediation played by organizational agility between Information Systems capabilities and FP. Recent research has established that firms can improve their performance through firm agility that is leveraged by IT-enabled capabilities such as digital capabilities (Ahmed et al., 2022). We state that DPC will enable FA to enhance FP. In fact, DPC provide key mechanisms to leverage FA (Felipe et al., 2020; Sambamurthy et al., 2003).

According to Chen et al. (2014), IT-enabled capabilities can affect FP through the mediating role of FA as organizational capability. In fact, high levels of capabilities in digital platforms could enable firms to accelerate the execution of their business processes and respond flexibly and quickly to changing environments. These capabilities can provide mechanisms to enhance FP indicators such as profitability and growth. Mikalef & Pateli (2017) argued that IT-enabled DC on competitive performance is mediated by organizational agility in terms of market capitalizing and operational adjustment agility.

From what precedes, we can propose the following hypothesis:

H6: FA mediates the relationship between DPC and FP.

Mediation Role of Network Capabilities in the Digital Platform Capabilities-Firm Performance Relationship

NC as higher order capabilities can play a vital role as mediator between DPC and FP. Ultimately, these capabilities could reflect and convert the potential advantages of DPC into actual improvements in FP. Extant literature shows that DPC enable improved information sharing and interdependencies within and outside a firm, thus strengthening its NC. These capabilities in turn can enhance a firm's competitive advantage and performance (Bhatti et al., 2022; Cenamor et al., 2019; Ediansyah et al., 2022).

Digitally enabled NC also establish and maintain important business relationships among trade partners, allowing firms to better target customers, identify new opportunities, and act upon them based on integrated efforts and knowledge, thus sustaining the competitive advantage and improving their performance (Bhatti et al., 2022; Shu et al, 2018; Wegner et al., 2023). This clearly shows the possible mediating role of NC, as they can translate the benefits of DPC into FP improvements.

Despite the previously discussed possible mediating role of NC, the empirical examination of this role is still rare (Cenamor et al., 2019). The current research will improve our understanding of this possible mediating role of NC among firms in Saudi Arabia, the economy of which is in transition. Thus, we hypothesize:

H7: NC mediates the relationship between DPC and FP.

Research Model

Figure 1 illustrates the research model and hypotheses, suggesting the influence of DPC on FP through FA and NC.

METHODS

Sampling and Data Collection

Data were collected from May to June 2023 using an online Google form survey questionnaire. The link to the questionnaire was sent by email, through WhatsApp groups, and other social media. Participants to this study were mainly members of management (middle and senior) of Saudi firms operating in several sectors of activity. A total of 422 observations were collected. After screening and purifying data based on techniques described by Tabachnick & Fidell (2012), no redundant observations or observations with outliers were identified, and all 422 observations were accepted to run the model and test the research hypotheses.

Table 1 presents each firms' characteristics. More than 33% of the sample are from the IT sector. More than 15% are from the financial sector (banks, insurance, etc.), and with percentages less than 9%, other service sectors were presented in the sample (telecommunications, healthcare, etc.). Less than 5% are from manufacturing sectors (food processing, petro-chemical, electrical, and electronic sectors). More than 47% are firms from the private sector. More than 38% are from the public sector. The remaining 13.5% are from other sectors. In terms of age and size, 41.5% are firms older than 20 years and 29.9% are firms with over 3000 employees. 42.7% of the sample are firms with sale revenues larger than 200 million SAR. They are mostly located in the central area of Riyadh, the capital of Saudi Arabia.

Regarding the characteristics of the respondents (Table 2), the majority of them are male (84.1%), older than 40 years old (41.5%), and well-educated (87.7% have a bachelor or higher degree). 82.5% of the respondents have work experience of more than 5 years.
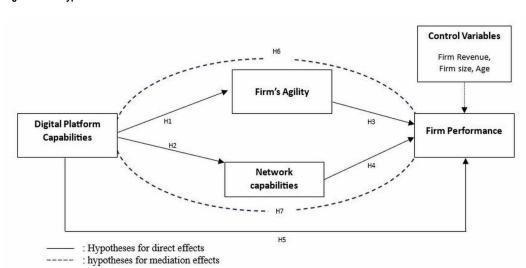
Figure 1. The hypothesized research model

Table 1. Firms' characteristics (N=422)

Firms' Characteristics	Frequency	%
Activity sector		
Information technology or artificial intelligence	140	33.2
Electrical & Electronics	20	4.7
Financial sector (banking, insurance, etc.)	65	15.4
Dairy, Food & Meat Products	22	5.2
Retail, Wholesale, Distribution	21	5.0
Automobile Dealership	11	2.6
Petro-chemical & Pharmaceuticals	16	3.8
Medical & Healthcare	28	6.6
Transportation, Logistics & Courier	17	4.0
Telecommunications	32	7.6
Power and renewable resources	11	2.6
Others (hospitality, education, real estate, entertainment, HR and manpower services…)	39	9.2
Ownership		
Public	164	38.9
Private	201	47.6
Joint venture	35	8.3
Foreign	17	4.0
Others	5	1.2
Age		
Less than 5 years	63	14.9
5- 10 years	89	21.1
11-15 years	52	12.3
16-20 years	43	10.2
More than 20 years	175	41.5
Size		
Less than 50 employees	67	15.9
Between 50 and 249 employees	93	22.0
Between 250 and 499 employees	65	15.4
Between 500 and 2999 employees	71	16.8
3000 employees and more	126	29.9
Firm Revenue		
Less than 3 million SAR	43	8.8
3-40 million SAR	33	6.8
40-200 million SAR	144	29.6
More than 200 million SAR	208	42.7
Localization		
Central	303	71.8
Northern	28	6.6
Western	28	6.6
Eastern	37	8.8
Southern	26	6.2

Table 2. Respondents' characteristics (N=422)

Respondents' Characteristics		
Gender		
Male	355	84.1
Female	67	15.9
Age		
Less than 25 years	63	14.9
26-30	89	21.1
31-35	52	12.3
36-40	43	10.2
More than 40 years	175	41.5
Academic Qualification		
High school diploma or less	21	5.0
Intermediate diploma	31	7.3
Bachelor	279	66.1
Postgraduate	91	21.6
Work experience		
Less than 5 years	74	17.5
Between 5 and 10 years	117	27.7
Between 10 and 15 years	103	24.4
Between 15 and 20 years	58	13.7
More than 20 years	70	16.6

Variables Measurement

In this study, DPC is used as an independent variable, FA and NC as mediators, and FP as dependent variable. All constructs used in this study were adapted from the literature and measured on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Digital Platform Capabilities

DPC was adapted from Cenamor et al. (2019) and Rai & Tang (2010) and is measured using eight items from Bhatti et al. (2022). Previous studies adopted similar items (Jiang et al., 2023; Sarwar et al., 2023). Two sample items are listed here: "Our platform easily accesses data from our partners' IT systems" and "Our platform is easily adapted to include new partners."

Firm Agility

FA was adapted from Tallon & Pinsonneault (2011), Ashrafi et al. (2019), and Khan & Tao (2022). It is measured using eight items. A sample item is: "Compared with your major competitors, how easily and quickly can your organization perform in the following activities: Respond to changes in aggregate consumer demand."

Network Capabilities

NC was adapted from Bhatti et al. (2022) and Cenamor et al. (2019). It is measured using 12 items. A sample item is: "In our company managers and employees often give feedback to each other."

Firm Performance

FP was adapted from Bhatti et al. (2022) and Felipe et al. (2020). It is measured using five items. A sample item is: "Compared with key competitors, our company has a better return on investment than our competitors."

A detailed list of the items related to the study constructs can be found in Appendix.

Control Variables

Three control variables concerned firm age, size, and revenues. Past studies recommended considering these variables as control variables (Ashrafi et al., 2019; Cenamor et al., 2019). Firm *age* refers to the number of years since the creation of the firm, firm *size* refers to the number of employees, and firm *revenues* refers to the number of sales realized last year in Saudi Riyals (1 SAR = 0.27 USD).

Strategy of Analysis

We used SPSS software (version 21.0) to conduct an exploratory factor analysis (EFA) to identify the underlying factors of the measurement items. Additionally, we used AMOS software (version 21.0) to conduct a confirmatory factor analysis (CFA) and validate the measures in our research context.

Afterwards, we performed an explanatory analysis using the maximum likelihood estimation (MLE) method with AMOS software to test our hypotheses (Hair et al., 2019; Hamdy et al., 2023). We found structural equation modeling (SEM) to be an appropriate method for analyzing both direct and indirect effects (Collier, 2020) and estimating all the relationships in the conceptual model simultaneously. To conduct the SEM analysis, we had a sufficient sample size of 422 observations.

Factorial Analysis, Reliability and Validity

In Appendix, the reliability and validity of the constructs are presented. The results of the exploratory factor analysis indicate that the factor loadings are not only significant but also higher than 0.5 (0.714–0.859). Furthermore, the KMO index exceeds 0.6, suggesting good sampling adequacy. The constructs exhibit high reliability, with Cronbach's Alphas exceeding 0.7. Additionally, the composite reliability (CR) indexes surpass 0.912, further confirming the reliability of the constructs. Convergent validity is also demonstrated, as each construct has an average variance extracted (AVE) greater than 0.5 (0.564–0.728), following the recommendations of Hair et al. (2019).

Correlation Matrix and Discriminant Validity

Table 3 displays the descriptive statistics (average values, standard deviations) and the correlation coefficients of all studied variables. The correlation analysis found noteworthy correlations among the study's constructs such as DPC, FA, NC, and FP. All variables indicated significant correlations at a level of 0.01 (2-tailed). The kurtosis and skewness of these variables were within a reasonable range and can be regarded as close to normal distribution (Hair et al., 2019).

In Table 3, the discriminant validity is shown by comparing the square root of the estimated average variance extracted (AVE) for each construct with the correlation between that construct and all other constructs in the model, as recommended by Fornell & Larcker (1981).

Common Method Variance Bias

Since our study relied on self-reporting for all variables, there is a potential concern of common method bias. To address this, we followed the approach suggested by MacKenzie & Podsakoff (2012)

Table 3. Correlation matrix, discriminant validity

	Mean	**S.D.**	**DPC**	**FA**	**NC**	**FP**	**Fage**	**Fsize**	**Frevenue**
DPC	*3.622*	*0.873*	*0.788*						
FA	3.556	0.805	0.648**	*0.751*					
NC	3.731	0.831	0.594**	0.655**	*0.780*				
FP	3.543	.868	0.540**	0.628**	0.611**	*0.853*			
Fage	3.42	1.548	0.020	0.018	0.032	0.046	-		
Fsize	3.23	1.474	0.104*	0.056	0.084	0.082	0.463**	-	
Frevenue	2.72	1.134	0.153**	0.085	0.147**	0.160**	0.357**	0.679**	-

Note. S.D. = standard deviation.
** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).
Diagonal elements (*Italic*) are the square root of the AVE. Off-diagonal elements are correlations between constructs.

and conducted Harman's one-factor test on all variables to assess the presence of common method bias. Through the analysis, we found that four factors were identified, and the largest factor accounted for 47.148% ($< 50\%$) of the total variance. This indicates that no single factor explained most of the total variance, leading us to conclude that there is no evidence of common method bias in our study.

Measurement Model and Model Fit

A confirmatory factor analysis (CFA) was conducted to compare the fit indexes of a multifactor model and a single overall latent factor model in which all items designed for the questionnaire were loaded (Hair et al., 2019). The results showed that the multifactor model fits the data ($x2/DF = 1.861$; RMR = 0.038; IFI = 0.956; TLI = 0.950; CFI = 0.955; RMSEA= 0.045) considerably better than the one-factor model ($x2/DF = 4.090$; CFI = 0.837; GFI = 0.727; RMSEA = 0.086; NNFI = 0.796), indicating that no serious threat of common method bias exists in the study.

RESULTS

The previous statistics checks provided evidence for the hypotheses of the research model and a foundation for the following tests (direct, indirect, and total effects) on main variables of the model.

Direct Relationship Analysis

After controlling, a path analysis was performed to test the direct relationships among variables (Table 4). First, results showed that there are significant relationships between DPC and FA (S_estimate = 0.693, $p < 0.001$) and between DPC and NC (S_estimate = 0.691, $p < 0.001$). So, hypotheses H1 and H2 were verified. Direct and significant relationships between FA and FP (S_estimate = 0.496, $p < 0.001$) and between NC and FP (S_estimate = 0.381, $p < 0.001$) were found. Therefore, hypotheses H3 and H4 were supported. However, there is no direct relationship between DPC and FP (S_estimate = 0.032, $p > 0.732$). Thus, hypothesis H5 was not supported.

The above direct effect tests provide the basis for the following mediating effect test.

Mediation Analysis

In this study, two parallel mediating variables are included in the research model: FA and NC. To test the mediation hypotheses, we followed the procedure of Baron & Kenny (1986) that was updated by Zhao et al. (2010) and Collier (2020).

Table 4. Path analysis

Relationship			Estimate	S_Estimate	S.E.	C.R.	P	Result
FA	<---	DPC	0.693	0.766	0.058	12.000	***	Hypothesis H1 supported
NC	<---	DPC	0.691	0.722	0.059	11.654	***	Hypothesis H2 supported
FP	<---	NC	0.381	0.366	0.078	4.892	***	Hypothesis H3 supported
FP	<---	FA	0.496	0.450	0.097	5.129	***	Hypothesis H4 supported
FP	<---	DPC	0.023	0.023	0.068	0.342	0.732	Hypothesis H5 not supported
FP	<---	Firm age	0.005	0.010	0.021	0.254	0.799	-
FP	<---	Firm size	-0.012	-0.021	0.029	-0.413	0.680	-
FP	<---	Firm revenue	0.051	0.070	0.035	1.445	0.149	-

Notes. Model fit: CMIN = 1.882; RMR = 0.069; IFI = 0.958; TLI = 0.952; CFI = 0.958; RMSEA = 0.046
*** $p < 0.001$.

According to Collier (2020), all variables included in the mediation must correlate with each other. Hence, we used the bootstrapping technique to observe the indirect effects of DPC on FP through FA and NC. Then, the examination of the parallel mediation model in SEM led to the results that are presented in Table 5.

The study findings find that FA and NC fully mediate the relationship between DPC and FP. Accordingly, hypotheses H6 and H7 were supported.

Figure 2 shows the significant and nonsignificant paths between the main variables of the final model. Furthermore, the path analysis findings support hypotheses H1, H2, H4, H5, H6 and H7, except for H3 (expressed with dash lines).

DISCUSSION AND IMPLICATIONS

Discussion

This study aimed to explore the influence mechanism of DPC on FP through a parallel mediation model of FA and NC in a specific context. Thus, its purpose was to fill this gap by untangling the indirect role of DPC in FP through FA and NC. Specifically, based on RBV and DC perspectives, a hypothesized research model was built to test relationships among main variables.

Empirically, the findings showed that DPC positively influences FA and NC. These findings are consistent with previous studies (Ahmed et al., 2022; Akmalia & Astuti, 2022; Cenamor et al., 2019; Chen et al., 2014; Khan & Tao, 2022; Melián-Alzola et al., 2020; Mikalef & Pateli, 2017). They confirmed that firms with higher DPC will experience higher levels of FA and NC. First, DPC

Table 5. Mediation analysis

Hypothesis	From IV	Mediation	To DV	Direct Effect	Indirect Effect	Total Effect	Mediation Test
H6	PDC	FA	FP	0.023	0.345**	0.368*	Full (indirect-only mediation) support
H7	PDC	NC	FP	0.023	0.264**	0.287*	Full (indirect-only mediation) support

Note. The number of bootstrap samples is 5000 with 95 bias-corrected confidence intervals.
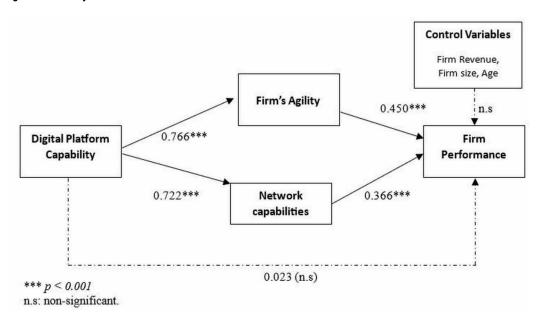* $p < 0.05$; ** $p < 0.01$.

Figure 2. Path analysis model with standardized coefficients

enable firms to access real-time data, foster innovation, promote collaboration, and support continuous learning. This enhances a firm's ability to sense and respond quickly and effectively to changing market conditions. Second, the positive impact of DPC on NC clearly shows that DPC as a lower order capability plays a transformational role on higher order organizational capabilities; specifically, DPC leverage firms' capabilities to manage internal and external information flows and collaborations. This finding also implies that, within the Saudi context, the emphasis on value creation has already shifted from traditional paradigms to interconnected systems (Akmalia & Astuti, 2022; Cenamor et al., 2019; Pietronudo et al. 2022).

The findings also revealed that FA positively influences FP. This fact is confirmed by previous literature dealing with several indicators of performance: innovation performance (Ahmed et al., 2022; Khan & Tao, 2022) and firm performance (Ashrafi et al., 2019; Bai et al., 2023; Khalil et al. 2023). A higher level of agility allows Saudi firms to adapt quickly to market changes, seize opportunities, and respond to challenges effectively. This, in turn, leads to improved firm performance in dynamic business environments.

Similarly, the findings showed a positive relationship between NC and FP which is consistent with previous studies (Akmalia & Astuti, 2022; Cenamor et al., 2019; Ediansyah et al., 2022; Wegner et al., 2023). This finding shows that the leveraged network capability of Saudi firms can facilitate access to diverse resources, discovery of new opportunities, and adaptation to changing market demands, thus improving firms' financial and market performance.

Surprisingly, the study findings revealed that no significant relationship was found between DPC and FP, and this is in contradiction with some other studies investigating the relationship of DPC to growth and competitive or innovation performance (Bhatti et al., 2022; Cenamor et al., 2019; Jiang et al., 2023; Mikalef & Pateli, 2017; Xiao et al., 2020).

DPC indirectly enhances FP, and FA and NC mediate the positive relationship between the two. Nonetheless, the intricacies of digitalization suggest that the enhancement of FP through DPC may not occur directly but rather through the conduit of DC such as FA and NC (Bai et al., 2023; Bhatti et al., 2022; Cenamor et al., 2019; Felipe et al., 2020; Ramdan & Abdallah, 2021). In fact, FA played its role as mediator, confirming previous literature (Bai et al., 2023; Felipe et al., 2020). Enabled by

DPC, FA appeared to directly impact FP and fully mediates the relationships among independent variables (e.g. IT capability, IS capabilities) and performance (Chen et al., 2014; Felipe et al., 2020).

Moreover, NC played a full mediating role between DPC and FP consistent with the studies of Cenamor et al. (2019), Bhatti et al. (2022) and Akmalia & Astuti (2022). It is noteworthy that our findings also align with the findings of Ediansyah et al. (2022) which also showed NC as a full mediator on digital transformation and FP relationship.

Implications

Theoretical Contribution

The study framework used the resource-based perspective and DC, two well-known theories, in its theoretical foundation. The integration of both ideas into a unified framework has expanded the breadth of the concepts and emphasized their significance. Our research has significance due to the following factors.

First, previous scholarly research has shown evidence supporting the positive influence of digital capabilities, including DPC, on FP (Ahmed et al., 2022; Khan & Tao, 2022). Nevertheless, there has been little scholarly investigation into the phenomenon of DPC and its potential influence on facilitating FA to promote FP. Nevertheless, this work aims to fill the existing gaps in the literature by presenting and examining the impact of DPC on FA.

Furthermore, the impact of DPC on FP, which is mediated by NC, has not been well explored in prior research. As noted by Cenamor et al. (2019), there is currently a lack of empirical studies that investigate this relationship. This research aims to fill the existing gaps in the literature by examining the mediating role of NC in the relationship between DPC and FP. However, FA and NC as high-level DC have been tested as mediators in this study and findings showed that DPC positively influences FA and NC.

Moreover, this study makes a theoretical contribution by examining the effects of NC and FA on Saudi FP, building upon prior research conducted by Ahmed et al. (2022), Akmalia & Astuti (2022), Ashrafi et al. (2019), Bai et al. (2023), Cenamor et al. (2019), Ediansyah et al. (2022), Khalil et al. (2023), and Wegner et al. (2023). The study's results indicate that the use of leveraged NC by Saudi enterprises has the potential to enhance both their financial and market performance.

Practical Implications

Our study claims that all dynamic (low and high) capabilities of DPC, FA, and NC can boost firms to enhance their performance in terms of sales, profitability, and growth.

Top Saudi managers must invest in building such DCs in their specific industrial context to acquire and leverage the necessary routines, resources, and capabilities to improve the performance of their firms. They must consider upskilling their human resources in their specialized fields (e.g., IT, CRM, Marketing, SCM) and investing in digital technologies used in their daily works and in interactions and collaborations with their stakeholders. Top Saudi managers must be aware that the sole use of digital technologies does not provide higher level of performance. This should enable them to acquire the necessary DCs such as DPC, FA, and NC to achieve their goals.

CONCLUSION, LIMITATIONS, AND DIRECTIONS FOR FUTURE RESEARCH

This research used a quantitative methodology: a questionnaire to collect data from diverse sectors within the Saudi business environment. It contributes to the literature on DPC, FA, NC, and FP and addresses the research gap by conducting an investigation of the relationship between DPC and FP through the mediating roles of FA and NC.

Although this strategy improves the validity and generalizability of our findings, it also limits the depth of our understanding of the examined concepts and their relationships within different

contexts. To address this limitation, future studies should employ qualitative research methodologies to conduct an in-depth investigation into niche sectors, such as family-owned enterprises, fintech and e-commerce firms, or B2B firms. This would be particularly helpful in gaining deep and enriched contextual understanding and insights for Saudi Arabia.

Moreover, considering a moderated mediation approach in future research can provide important insights into how, whom, and when the mediating effects of FA and NC on DPC and FP relationship are revealed. This can be done by combining variables from Technology, Organization and Environment (TOE) frameworks within the perspective of RBV to build a more comprehensive research model.

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APPENDIX

Convergent validity and reliability

Construct	# Items	Factor loading	% Variance	KMO	Cronbach's Alpha	CR	AVE
Dependent variable							
FP	FP1: Our company has a better return on investment than our competitors.	0.854	72.844%	0.875	0.907	0.931	0.728
	FP2: Our company has a better return on sales than our competitors.	0.859					
	FP3: Our company has better growth in sales than our competitors.	0.853					
	FP4: Our company has growth in profit than our competitors.	0.849					
	FP5: Our company has better growth in market share than our competitors.	0.852					
Mediators							
FA	Compared with your major competitors, how easily and quickly can your organization perform in the following activities:		56.358%	0.921	0.889	0.912	0.564
	FA1: Respond to changes in aggregate consumer demand.	0.762					
	FA2: Customize a product or service to suit an individual customer.	0.740					
	FA3: React to new product or service launches by competitors.	0.760					
	FA4: Introduce new pricing schedules in response to changes in competitors' prices.	0.750					
	FA5: Expand into new regional or international markets.	0.749					
	FA6: Change (i.e., expand or reduce) the variety of products/services available for sale.	0.740					
	FA7: Adopt new technologies to produce better, faster, and cheaper products and services.	0.766					
	FA8: Switch suppliers to avail of lower costs, better quality or improved delivery times.	0.739					

Convergent validity and reliability

Construct	# Items	Factor loading	% Variance	KMO	Cronbach's Alpha	CR	AVE
NC	NC1: In our company we have regular meetings for every project.	0.734	60.873%	0.952	0.941	0.949	0.609
	NC2: In our company employees develop informal contacts among themselves.	0.718					
	NC3: In our company managers and employees often give feedback to each other.	0.797					
	NC4: In our company we analyze what we would like and desire to achieve with which partner.	0.800					
	NC5: In our company we develop relations with each partner based on what they can contribute.	0.714					
	NC6: In our company we discuss regularly with our partners how we can support each other.	0.743					
	NC7: In our company we have the ability to build good personal relationships with our business partners.	0.754					
	NC8: In our company we can deal flexibly with our partners.	0.785					
	NC9: In our company we almost always solve problems constructively with our partners.	0.750					
	NC10: In our company we know our partners' markets.	0.771					
	NC11: In our company we know our partners' products/procedures/services.	0.800					
	NC12: In our company we know our partners' strengths and weaknesses.	0.754					
Independent variables							
DPC	DPC1: Our platform easily accesses data from our partners' IT systems.	0.806	62.115%	0.932	0.912	0.929	0.621
	DPC2: Our platform provides seamless connection between our partners' IT systems and our IT systems (e.g., forecasting, production, manufacturing, shipment).	0.832					
	DPC3: Our platform has the capability to exchange real-time information with our partners.	0.787					
	DPC4: Our platform easily aggregates relevant information from our partners' databases (e.g., operating information, business customer performance, cost information).	0.789					
	DPC5: Our platform is easily adapted to include new partners.	0.749					
	DPC6: Our platform can be easily extended to accommodate new IT applications or functions.	0.787					
	DPC7: Our platform employs standards that are accepted by most current and potential partners.	0.802					
	DPC8: Our platform consists of modular software components, most of which can be reused in other business applications.	0.750					

Faouzi Ayadi is an Assistant Professor (HDR) of Business Management (Management Information Systems) at the College of Business at Imam Mohammad Ibn Saud Islamic University (Riyadh – Kingdom of Saudi Arabia). He received his M.Sc. degree from Bordeaux 4 University (France) and his Ph.D. degree in Business Management (specialty: Management Information Systems) from Toulouse 1 University (France). He teaches graduate and undergraduate courses on Management Information Systems. In addition to his experience as an Assistant Professor in Tunisia and Saudi Arabia, Dr. Ayadi is a regular contributor to scientific conferences and Journals in both French and English languages. His research interests include Inter-Organizational Information Systems Adoption, Customer Relationship Management (CRM), Information Systems and Knowledge Management, Cloud Computing Adoption, New Technology and Knowledge-Based SME's, Blockchain and Big data, Entrepreneurship and innovation. He has authored and co-authored multiple articles in reputable international journals (Electronic journal of of Information Systems in Developing Countries; International Journal of Entrepreneurial Behavior and Research; International Journal of Gender and Entrepreneurship; International Journal of Technology and Human Interaction among others).

Thamir Alaskar is an Associate Professor in Management Information Systems and member of the university council at Al Imam Mohammad Ibn Saud Islamic University. He holds a Ph.D. degree in Business and Management (Topic: Business Intelligence Maturity Model: Information Management perspective) in 2016 from the University of Manchester, and an MSc. degree in Strategic Information Systems from East Anglia University. He served in the university as the dean of business college and head of business administration department. Also, he served in the semi-government and private sectors as a System Analyst and Manager of the Business Intelligence department. He is currently a member of the Saudi Management Association in Saudi Arabia and chairman of the investment committee at Al Imam Mohammad Ibn Saud Islamic University. He has presented his research at international conferences and published BI, business analytics, big data, supply chain management, and project management research articles in different journals. His research interests include big data, business intelligence, information management, business analytics, IT/information systems maturity models, strategic information systems, digital transformation, and project management.

Wassim J. Aloulou is an Associate Professor at the College of Business at Imam Mohammad Ibn Saudi Islamic University, Riyadh, KSA. He received his Ph.D. in Management Sciences from the University of Pierre Mendes, France Grenoble 2, France, and from the Faculté des Sciences Economiques et de Gestion de Sfax, Tunisia in 2008. He teaches graduate and undergraduate courses on entrepreneurship in MBA and BBA programs. His research interests currently focus on digital entrepreneurship, FinTech, innovation, entrepreneurial intentions, and orientations of individuals and organizations. He has authored and co-authored multiple articles in reputable international journals with impact factors (e.g., Technological Forecasting and Social Change, International Journal of Entrepreneurial Behavior and Research; European Journal of Innovation Management, International Journal of Logistics Management, Business Process Management Journal, and indexed in ESCI: e.g., Journal of Small Business and Enterprise Development, Journal of Entrepreneurship in Emerging Countries, Administrative Sciences, FIIB Business Review among others), books with IGI Global on Business Transformations in the Digital Era and on Entrepreneurship and Organizational Resilience during Unprecedented Times, and multiple book chapters on Incubation, social entrepreneurship, women's economic empowerment, and Entrepreneurial and Business contexts (with Edward Elgar, IGI Global, and World Scientific publishers).

Amin K. Alsadi is an Assistant Professor in E-Business, Business Administration Department, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia. His research interests include Supply Chain Management, Data Analytics, Technology Adoption, Entrepreneurship, Strategic Orientations.