Mastering digital leadership capabilities for business model innovation: the role of managerial decision-making and grants

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Abstract

Purpose - Research has shown that business model innovation can facilitate most ventures to innovate and remain competitive, yet there has been limited work on how digital leadership capabilities influence business model innovation. Building on the dynamic capabilities view, we address this gap by linking digital leadership capabilities with business model innovation via managerial decision-making through provision of grants received by new ventures.

Design/methodology/approach – The study is cross-sectional research. Data has been collected utilizing purposive sampling from 313 founding members of new ventures in high-velocity markets i.e., from Pakistan. SPSS has been used to conduct the moderated mediation analysis.

Findings – Digital leadership capabilities foster the business model innovation of the new ventures because they enable new ventures to capitalize on digital technologies and create new ways of generating value for the customers and themselves. Moreover, managerial decision-making mediates digital leadership capabilities and business model innovation relationship and grants moderate the indirect positive effect of digital leadership capabilities on business model innovation via managerial decision-making. The study generates initial evidence on the impact of digital leadership capabilities on business model innovation via managerial decision-making for new ventures. We advance knowledge on new ventures' business model innovation by deep-diving into dynamic capabilities view and emphasizing digital leadership capabilities as a significant driver for business model innovation.

Originality – With the help of dynamic capabilities theory, this study analyses how new ventures make use of digital leadership capabilities to promote business model innovation.

Keywords: Business model innovation, managerial decision-making, digital leadership capabilities, new ventures, grants

Paper Type Research Paper

Introduction

Companies throughout the world are increasingly focusing on digital technologies to adequately adjust their strategies to changing market requirements, address customers' concerns better, and come up with new ways to generate value for the customers and for themselves (Caputo et al. 2021). Blockchain, AI, and big data are accelerating this trend by changing how firms do business (Ancillai et al. 2023; Chong et al. 2019). Companies are changing their business models to capitalize on technology and compete in increasingly competitive markets. Tech businesses like Airbnb, Uber, and Facebook have had to adjust to new economic paradigms and digital technological revolutions (Chesbrough, 2011). According to Teece (2010) business models represent "the manner by which the enterprise delivers value to customers, entices customers to pay for value, and converts those payments to profit". Thus, the digitalization of processes may influence business models and have serious consequences for established firms and new ventures (Ancillai et al. 2023). New digital technologies have drawn scholarly attention to understand the influence of digital technologies and business model innovation (Ancillai et al. 2023; Bouwman, Nikou, and de Reuver 2019; Caputo et al. 2021; Lee et al. 2019) to open the black box of the relationship. Digital technologies refer to electronic tools, devices, or systems that can generate, process, and store data (Fitzgerald et al., 2014).

In this regard, knowing the crucial role of leaders is critical for the efficient use of digital technologies to achieve desired results because they are the only ones who understand the potential of digital technologies for implementing changes and achieving desired results. With a drastic change in technology, digital leaders are said to achieve 1.8 times higher earnings growth than the digital laggards (Forth et al., 2020) and unfortunately, only 7% of the companies are led by digitally competent teams (Weill, Woerner and Shah, 2021). One classic example of Digital Leadership is that of Jeff Bezos, who has been a pioneer in Digital leadership at Amazon (Westerman et al., 2012) where Amazon's digital leadership has been a major factor in its success enabling it to stay ahead of its competitors and continuously innovate to meet the changing needs of customers. Nevertheless, digital leadership capabilities enable new ventures to align with the digital age and make sufficient use of modern technology platforms (AlAjmi, 2022). Furthermore, digital leadership capabilities are becoming increasingly vital as they help new ventures to better understand their consumers' digital needs and implement necessary adjustments in business models to remain competitive. Digital leadership capability is the process of building digital capabilities within the organization to improve performance (Hearsum, 2015). Digital leadership capabilities also facilitate changes in new ventures by ensuring that no employee remains behind in the process of adjustments performed to meet competitive environment requirements (Chatterjee and Kar, 2018). Extant literature has explored digital leadership's influence on innovation performance (Benitez et al., 2022), innovation capabilities (Borah, Iqbal and Akhtar, 2022), innovation management (Mihardjo, Sasmoko, Alamsyah and Elidjen, 2019), and innovative work behaviour (Erhan, Uzunbacak and Aydin, 2022), however, the landscape of business models in new ventures is still less explored, demanding a careful investigation to uncover innovative possibilities and explain the mechanism of digital leadership capabilities and business model innovation. To improve our understanding of the relationship between digital leadership capabilities and business model innovation for new ventures, we need to take a more complete and comprehensive approach that aligns with the dynamic character of markets and new venture landscapes. Thus, based on this motivation, this research examines the relationship between these capabilities and business model innovation in the context of new ventures.

We also explored the mechanism that explains the relationship between digital leadership capabilities and business model innovation. In this regard, managers' roles and decision-making are critical because, in this digital age, leaders want managers to understand the possibilities provided by digitization and, more specifically, to generate value from creative business models. Decisions of managers impact the value and viability of the ventures, therefore, burdening them to make optimal decisions (Evers and Andersson, 2021). Thus, managers listen to leaders and help implement changes for resource allocation, innovation, strategy alignment, and performance improvement, to keep organizations competitive in a fast-paced business environment. Hence, we can infer that the relationship between digital leadership capabilities and business model innovation is influenced by managerial decision-making acting as a mediator.

Additionally, new ventures require grants for development and growth, in addition to implementing changes according to emerging requirements. Winning grants also enable new ventures to establish their credibility among investors, customers, and partners and facilitate new ventures in their pursuit to win further grants (Shinkle and Suchard, 2018). As a result, grants are essential as financial assistance contributing to the development of new companies, as a lack of early cash remains a major barrier for many new ventures (Barba-Sanchez and Atienza-Sahuquillo, 2012). Keeping in view the importance of grants for new ventures, we theorize in the current study that grants moderate the relationship between digital leadership capability and business model innovation via managerial decision-making.

This study's contribution to literature is threefold. Firstly, this study contributes to the literature on digital leadership capabilities and business model innovation relationship using dynamic capability theory as it explains how firms may innovate their business models regularly, ensuring they stay relevant in shifting marketplaces. By doing so, this research responds to Evers and Andersson (2021) call for additional investigation into decision-making processes within new ventures across various contexts and industries, noting that the current literature on this topic remains limited. Secondly, this research explains the mechanisms by which digital leadership capabilities influence business model innovation and considers the pivotal role of managerial decision-making in this relationship. Earlier studies have also highlighted significant role of management decision-making in organizational growth (Cao, Duan, Edwards and Dwivedi, 2021; Laskovaia, Marino, Shirokova and Wales, 2018). Lastly, this research further explores the grants as boundary conditions that moderate the mediating relationship of managerial decision-making between digital leadership capabilities and business model innovation. Grants are significant for survival of new ventures to grow, retain, and generate income. Thus, this study helps us understand business model innovation issues and how external resources impact success as grants can play an important role in supporting innovative venture initiatives, particularly those with strong digital leadership capabilities and effective decision-making processes.

Theoretical Review and Hypothesis Development

Dynamic capabilities view (DCV)

The dynamic capability concept emphasizes an organization's capabilities determine its competitive edge. According to the dynamic capability viewpoint, digital leaders must have skills to lead their organizations to growth and innovation. Such qualities include digital media proficiency, long-term planning, and the willingness to try new methods to achieve corporate goals. Startup leaders may help their employees adapt to the ever-changing digital environment by promoting inventiveness. Overall, the dynamic capacities approach emphasises establishing a future-focused, adaptable, and success-driven leadership mentality (Chatterjee, Chaudhuri, Vrontis and Giovando, 2023). This demonstrates that leaders must constantly improve abilities like digital leadership to seize new possibilities and rejuvenate what they have (Kaur and Mehta, 2016). This enables emerging enterprises adapt faster to changing customer tastes and market conditions, offering them an edge through creative business models (Chatter, Chaudhuri and Vrontis, 2022). Digital leadership traits must be utilized through managerial decision-making to affect an organization's performance (Chatterjee, Rana and Dwivedi, 2021). These capabilities (in the current study taking the digital leadership capability) need to be translated into action which we propose is done efficiently via managerial decision making thereby impacting the performance of an organization (Chatterjee, Rana and Dwivedi, 2021). This perspective asserts that ventures must possess the ability to build, integrate, and reconfigure their resources and capabilities in response to shifting market demands and technological advancements. By doing so, ventures can sustain competitive advantage and drive long-term success. The dynamic capabilities framework is used to examine how management decision-making with a grant boundary limitation affects digital leadership capability, business model innovation, and mediation effects. DCV was used as a theoretical foundation for the research components in previous works (Ciampi et al., 2021; Mikalef, Boura, Lekakos, and Krogstie, 2019).

Digital Leadership and Business Model Innovation

Nowadays, it has become essential to address the expectations of digitally knowledgeable clients, necessitating adopting a digital business strategy and favourable leadership competencies to achieve a successful digital business strategy (Sia, Soh and Weill, 2016). Additionally, new abilities for leaders are necessary due to digital disruption (Kane, Phillips, Copulsky and Andrus, 2019). Digitalization improves productivity and attracts new customers, but executives must have digital leadership skills to strengthen their company's creative performance (Benitez et al., 2022). As firms go through the digital world, leaders will be expected to direct innovation, performance, and other critical business characteristics (Majid et al., 2023). Digital leadership abilities also help firms innovate business models, giving them an edge in the market (Mihardjo et al., 2019).

Due to the exponential rise of digital technology, organizations need digital leadership to succeed in the digital economy. According to a study conducted by Daugherty et al (2021), digital leaders have increased their technology spending and are now expanding five times faster than laggards. Such leaders are closing gap with other successful leaders via adoption of digital technology which is an essential step to succeed in the digital landscape (Daugherty *et al.*, 2021).

While existing studies have focused more on established businesses in exploring digital leadership's impact on business model innovation, there remains a notable void in the literature concerning its implications for new ventures (Safdar *et al.*, 2019). Common belief holds that well-established organizations are more adaptive due to their better resources (Antolin-Lopez et al., 2015). On the other hand, despite the potential for disruptive innovation of new ventures, they may face unique hurdles in translating digital leadership into business model innovation which requires further exploration and adding new evidence to the literature. In a digitally disrupted environment, emerging businesses that use digital leadership abilities to innovate business models will likely be adaptable, competitive, and resilient. The digital world is complicated by data privacy, cybersecurity, and regulatory compliance. Strong digital leadership helps companies navigate difficult terrain. To add to the expanding corpus of research, this study will examine the complex relationship between digital leadership qualities and business model innovation.

Consistent with prior work, we expect that digital leadership capabilities are likely to positively impact business model innovation in new ventures, thus we come up with the following hypothesis:

H1: Digital leadership capabilities positively impact business model innovation of new ventures.

Mediating Role of Managerial Decision-Making

It is evident that digital technology assists an organization's success, however, adding new technologies does not only drive transformation within an organization as these technologies can be imitated (Benitez et al., 2022). Therefore, other integral factors play a crucial role in driving transformation, and we propose a key factor to be managerial decision-making. A significant factor impacting the firm performance includes the strategic decisions made by the management. Strategic decisions being made can impact the profitability of the firms (Azar, 2021) as decision-making tends to be critical for the health and survival of an organization (Eisenhardt and Zbaracki, 1992).

Literature suggests that the digital age has indeed impacted the decision-making in firms (Nauhaus, Luger and Raisxh, 2021). Digitalization brings challenges for leaders, and they have to deal with disruptive changes based on which they need to make decisions. The technological advances have resulted in massive changes in leadership and decisions (Schwarzmuller, Brosi, Duman and Welpe, 2018). Therefore, it is expected that digital leadership capabilities are likely to have a significant impact on managerial decision-making. Moreover, managerial decision-making is important as organizations need to leverage digital leadership through managerial decision-making to make data-driven decisions that align with their strategic goals.

Studies have demonstrated that excellent decision-making in innovation management may boost organizational performance (Yue, 2022; Asad et al., 2021; Mehmood, 2021). Studying the relationship between digital leadership and managerial decision-making might help emerging firms improve their innovation management and performance. Managers' digital leadership abilities may strengthen this link by making strategic, data-driven decisions that support the organization's goals (Delbecq and Mills, 1985). Managers may use digital technology and innovation to learn about customer behaviours, market trends, and new tech to make choices and innovate, specifically in emerging markets (Temel *et al.*, 2013). New businesses must understand the role of digital leadership in management decision-making to compete in fast-paced, digitally driven environment. By making strategic decisions utilizing digital leadership abilities, managers may foster innovation and business model innovation.

Considering a new technology venture that has developed a cutting-edge product with significant market potential. The venture requires a significant investment to scale up production and bring the product to market. The CEO and management team must decide how to allocate limited resources, such as funding and personnel, to achieve their strategic objectives. Through effective decision-making, the management team can prioritize initiatives, mitigate risks, and capitalize on opportunities to propel the venture forward. In contrast, poor decision-making can result in missed opportunities, overallocation of resources, and failure to achieve strategic objectives. Hence, effective managerial decision-making is crucial for the success of new ventures in the competitive landscape.

We posit that it has become necessary for leaders to possess digital leadership capabilities given the need of the hour to lead a successful startup. This further leads to making such decisions that contribute towards innovation in the new ventures through business models. As such, we expect the following:

H2: Managerial decision-making mediates the relationship between digital leadership capability and business model innovation of new ventures.

Moderating role of Grants

Lim, Tang, and Bowen (2021) found that grants play a crucial role in stimulating innovative activities in technological companies by providing different forms of support, such as subsidies, funding programs, and loans. Grants come in various forms, including support for business development, consulting services, marketing, product development, and technological development. Receiving grants can also help firms secure further financing, increasing their chances of survival and promoting innovation. Private funding can further enhance innovation efficiency within firms (Hong, Feng, Wu, and Wang, 2016).

Many studies show that grants boost firm survival, revenue, and total factor productivity (2020). These include Dvoulety, Srhij, and Pantea research. Grants help companies optimize resource use and strategic decision-making (Sarhoj, Skrinjaric, and Radas, 2019). Grant subsidies enhance corporate innovation, according to Le and Jaffe (2016), whereas investment grants boost worker productivity, according to Alexandre, Chaves, and Portela (2022). These findings demonstrate that grants improve technical firm performance and innovation.

Grants allow the new ventures to launch new projects and achieve its strategic goals for market expansion and growth. Several new ventures that have secured grants have been able to develop and expand. Startups may invest more in R&D with more grants and making smarter selections. Grant-funded training programs can help managers make better decisions and learn more. Grants may also support consultants and other professionals to advise on complex business challenges. Therefore, grants can boost the firm's decision-making and market competitiveness by subsidizing innovative business models. For example, if a new venture receives a grant for developing a new product, the additional resources can be used to fund market research to understand the target market and consumer preferences and make informed decisions about product design and marketing strategy. Therefore, grants are crucial for better managerial decision-making and innovation in new ventures.

We suggest that grants are required by the leaders to support managers' decision-making for various critical decisions required to improve innovation such as innovation of new business models as illustrated in Figure 1. Consequently, we posit the following hypothesis:

H3: Grants moderate the mediating influence of managerial decision-making on the relationship between digital leadership capabilities and business model innovation.

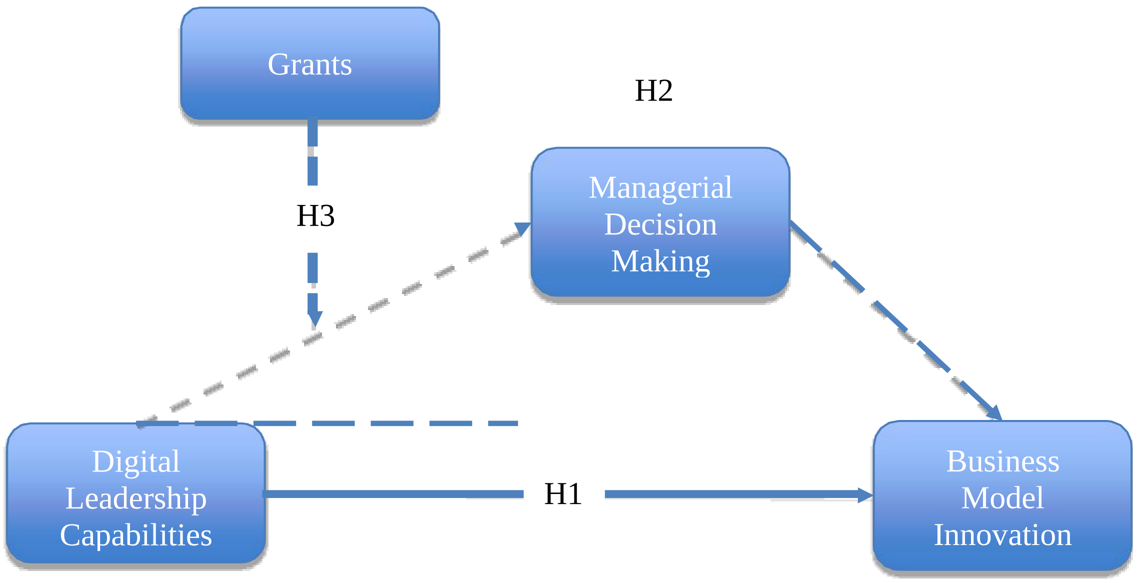

Figure I: Digital Leadership Capabilities Influence on business model innovation: mediating role of managerial decision making and moderating role of grants.

Methodology

To test the research hypothesis, the data was collected from Pakistani Entrepreneurs (founders/co-founders). The Global Startup Ecosystem Report 2023 reported that Pakistan's economy has massive potential to grow, and startups tend to be a critical element for the growth (Frimodig and Torkkeli, 2017). The digital infrastructure in the country has received special attention in recent years with a special focus on the 5G spectrum. The country has not yet seen its unicorn, but it will happen soon if more funding and investment is provided to the startups (Global startup ecosystem report, 2023). Business model innovation contributes towards businesses having a sustainable competitive advantage regardless of its unicorn status as it is difficult for rival firms to imitate the entire business model (Bashir & Verma, 2017). Business model innovation, irrespective of the valuation of the company contributes towards operational efficiency, customer engagement, market positioning, and long-term growth. Pakistan as 5th largest country by population has witnessed number of start-ups that have raised national and international fundings such as Daraz is a Pakistan-based online marketplace that operates in Pakistan, Bangladesh, Myanmar, Sri Lanka, and Nepal and acquired by Alibaba group in around 200 million dollars (The News, 2018). Moreover, number of other startups in Pakistan has raised recently fundings from international investors such as Bykea, Careem Pakistan, and NayaPay. One more such example is NayaPay, a Pakistan-based fintech platform, has raised $13 million in a seed round to launch its multi-service messaging and payment app, as well as payment acceptance and financial management tools for South Asian enterprises (Njanja, 2022). These acquisitions demonstrate the strength and expansion of Pakistan's startup ecosystem. Pakistan has several brilliant entrepreneurs and inventors working on new solutions to the country's problems. The Pakistani government is also supportive of the startup environment, having put in place a variety of regulations to stimulate entrepreneurship (Haider *et al.*, 2017; Nazir and Yu, 2023). Therefore, Pakistan is a relevant context for investigating the business model innovation in new ventures as number of start-ups are not only dealing with local markets but also internationally (Eisenberg, 2022) and has one of the fastest growing middle classes where there are more than 120 million broadband subscribers (PTA, 2023). Further, as the regulatory and cultural barriers have started to soften, there are more foreign investors making significant bets on the local new ventures in Pakistan (Eisenberg, 2022).

The proposed model has been tested with a sample of 313 founders/co-founders of new ventures. By definition of new ventures, those start-ups were considered that had an age of less than 8 years into operation (Miller and Camp, 1985). Survey based on the structured questionnaires were used to collect the data from these start-ups. We administered the questionnaire for this study online via purposive sampling (LinkedIn, and by emailing the incubation centers/startup-related organizations across Pakistan). Purposive sampling has been used in the study as those individuals were reached that were founding members of new ventures (ventures with ages less than 8 years) thereby ensuring survey distribution to relevant individuals (Campbell et al., 2020). A total of 2100 surveys were floated, and the response rate obtained was 16.5%. The original data contained 346 responses. Those responses were removed that contained a significant number of missing data (28 responses) and did not fall under the definition of new venture (5 responses). Therefore, a final sample of 313 Pakistani founding members (founders/co-founders) was generated. To test the trajectories of the relationships, we test the DCV theory and acknowledge that the explanatory model is not proof of causality. Lastly, this adopts rigorous statistical procedures to take care of possible errors.

Non-response bias has also been tested in the same manner as in the study of Molly et al (2019) to ensure that the sample is representative of the whole. Groves and Peytcheva (2008) conducted a meta-analysis highlighting relationship between nonresponse rates and bias. They argue that if the non-response rates are higher than it introduces bias in the results. To tackle the non-response bias, various strategies were employed. Efforts were made to maximize the response rate by employing proven methods such as personalized invitations, clear instructions, and multiple reminders to potential participants. This approach aimed to encourage a higher level of participation and reduce the likelihood of biased results due to non-response (Armstrong and Overton, 1977). Following data collection, a thorough analysis was conducted to assess the presence of non-response bias. The characteristics and demographic variables of the early respondents were compared with those of the later respondents. This comparison sought to identify any substantial differences between the two groups that could potentially influence the study outcomes. Scholars suggest that the survey responses need to be divided into early responses and late responses (Centobelli et al., 2019). A total of 159 respondents were considered to be late respondents. T-test was used to compare the demographics to observe if a non-response bias exists (Centobelli et al., 2019). As P>0.05 therefore, we rule out the non-response bias possibility.

Common method variance is caused due to the measurement method. In the questionnaire, the deviation in commonly used methods is controlled by disrupting the logical order of the scale items (Dost *et al.*, 2016; Yu *et al.*, 2022). The common method bias was avoided by making the survey questions clear, concise, and accurate and by maintaining the anonymity of the respondents (Rodriguez-Ardura and Meseguer-Artola, 2020). Also, exploratory factor analysis has been carried out to ensure that there is no common method variance. The first unrotated factor variance is less than 40% which reflects that there are no issues of common method variance in the study. The same method has also been used in the study of (Majali *et al.*, 2022).

The scale used in the current study are adopted from the established literature. comes from the mature scale developed which was tested by well-known scholars. The current study measures three constructs that are composed in the conceptual model. The already developed questionnaire was tailored in the context of new ventures. The measure of digital leadership capability has been adapted from the study of Benitez et al (2022) who adopted it from (Li *et al.*, 2016) with 4 items. The scale ranges from strongly disagree (1) to strongly agree (5). The internal consistency was high with a Cronbach alpha value of 0.876. We measure managerial decision-making utilizing 7 items adapted from (Lawler and Boudreau, 2009; Samson and Bhanugopan, 2022). The variable is measured on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). A high internal consistency was reported i.e., α = .891. Business model innovation is based on scale of (Ahmed *et al.*, 2022; Latifi *et al.*, 2021) and composed of six items. Each item was measured using a scale that ranged from 1 to 5 where 1 indicates strongly disagree and 5 indicates strongly agree. The scale possessed good internal consistency with a .792 value of Cronbach alpha. The overall reliability of the questionnaire was reported to be excellent i.e., .880. The scale of Latifi, Nikou, and Bouman (2021) was also adopted in the study of Molina-Castillo (2022) and Ahmed et al (2022). A summary of the measurement scales, reliability constructs, and sample items are provided in Table II. According to Hair et al (2011), the value of Cronbach alpha above 0.7 indicates high reliability, and therefore the scales selected have high reliability.

In order to account for the extraneous variables, this study included four control variables. The first control variable in the study was new venture profitability which has been shown to influence innovation (Li and Fu, 2022). The second and third controls are founding member's work experience and education which have been shown to influence product innovation in new ventures (Marvel, Wolfe and Kuratko, 2020). The fourth control in the study is the number of women on the founding team as studies have shown it influences the firm innovation (Lee and Chung, 2022).

In the current study, we conducted a national-level survey i.e., the founding members belonged to all over Pakistan (all provinces); Punjab (123, 39.2%), Islamabad Capital Territory (48, 15.3%), Khyber Pakhtunkhwa (49, 15.6%), Sindh (75, 23.9%), Baluchistan (6, 1.9%), Gilgit Baltistan (11, 3.5%), and AJK (1, 0.3%). The sample consisted of the majority males (260, 83.1%). Majority of the new venture had a team size of less than and equal to 5 (91, 29.1%), followed by 6-10 team members (81, 25.9%), 11-15 team members (50, 16%), 16-20 team members (25, 8%), 26-30 team members (4, 1.3%), and above 30 team members (47, 15%). The majority of the new ventures were profitable (222, 70.9%) whereas the remaining were not profitable. A large number of the respondents had completed their bachelors (172, 55%), followed by Masters (118, 37.7%), Others (8, 2.6%), Doctorate (7, 2.2%), Intermediate (7, 2.2%) and Diploma (1, 0.3%). For the founder's experience, 29.4% (92) of the respondents had 4-6 years of experience, 29.4% (92) had 10 years and above years of experience, 18.5% (58) had 1-3 years of experience, 14.4% (45) 7-9 years of experience, 6.1% (19) had less than one year of experience and 2.2% (7) had no experience. There were no female founding members of new ventures for a vast majority (211, 67.4%), 1 female founding member for 22.7% (71) of the new ventures, 2 female founding members for 7.3% (23), 3 female founding members for 1.6% (5), 4 female founding members for .3% (1) and 5 female founding members for .6% (2). The statistics are presented in Table I.

Pre-test and Pilot Testing

We pre-tested our questionnaire from the actual sample to improve our survey (Junaid *et al.*, 2023). To improve the study design, pilot testing was carried out using a sample of 31 respondents as the minimum recommended sample for a pilot study is 30 (Delice, 2010). We obtained a high validity (Cronbach alpha value) for our variables via pilot study i.e., Digital leadership capability (α = .923), Business model Innovation (α = .833), and managerial decision making (α = .898).

Validation

Confirmatory factor analysis was conducted to measure the reliability, discriminant, and convergent validity of the study (Tariq *et al.*, 2023). The structural model covering digital leadership capabilities, managerial decision making, business model innovation, and grants showed excellent fit to the data (p<0.001, CFI= .998, NFI= .997, RFI= .983, PCMIN/DF=1.8) (Centobelli et l., 2019). The value of CMIN/df is 1.8 which is less than 5 indicating the model is well adapted. As indicated in Table II the composite reliability (CR) values are above 0.80 which are statistically viable. All the AVE values are above 0.5 suggesting that there is good convergence validity of the scale suggesting that all measures are equally important in measuring the constructs associated. The multicollinearity test shows that the variance inflation factor is less than 10 which indicates that there are no serious multicollinearity issues in the scale.

Table II reflects the corrected item-total correlation (CITC) value that is considered for the reliability analysis (Zott et al., 2011). The CITC values reported are above 0.30 which is above the minimum recommended threshold for reliability (Centobelli et al., 2019). Table II shows the standardized factor loadings which are all above the threshold of 0.50 reflecting that the items are statistically reliable.

Analysis and Results

The descriptive statistics and correlation values between the variables are given in Table III. The strength and direction of the relationship between the independent, dependent, mediating, and moderator variables is reflected in Table III. The table reflects the mean and standard deviation values of the variables under study. This enabled us to test the model.

To test the hypothesis of this study, we make use of PROCESS Macro to test the moderated mediation analysis (bootstrapping 5000 samples, 95% confidence interval). Our study theoretically explains the relationships between the said variables by analyzing them. Table IV represents the results for the direct and indirect effects of the moderated mediation model (Hypothesis 1-3). Results indicate that digital leadership capability significantly and positively impacts business model innovation (B=.203, p=.0000), thereby supporting hypothesis 1. Results reflect (Table IV) that digital leadership capability is positively and significantly related to managerial decision-making (B=.2742, p=.00). A positive and significant relation exists between managerial decision-making and business model innovation (B=.3484, p=.0000). Our results direct that there is a significant (p=.0000) indirect effect of the independent variable on the dependent variable (B=.0955) reflecting mediation of managerial decision making between the relationship of digital leadership capability and business model innovation supporting hypothesis 2.

This study tests the moderated mediation by adding grants as the potential moderator of the relationship. Table V represents the results of the moderated mediation analysis. Results reflect that the positive relationship between digital leadership capability and managerial decision-making is stronger when startups win grants (B=.5138; p=0.0000) as compared to when startups do not win any grants (B=.2234; p=.0000). The same relationship is also reflected in Figure II via visual representation of the results.

Results reflect that the mediation effect of managerial decision-making between digital leadership capability and business model innovation is significantly moderated by grants [.0164;.1929] such that the effect is stronger when new venture has won grants (Effect=.1790) as compared to when the new venture has not won any grants (Effect=0.0778). There is no zero between the confidence interval value and the value remains positive. These results provide support for the hypothesis 3 of the study. This means that when the new ventures have won grants then it tends to support the business model innovation more than having won no grants.

Discussion

In this study, we found a significant positive relationship between digital leadership capability and business model innovation in the context of new ventures and added knowledge to the literature. We also delineate the relationship between digital leadership capabilities and business model innovation by exploring the mediating role of managerial decision-making. We found that managerial decision-making mediates the relationship between digital leadership capabilities and business model innovation. Furthermore, we also found that grants moderate the mediating role of managerial decision-making on the relationship between digital leadership capabilities and business model innovation.

Relying on the dynamic capability theory, our findings contribute to the literature on digital leadership capability and business model innovation by providing additional evidence in the context of new ventures. We argue that digital leadership capabilities are highlighted as essential to enhance the business model innovation of new venture firms as leaders' roles in guiding innovation, improved performance, and in other essential areas of the business is likely to be increasingly important (Majid et al., 2023). Digital leaders can facilitate innovation in the digital realm where new ventures can expand faster than laggards. These findings reinforce the earlier studies that digital leadership capabilities play an important role in the innovation performance of the firms (Mihardjo et al., 2019).

This reflects that employees must be encouraged to try new things and take risks within the organization which ultimately can lead to development of new and innovative business models. In this way, leaders can keep up with digital trends and how to apply them to their businesses. Our results are in line with the research work of Chatterjee, Chaudhuri, Vrontis, and Giobandi (2023) who conclude that digital leadership capability is integral for the digital transformation of the workplace and organizational performance.

This study also found that management decision-making mediates digital leadership and business model innovation. New ventures need managerial decision-making to set a successful direction, in our experience. Managerial decision-making further enables the new ventures to manage their risks, build appropriate teams, allocate resources, and adapt to change. Integral decisions can be made for team motivation, organizational culture, financials, business strategy, marketing, and adopting technology. We conclude that through the managerial decision-making process, managers make such decisions with the help of their digital leadership capabilities that ensure the efficiency of the strategic decisions being taken in the new ventures. Our results are supported by previous literature that reflects that managerial decision-making impacts the firm performance in a positive manner (Alhawamdeh and Alsmairat, 2019; Kunc and Morecroft, 2010).

Moreover, the current study contributes to the strategic management literature by demonstrating for the first time the significant positive mediating role exerted by managerial decision-making in the digital leadership capability and business model innovation relationship. The findings of our study provide two principal considerations. Firstly, digital leadership capabilities encourage managers to make such decisions that drive the new ventures towards digital transformation enabling them to become more adaptive in a rapidly changing technological world (Nagel, 2020). It is the responsibility of digital leaders to make such decisions that ensure that the employees are involved in the digital transformation process (Islam, Ahmad and Ahmed, 2022). In particular, in the presence of digital leadership capability, more favorable managerial decisions can be taken for new ventures that contribute towards innovation within the new venture.

Digital leaders tend to harness their capabilities to guide the process of decision-making and by doing so they tend to fill in the gap between visionary leadership and business model innovation. Our study reinforces the holistic understanding that digital leadership efficacy extends beyond only a direct impact on business model innovation. The relationship between the two intertwines with the landscape of decision making which acts as a catalyst for transformative changes in the business model of the new ventures. These findings reinforce the earlier studies focused on managerial decision-making and its impact on the performance of ventures (Abubakar et al, 2019; Alwhawamdeh and Alsmairat, 2019).

According to our findings, grants have a moderating effect on the relationship between digital leadership competency and innovation in business models as a result of managerial decisions. In the early stages of their development, startups might secure non-repayable grants to fund operational costs. By providing resources and validating business concepts, new ventures can reduce financial risk. Grants not only provide access to financials but also come with networking opportunities, mentorship, and other facilities. As grants do not have strings attached, thereby, it gives the managers greater flexibility in terms of decision-making, as grants do not come with any kind of obligations for new ventures.
However, we see from our results that new ventures need to dedicate resources and put more efforts towards the development of digital leadership capabilities and improving managerial decision-making than obtaining grants, therefore, special efforts should not be put into raising grants. Whereas grants do have a positive aspect in terms of the provision of funding, however, efforts invested toward enhancing digital leadership and managerial decision-making skills can be more fruitful for new ventures.

Theoretical implication

The theoretical contributions of the study are threefold. Firstly, the current study finds the existence of a direct and positive relationship between digital leadership capabilities and business model innovation, thereby demonstrating how digital leadership capabilities besides having capabilities for enhancement of organizational performance (Chatterjee, Chaudhuri, Vronti and Giovando, 2023) and innovation performance (Benitez et al., 2022), is significant for business model innovation as well. Our findings enrich the dynamic capabilities theory literature by reflecting that distinctive dynamic capabilities (digital leadership capabilities and managerial decision-making) can favour the business models in new ventures providing them long-lasting competitive advantages, specifically in high-velocity markets (turbulent environments).

Secondly, our study empirically advances the literature by providing evidence on digital leadership capability and managerial decision-making as a source of competitive advantage that enhances innovation within new ventures. We argued that new ventures' human resources, managers, and their decision-making skills enable new ventures to translate leaders' valuable digital skills into enhanced business model innovation. Moreover, managers with high decision-making skills enable new ventures to extract valuable knowledge enabling the new ventures to remain updated on the market transformations, exploit the new trends in technology by adapting in order to improve competitiveness, and introduce new products/services and business models (revenue streams and pricing mechanisms). Our results extend the DCV literature by demonstrating a positive mediating effect of higher-order managerial decision-making, in the relationship between digital leadership capability and business model innovation.

Thirdly, our results contribute to the literature by reflecting the significance of grants in the innovation of new ventures. This study reflects that grants can play an integral role for the new ventures to come up with new products and services and enable better decision-making within the new ventures. New ventures that secure higher grants are more likely to be innovative in the dimensions of value creation, value delivery, and value capture which is highly needed in the digital realm. Research and development grants tend to impact the innovation within firms in a positive a significant manner and facilitate the firms to gain desired market growth targets and remain competitive.

Practical Implications

From a managerial point of view, our results suggest that digital leadership capabilities amongst the leaders are integral for new venture business model innovation and leaders need to invest in digital-specific leadership development programs that provide executives with the knowledge and skills they need to succeed in emerging technologies, data analytics, and digital strategy. Moreover, new ventures aiming to make a difference in the digital space shall focus on improving their leaders' digital capabilities as in an era marked by technology disruption, encouraging innovation in business models can enable firms to stay adaptable, competitive, and resilient. Furthermore, it is critical to encourage experimentation, learning, and adaptability as leaders in the digital space should foster a culture that rewards calculated risk-taking and sees failure as an opportunity for growth.

Moreover, training needs to be arranged for the managers to enhance their decision-making skills by the concerned stakeholders including but not limited to incubation/acceleration centres, relevant institutes, government entities, and non-government organizations to help build managerial skills necessary for a competitive environment. When founders are looking for managers, they should look for decision-making skills to focus more on innovation. Managers with the right skills can navigate new ventures through turbulence by improving different elements of the business and also bringing radical innovation to gain competitive advantage.

We suggest that entities that are involved in facilitating the new ventures should provide grants to the new ventures to boost their innovativeness and better managerial decision-making. It requires a deeper understanding on the part of all stakeholders that to scale up and to bring novel solutions, new ventures need internal and external funding. Furthermore, governments, especially of developing countries, should also derive such a policy that facilitates the new ventures in securing grants both nationally and internationally for continuous experimentation and pursual of the growth strategy.

Conclusion

This research emphasizes the critical significance of digital leadership capabilities in promoting business model innovation. The findings emphasize the importance of firms developing and leveraging these capabilities in order to successfully traverse the challenges of the digital era. Understanding and applying digital leadership concepts becomes a vital engine of ongoing innovation and competitive advantage as leaders adjust to the changing landscape.

The empirical evidence in this study supports the notion that digital leadership capability has an influence on managerial decision making which in turn fosters conducive environment for business model innovation. Managerial acumen tends to have a critical role in translating digital leadership into business outcomes. The mediation mechanism provides valuable insights for companies that focus on optimizing innovation. This understanding empowers the companies to foster leadership practices that are not only focused on technological advancements but also are a guidance for the decision makers to shape innovative business models in dynamic business environment.

Lastly, our study highlighted significant role that grants play as the moderator. Grants tend to be an influencer in the interplay between digital leadership and business model innovation through managerial decision-making. However, new ventures can drive on the road of business model innovation with or without grants. Whereas grants do contribute towards financial rewards for the new ventures but dedicated efforts should be more focused towards the development of digital leadership capabilities and managerial decision-making rather than grants as this can turn out to be more beneficial for the new ventures.

Limitations and Future Research

There are some limitations of the current study which may act as the starting point for future studies. The study is survey-based and since the data was collected online, therefore, it has been challenging for the researcher to establish a sampling frame. For example, it is not known exactly how many potential respondents read the survey sent to them. Adding to this, the study is country-specific, as the data has been collected from Pakistan therefore this limits the generalizability of the results that are obtained. The country-specific characteristics might have influenced the results of the study along with the size of the impact of the variables. It is recommended that future research work perform a cross-country analysis which will assist in verifying the findings of the current study and validate the same for other national economic settings. A comparative study can be carried out by collecting data from another country and the sustainability issues can be highlighted and examined if they impact business model innovation. This is crucial as Pakistan is strongly being impacted due to climate change (Annie, Niko and Aiyna, 2023). Shifting the focus towards a comparative study provides the opportunity to generalize findings and provides broader conclusions as well.

Furthermore, the influence of female founding team members can be analyzed as a driver for business model innovation which will contribute to the growing body of knowledge on diversity and innovation. We have seen in past studies that women in top management contribute towards better firm performance and open innovation (Tahir et al., 2021), therefore, it is crucial to examine the impact of female founding team members for new ventures in the given context.

Moreover, our study includes profitability, education, experience, and number of women founders as the control variables for the study, however, we believe that all the contextual differences impacting the relationships in our conceptual model are not covered by these. This is an opportunity to include other control variables in future studies that are potentially significant which include but are not limited to firm size and firm revenue. Further studies may introduce other dynamic capabilities that impact business model innovation, and the current study limits itself to digital leadership capability and managerial decision-making as the dynamic capabilities for business model innovation. Pursuing the said suggestions for future research, could further enhance the understanding of the relationship of digital leadership capabilities and business model innovation.

References

Abubakar, A.M., Elrehail, H., Alatailat, M.A. and Elçi, A., 2019. Knowledge management, decision-making style and organizational performance. *Journal of Innovation & Knowledge*, *4*(2), pp.104-114.

Aharoni, Y., Tihanyi, L., and Connelly, B. L. (2011), "Managerial decision-making in International Business: A forty-five-year retrospective", *Journal of World Business*, Vol. 46 No. 2, pp.135–142.

Ahmed, A., Khurshid, M.K., Riaz, Z., Nasir, N. and Aslam, M.A. (2022), "Business model innovation, digital organizational culture, and bank performance: The role of digital technologies and top management mindfulness", *Journal of Management Info*, Vol. 9 No. 2, pp. 262–283.

AlAjmi, M. K. (2022), "The impact of digital leadership on teachers' technology integration during the COVID-19 pandemic in Kuwait", *International Journal of Educational Research*, Vol. 112, p.101928.

Alexandre, F., Chaves, M., and Portela, M. (2022), "Investment grants and firms' productivity: How effective is a grant booster shot?" *SSRN Electronic Journal*.

Alhawamdeh, H. M., and Alsmairat, M. A. K. (2019), "Strategic decision making and organization performance: A literature review", *International Review of Management and Marketing*, Vol.9 No.4, pp.95–99.

Ancillai, C., Sabatini, A., Gatti, M., and Perna, A. (2023), "Digital Technology and business model innovation: A systematic literature review and future research agenda", *Technological Forecasting and Social Change*, Vol.188, p.122307.

Annie Gowen, Niko Commend and aiyna Bashir (2023) *Pakistan bears the brunt of global extreme heat ... - The Washington Post*. Available at: https://www.washingtonpost.com/climate-environment/interactive/2023/pakistan-extreme-heat-health-impacts-death/ (Accessed: 23 December 2023).

Antolín-López, R., Céspedes-Lorente, J., García-de-Frutos, N., Martínez-del-Río, J., and Pérez-Valls, M. (2015). Fostering product innovation: Differences between new ventures and established firms. *Technovation*, *41*, pp.25-37.

Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, Vol.14 No.3, pp.396–402

Asad, M., Asif, M.U., Bakar, L.J.A. and Sheikh, U.A. (2021), "Transformational leadership, sustainable human resource practices, sustainable innovation and performance of SMEs", presented at the 2021 International Conference on Decision Aid Sciences and Application (DASA), IEEE, pp. 797–802.

Azar, O. H. (2021). "Risk and prior outcome effects on Managerial Decision making", *Journal of Behavioral and Experimental Economics*, Vol.95, p.101775.

Barba-Sánchez, V., and Atienza-Sahuquillo, C. (2012), "Entrepreneurial behavior: Impact of motivation factors on decision to create a new venture", *Investigaciones Europeas De Dirección y Economía De La Empresa*, Vol.18 No.2, pp.132–138.

Bashir, M., Alfalih, A., and Pradhan, S. (2023), "Managerial ties, Business Model Innovation and SME Performance: Moderating role of environmental turbulence", *Journal of Innovation and Knowledge*, Vol 8 No.1, p.100329.

Bashir, M., & Verma, R. (2017). Why business model innovation is the new competitive advantage. *IUP Journal of Business Strategy*, Vol 14 No.1, p.7.

Behrens, J. (2015), "A lack of insight: An experimental analysis of RandD managers' decision making in Innovation Portfolio Management", *Creativity and Innovation Management*, Vol.25 No.2, pp.239–250.

Benitez, J., Arenas, A., Castillo, A., and Esteves, J. (2022), "Impact of digital leadership capability on innovation performance: The role of platform Digitization Capability", *Information and Management*, Vol 59 No.2, p.103590.

Berman, S.J., (2012), "Digital transformation: opportunities to create new business models", *Strategy and Leadership*, Vol. 40 No. 2, pp.16–24.

Bersin, J. (2017), "Digital Leadership is not an optional part of being a CEO", Harvard Business Review, available at: https://hbr.org/2016/12/digital-leadership-is-not-an-optional-part-of-being-a-ceo

Borah, P. S., Iqbal, S., and Akhtar, S. (2022), "Linking social media usage and SME's sustainable performance: The role of Digital Leadership and Innovation Capabilities", *Technology in Society*, 68, p.101900.

Bouwman, H., Nikou, S. and de Reuver, M., 2019. Digitalization, business models, and SMEs: How do business model innovation practices improve performance of digitalizing SMEs?. *Telecommunications Policy*, *43*(9), p.101828.

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., ... and Walker, K. (2020), "Purposive sampling: complex or simple? Research case examples", *Journal of research in Nursing*, Vol. 25 No.8, pp.652-661.

Cao, Z., and Shi, X. (2020), "A systematic literature review of entrepreneurial ecosystems in advanced and emerging economies", *Small Business Economics*, Vol.57 No.1, pp.75–110.

Caputo, A., Pizzi, S., Pellegrini, M.M. and Dabić, M., 2021. Digitalization and business models: Where are we going? A science map of the field. *Journal of business research*, *123*, pp.489-501.

Chatterjee, S., and Kar, A. K. (2018), "Regulation and governance of the Internet of Things in India", *Digital Policy, Regulation and Governance*, Vol.20 No.5, pp.399-412.

Chatterjee, S., Chaudhuri, R., Vrontis, D., and Giovando, G. (2023), "Digital Workplace and organization performance: Moderating role of Digital Leadership Capability", *Journal of Innovation and Knowledge*, Vol.8 No.1, p.100334.

Chatterjee, S., Chaudhuri, R., and Vrontis, D. (2022), "Knowledge sharing in international markets for product and process innovation: moderating role of firm's absorptive capacity", *International Marketing Review*, Vol.39 No.3,pp.706-733.

Chatterjee, S., Rana, N. P., and Dwivedi, Y. K. (2021), "How does business analytics contribute to organisational performance and business value? A resource-based view", *Information Technology and People*.

Chesbrough, H., 2011. *Open services innovation: Rethinking your business to grow and compete in a new era*. John Wiley & Sons.

Chong, A.Y.L., Lim, E.T., Hua, X., Zheng, S. and Tan, C.W., 2019. Business on chain: A comparative case study of five blockchain-inspired business models. *Journal of the Association for Information Systems*, *20*(9), p.9.

Ciampi, F., Demi, S., Magrini, A., Marzi, G., and Papa, A. (2021). "Exploring the impact of big data analytics capabilities on Business Model Innovation: The mediating role of Entrepreneurial Orientation", *Journal of Business Research*, Vol. 123, pp.1–13.

Collins, D. (2003), "Quality of Life Research", Vol.12 No.3, pp. 229–238.

Daugherty, P., Ghosh, B., Rippert, A., Venkataraman, R. and Wilson, H.J. (2021), "Make the leap, take the lead".

Dost, M., Badir, Y.F., Ali, Z. and Tariq, A. (2016), "The impact of intellectual capital on innovation generation and adoption", *Journal of Intellectual Capital*, Emerald Group Publishing Limited.

Delbecq, A. L., and Mills, P. K. (1985), "Managerial practices that enhance innovation", *Organizational Dynamics*, Vol.14 No.1, pp.24–34.

Delice, A. (2010), “The Sampling Issues in Quantitative Research”, *Educational Sciences: Theory and Practice*, Vol.10 No.4, pp.2001-2018.

Dvouletý, O., Srhoj, S., and Pantea, S. (2020), “Public SME grants and firm performance in European Union: A systematic review of empirical evidence”, *Small Business Economics*, Vol.57 No.1, pp.243–263.

Eisenberg, D. (2021), “What's fueling Pakistan's emerging start-up Ecosystem”, McKinsey and Company, available at: https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/whats-fueling-pakistans-emerging-start-up-ecosystem

Eisenhardt, K. and Zbaracki, M. (1992), “Strategic Decision Making”, *Strategic Management Journal*, Vol.13, pp.17–37.

Erhan, T., Uzunbacak, H. H., and Aydin, E. (2022), “From conventional to digital leadership: Exploring digitalization of leadership and innovative work behavior”, *Management Research Review*, Vol.45 No.11, pp.1524–1543.

Evers, N., and Andersson, S. (2021), “Predictive and effectual decision-making in high-Tech International New Ventures – A matter of sequential ambidexterity”, *International Business Review*, Vol.30 No.1, p.101655.

Frimodig, L. and Torkkeli, M. (2017), “Sources for success-new venture creation in seed and business accelerators”, *International Journal of Business Excellence*, Inderscience Publishers (IEL), Vol. 12 No. 4, pp. 489–507.

Fitzgerald, M., Kruschwitz, N., Bonnet, D., & Welch, M. (2014). Embracing digital technology: A new strategic imperative. *MIT sloan management review*, Vol.55 No.2, p.1.

Forth, P., Reichart, T., Laubier, R. D., and Chakraborty, S. (2020). “Flipping the odds of digital transformation success”,BCG Global, Available at: https://www.bcg.com/publications/2020/increasing-odds-of-success-in-digital-transformation.

Gavetti, G., and Levinthal, D. A. (2004), “50th Anniversary article: The strategy field from the perspective of Management Science: Divergent strands and possible integration”, *Management science*, Vol.50 No.10, pp.1309-1318.

Groves, R. M., & Peytcheva, E. (2008). The impact of nonresponse rates on nonresponse bias: A meta-analysis. Public Opinion Quarterly, 72(2), 167-189.

Haider, S.H., Asad, M. and Fatima, M. (2017), “Entrepreneurial orientation and business performance of manufacturing sector small and medium scale enterprises of Punjab Pakistan”, *European Business and Management*, Vol. 3 No. 2, pp. 21–28.

Hair, J. F., Ringle, C. M., and Sarstedt, M. (2011), “PLS-SEM: Indeed a silver bullet”, *Journal of Marketing theory and Practice*, Vol.19 No.2, pp.139-152.

Hearsum, S. (2015). How to develop digital leadership capability. *Strategic HR Review*.

Heubeck, T. (2023), “Managerial capabilities as facilitators of Digital Transformation? dynamic managerial capabilities as antecedents to digital business model transformation and firm performance”, *Digital Business*, Vol.3 No.1,p.100053.

Hong, J., Feng, B., Wu, Y., and Wang, L. (2016), “Do government grants promote innovation efficiency in China's high-tech industries?”, *Technovation*, Vol.57, pp.4–13.

Howell, S. T. (2017), “Financing innovation: Evidence from RandD grants”, *American Economic Review*, Vol.107 No.4,pp.1136–1164.

Islam, T., Ahmad, S., and Ahmed, I. (2022), “Linking environment specific servant leadership with organizational environmental citizenship behavior: the roles of CSR and attachment anxiety”, *Review of Managerial Science*, pp.1-25.

Ismail, S.M., (2023). Assessing the Impact of Organizational Conflict Management Styles on Decision-Making in EGYPTAIR Airlines. *Minia Journal of Tourism and Hospitality Research MJTHR*, *15*(3), pp.29-52.

Jiang, H., Yang, J. and Gai, J. (2023a) 'How digital platform capability affects the innovation performance of smes—evidence from China', *Technology in Society*, 72, p. 102187. doi:10.1016/j.techsoc.2022.102187.

Junaid, M., Nazir, S. and Ali, M. (2023), "Role of Blockchain Technology Adoption between Sustainability Related Supply Chain Risks and Triple Bottom Line Performance", *Blockchain Driven Supply Chain Management: A Multi-Dimensional Perspective*, Springer, pp. 181–199.

Kane, G. C., Phillips, A. N., Copulsky, J., and Andrus, G. (2019). How digital leadership is (n't) different. *MIT Sloan Management Review, Vol 60 No 3, pp.*34-39

Kunc, M. H., and Morecroft, J. D. (2010), "Managerial decision making and firm performance under a resource-based paradigm", *Strategic Management Journal*, Vol.31 No.11, pp.1164–1182.

Latifi, M.-A., Nikou, S. and Bouwman, H. (2021), "Business model innovation and firm performance: Exploring causal mechanisms in SMEs", *Technovation*, Elsevier, Vol. 107, p. 102274.

Laskovaia, A., Marino, L., Shirokova, G., and Wales, W. (2018), "Expect the unexpected: Examining the shaping role of entrepreneurial orientation on causal and effectual decision-making logic during economic crisis", *Entrepreneurship and Regional Development*, Vol.31 No.5-6, pp.456–475.

Lawler, E. and Boudreau, J.W. (2009), *Achieving Excellence in Human Resources Management: An Assessment of Human Resource Functions*, Stanford University Press.

Lee, J., Suh, T., Roy, D. and Baucus, M., 2019. Emerging technology and business model innovation: the case of artificial intelligence. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(3), p.44.

Li, W., Liu, K., Belitski, M., Ghobadian, A. and O'Regan, N. (2016), "e-Leadership through strategic alignment: An empirical study of small-and medium-sized enterprises in the digital age", *Journal of Information Technology*, Springer, Vol. 31, pp. 185–206.

Le, T. and Jaffe, A.B. (2016), "The impact of RandD subsidy on innovation: Evidence from New Zealand firms," *Economics of Innovation and New Technology*, Vol.26 No.5, pp. 429–452.

Lee, J., and Chung, J. (2022), "Women in top management teams and their impact on Innovation", *Technological Forecasting and Social Change*, Vol.183, p.121883.

Leinwand, P., and Mani, M. M. (2021), "Digitizing isn't the same as digital transformation", *Harvard Business Review*, Vol.26.

Li, S., and Fu, T. (2022), "Abatement technology innovation, worker productivity and firm profitability: A dynamic analysis", *Energy Economics*, Vol.115, p.106369.

Lim, T., Tang, T., and Bowen, W. M. (2021), "The impact of intergovernmental grants on innovation in Clean Energy and Energy Conservation: Evidence from the American Recovery and Reinvestment Act", *Energy Policy*, Vol.148, p.111923.

Lin, Y., and Wu, L.-Y. (2014), "Exploring the role of dynamic capabilities in firm performance under the resource-based View Framework", *Journal of Business Research*, Vol.67 No.3, pp.407–413.

Li, S., and Fu, T. (2022), "Abatement technology innovation, worker productivity and firm profitability: A dynamic analysis", *Energy Economics*, Vol.115, p.106369.

Majali, T., Alkaraki, M., Asad, M., Aladwan, N. and Aledeinat, M. (2022), "Green transformational leadership, green entrepreneurial orientation and performance of SMEs: The mediating role of green product innovation", *Journal of Open Innovation: Technology, Market, and Complexity*, MDPI, Vol. 8 No. 4, p. 191.

Majid, F., Raziq, M.M., Memon, M.A., Tariq, A. and Rice, J.L. (2023), “Transformational leadership, job engagement, and championing behavior: assessing the mediating role of role clarity”, *European Business Review*, Emerald Publishing Limited.

Marvel, M. R., Wolfe, M. T., and Kuratko, D. F. (2020), “Escaping the knowledge corridor: How founder human capital and founder coachability impacts product innovation in new ventures”, *Journal of Business Venturing*, Vol.35 No.6,p.106060.

Mehmood, M.S., Jian, Z., Akram, U. and Tariq, A. (2021), “Entrepreneurial leadership: The key to develop creativity in organizations”, *Leadership & Organization Development Journal*, Emerald Publishing Limited.

Mihardjo, L. W., Sasmoko, S., Alamsyah, F., and Elidjen, E. (2019), “The influence of digital leadership on innovation management based on Dynamic Capability: Market Orientation as a moderator”, *Management Science Letters*, pp.1059–1070.

Mihardjo, L. W. W., Sasmoko, S., Alamsjah, F., and Elidjen, E. (2019), “Digital leadership role in developing business model innovation and customer experience orientation in industry 4.0”, *Management Science Letters*, pp.1749–1762.

Mikalef, P., Boura, M., Lekakos, G., and Krogstie, J. (2019), “Big Data Analytics capabilities and innovation: The mediating role of dynamic capabilities and moderating effect of the environment”, *British Journal of Management*, Vol.30 No.2, pp.272–298.

Miller, A., and Camp, B. (1985), “Exploring determinants of success in Corporate Ventures”, *Journal of Business Venturing*, Vol.1 No.1, pp.87–105.

Molina-Castillo, F.-J. *et al.* (2022) ‘The role of ERP in business model innovation: Impetus or impediment’, *Digital Business*, 2(2), p. 100024. doi:10.1016/j.digbus.2022.100024.

Molly, V., Uhlaner, L. M., De Massis, A., & Laveren, E. (2018). Family-centered goals, Family Board representation, and debt financing. *Small Business Economics*, *53*(1), 269–286. https://doi.org/10.1007/s11187-018-0058-9

Njanja, A. (2022), “NayaPay secures $13 million, largest seed funding in South Asia for its messaging and payment app”, 24 February.

Nagel, L. (2020), “The influence of the COVID-19 pandemic on the digital transformation of work”, *International Journal of Sociology and Social Policy*, Vol.40 No.9-10, pp.861-875.

Nauhaus, S., Luger, J., and Raisch, S. (2021), “Strategic decision making in the digital age: Expert sentiment and Corporate Capital Allocation”, *Journal of Management Studies*, Vol.58 No.7, pp.1933–1961.

Nazir, S. and Yu, Z. (2023), “Sustainable Belt and Road (OBOR) Development: A Case of the China-Pakistan Economic Corridor”, *Emerging Trends in Sustainable Supply Chain Management and Green Logistics*, IGI Global, pp. 229–266.

Njanja, A. (2022), “NayaPay secures $13 million, largest seed funding in South Asia for its messaging and payment app”, 24 February.

Pandey, J. *et al.* (2023) ‘Role of digital leadership capability in shaping it innovation’, *Journal of Global Information Management*, 31(8), pp. 1–20. doi:10.4018/jgim.333168.

Remišová, A., and Lašáková, A. (2014), “CSR-related managerial decision-making preferences in the CEE region (results of the Globe Student Research)”, *Procedia - Social and Behavioral Sciences*, Vol.110, pp.913–922.

Rodriguez-Ardura, I., and Meseguer-Artola, A. (2020), “How to prevent, detect and control common method variance in electronic commerce research”, *Journal of theoretical and applied electronic commerce research*, Vol.15 No.2,pp.1-5.

Safdar, U., Tariq, A., Saudagar, T. and Razzaq, R. (2019), “Inclusive leadership and creative self-efficacy: Testing the moderating and mediating mechanisms”, Vol. 2019, presented at the Academy of Management Proceedings, Academy of Management Briarcliff Manor, NY 10510, p. 17550.

Samson, K. (2018). Human capital analytics: Exploring a contingency model of executive decision making effectiveness, human resource capabilities, organisation culture and organisational performance. *Doctoral Thesis*. Charles Sturt University, Australia.

Samson, K. and Bhanugopan, R. (2022), "Strategic human capital analytics and organisation performance: The mediating effects of managerial decision-making", *Journal of Business Research*, Elsevier, Vol. 144, pp. 637–649.

Schwarzmüller, T., Brosi, P., Duman, D., and Welpe, I. M. (2018), "How does the digital transformation affect organizations? Key themes of change in work design and leadership", *Management Revue*, Vol.29 No.2, pp.114-138

Shinkle, G. A., and Suchard, J.-A. (2018), "Innovation in newly public firms: The influence of government grants, venture capital, and private equity", *Australian Journal of Management*, Vol.44 No.2, pp.248–281.

Sia, S. K., Soh, C., and Weill, P. (2016), "How DBS Bank Pursued a Digital Business Strategy", *MIS Quarterly Executive*, Vol.15 No.2.

StartupBlink. (2023), "Global startup ecosystem report 2023", Available at: https://www.startupblink.com/startupecosystemreport2023.pdf

Startup genome. (2022), "The global startup ecosystem report 2022", Available at: https://startupgenome.com/articles/the-state-of-global-startup-ecosystems-in-2022.

The News. (2018), "Alibaba acquires Daraz in estimated $200 million deal", 9 May.

Tahir, S.H., Ullah, M.R., Ahmad, G., Syed, N. and Qadir, A., 2021. Women in top management: Performance of firms and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), p.87.

Tariq, A., Ehsan, S., Badir, Y.F., Memon, M.A. and Khan Sumbal, M.S.U. (2023), "Does green process innovation affect a firm's financial risk? The moderating role of slack resources and competitive intensity", *European Journal of Innovation Management*, Emerald Publishing Limited, Vol. 26 No. 4, pp. 1168–1185.

Teece, D. J. (2016), "Dynamic capabilities and entrepreneurial management in large organizations: Toward a theory of the (entrepreneurial) firm", *European Economic Review*, Vol.86, pp.202–216.

Teece, D. J., Pisano, G., and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol.18 No.7, pp.509–533.

Tingvall, P. G., and Videnord, J. (2018), "Regional differences in effects of publicly sponsored RandD grants on SME Performance", *Small Business Economics*, Vol.54 No.4, pp.951–969.

Telecom indicators | PTA - Pakistan Telecommunication Authority. PTA. (2023), Available at: https://www.pta.gov.pk/en/telecom-indicators

Temel, S., Mention, A.-L. and Torkkeli, M. (2013), "The impact of cooperation on firms' innovation propensity in emerging economies", *Journal of Technology Management & Innovation*, SciELO Chile, Vol. 8 No. 1, pp. 54–64.

TheNews. (2018), "Alibaba acquires Daraz in estimated $200 million deal", 9 May.

Wang, X., Li, Y., Tian, L., and Hou, Y. (2023), "Government Digital Initiatives and firm Digital Innovation: Evidence from China", *Technovation*, Vol.*119*, p.102545.

Weill, P., Woerner, S., and Shah, A. (2021), "Does your C-suite have enough digital smarts?" MIT Sloan Management Review, Available at: https://sloanreview.mit.edu/article/does-your-c-suite-have-enough-digital-smarts/

Westerman, G., Tannou, M., Bonnet, D., Ferraris, P., and McAfee, A. (2012), "The Digital Advantage: How digital leaders outperform their peers in every industry", *MITSloan Management and Capgemini Consulting, MA*, Vol.*2*, pp.2-23.

Yu, Z., Shah, A., Rehman, S.A., Nazir, S. and Tanveer, M. (2022), "Blockchain Technology and Sustainable Supply Chain Practices: Leading Towards Organizational Performance", *Journal of Advanced Manufacturing Systems*, World Scientific.

Yue, Q. (2022), "Bilateral matching decision-making for knowledge innovation management considering matching willingness in an interval intuitionistic fuzzy set environment", *Journal of Innovation and Knowledge*, Vol.7 No.3, p.100209.

Zott, C., Amit, R., and Massa, L. (2011), "The business model: recent developments and future research", *Journal of management*, Vol.37 No.4, pp.1019-1042.

Figures

Figure II.

Managerial decision making as a function of Digital leadership capability and Grants

Tables

Table I.

Demographic Information

Characteristic	Frequency	Percent
Gender		
Male	260	83.1
Female	53	16.9
Province		
Punjab	123	39.2
Islamabad Capital Territory	48	15.3
Khyber Pakhtunkhwa	49	15.6
Sindh	75	23.9
Baluchistan	6	1.9
Gilgit Baltistan	11	3.5
AJK	1	0.3
Education of founder/co-founder		
Intermediate	7	2.2
Bachelors	172	55.0
Masters	118	37.7
Doctorate	7	2.2
Diploma	1	.3
Others	8	2.6
Female founder		
0	211	67.4
1	71	22.7
2	23	7.3
3	5	1.6

4	1	.3
5	2	.6
Size of Venture		
<=5	91	29.1
6-10	81	25.9
11-15	50	16.0
16-20	25	8.0
21-25	15	4.8
26-30	4	1.3
Above 30	47	15.0
Founder's Experience		
No experience	7	2.2
Less than 1 year	19	6.1
1-3 years	58	18.5
4-6 years	92	29.4
7-9 years	45	14.4
10 years and above	92	29.4
New venture Profitability		
Yes	222	70.9
No	91	29.1

Table II.

Scale, Sample items, CITC and number of items

Scale (Cronbach)	**Indicators**	**Sample items**	**Adapted from**	**Standardised factor loadings**	**CITC**	**AVE**	**CR**
Digital Leadership Capability (Cronbach Alpha = .876)	DLC1 DLC2 DLC3 DLC4	· We have sufficient internal staff members who have the skills to exploit new IT trends · We have sufficient internal staff members who have the skills to innovate strategic business and operating models, and	Benitez et al (2022)	0.688 0.732 0.813 0.711	0.450 - 0.603	0.57	0.996

		envision and drive change for business performance via technology					
Manageria l Decision Making (Cronbach Alpha = .891)	MDM1 MDM2 MDM3 MDM4 MDM5 MDM6 MDM7	· I understand and use sound principles when making decisions about Motivation · I understand and use sound principles when making decisions about culture	Samson and Bhanugopa n (2022)	0.682 0.570 0.729 0.729 0.695 0.605 0.574	0.488 - 0.639	0.74 4	2.65 6
Business Model Innovation (Cronbach Alpha = .880)	BDI1 BDI2 BDI3 BDI4 BDI5 BDI6	· Our new venture introduced new products/ser vices as a new value proposition · Our new venture focused on a completely new market segment	Latifi, Nikou and Bouwman (2021)	0.780 0.780 0.799 0.615 0.661 0.503	0.23- 0.580	0.54	5.86

Table III.
Descriptive statistics and Pearson's Correlations between variables

	Mean	S.D.	1	2	3	4	5	6	7
Digital Leadership Capability	3.614	0.963							
Business Model Innovation	3.659	0.813	.368**						
Managerial Decision Making	4.041	0.702	.387**	.397**					
Grants	0.207	0.406	0.046	.100*	0.007				
Venture profitability	0.709	0.454	.102*	0.079	.163**	0.085			
Professional Experience	3.357	1.351	.095*	.114*	0.027	-0.042	0.06		
Education	2.51	0.816	-0.042	.132**	-0.002	0.027	0.056	.316**	
Female Founding team member	0.466	0.812	-0.055	-0.059	-0.043	.127**	-0.031	0.058	.219**

**p<0.01, *p<0.05

Table IV.
Direct and Indirect Effect

	Managerial Decision Making		Business Model Innovation	
Direct Effects	*B*	*SE*	*B*	*SE*
Digital Leadership Capability	.2742*** [.1984;.3499]	0.0385	.2032*** [.1122;.2942]	0.0462
Managerial Decision Making			.3484*** [.2235;.4733]	0.0635
Grants	-1.1024** [-1.8383; -.3665]	0.374		
Control Variables				
Education	.0154 [-.0800;.1108]	0.0485	.1439**[.0378;.2501]	0.054
Female founding member	-.0183 [-.1093;.0728]	0.0463	-.0677 [-.1690;.0337]	0.0515
Venture profitability	.1915* [.0318;.3512]	0.0812	-.0122 [-.1914;.1671]	0.0911
Professional experience	-.0108 [-.0674;.0458]	0.0287	.0253 [-.0376;.0882]	0.032
Total R^2	0.1661		0.2329	
Indirect effect using Bootstrap			.0955 [.0500;.1481]	0.0244

*Confidence Interval = 95%, 5000 bootstrap samples, N=313, *** p<0.00, **p<0.01, *p<0.05

Table V.

Moderated mediation analysis

	Managerial Decision Making			Business Model Innovation		
	Coeff	SE	95% CI	Coeff	SE	95% CI
Control Variables						
Education	0.0166	0.048	[-.0778;.1109]	.1439**	0.054	[.0378;.2501]
Female founding member	-0.0126	0.0465	[-.1041;.0789]	-0.0677	0.0515	[-.1690;.0337]
Venture profitability	.1848*	0.0807	[.0261;.3436]	-0.0122	0.0911	[-.1914;.1671]
Professional experience	-0.0078	0.0285	[-.639;.0483]	0.0253	0.032	[-.0376;.0882]
Conditional Effect of focal predictor						
No Grants	.2234***	0.042	[.1408;.3059]			
Grants raised	.5138***	0.0896	[.3374;.6901]			
Conditional indirect effect of X on Y						
No grants	0.0778	0.0217	[.0395;.1240]			
Grants raised	0.179	0.0511	[.0824;.2818]			
Index of moderated mediation						
	Index: .1012	0.0454	[.0164;.1929]			

*Confidence Interval = 95%, 5000 bootstrap samples, N=313, *** p<0.001, **p<0.01, *p<0.05