

# **Examining the Microfoundations for Digital Business Model Innovation of Developing Markets International New Ventures (INVs)**

## **ABSTRACT**

This paper explores micro-foundations for digital business model innovation. This is pertinent because little is known regarding how decision-makers manage the digitalization processes that require business model innovation. Building on dynamic capability and upper echelon theories, this paper sheds light on the dynamic capability driven antecedents of the digital business model innovation of developing market international new ventures (INVs). Using survey data from 145 Pakistani INV, the study reports that internet capabilities (platform and web capabilities) positively influence digital business model innovation. The direct influences are mediated by strategic agility and moderated by the functional diversity of the top management team (TMT). The influence of strategic agility on the digital business innovation model is also positively moderated by TMT's functional diversity. The findings contribute to the nascent literature on antecedents for the digital business model innovation in an under-explored context of developing market INVs. Practical and policy related implications are also discussed.

**Keywords:** *Digital business model innovation; strategic agility; platform capability; web capability; top management functional diversity.*

# **Examining the Micro-foundations for Digital Business Model Innovation of a Developing Market International New Ventures**

## **1. INTRODUCTION**

The digitalization and emergence of innovative technologies have transformed the competitive landscape of industries globally [1]. The technological revolution has compelled firms to rejuvenate their ways of developing their offerings and doing business [2]. These technological shifts have also led firms to adopt digital business model innovation (*hereafter, digital BMI*) [3]. Digital BMI is defined as 'a change in how firms adopt digital technologies to develop a new business model that helps create positive value' [4]. Despite this being a pertinent case in the context of internationalization [5], the micro-foundations for the digital BMI for the developing market international new ventures (INVs) seeking growth in the foreign markets have received limited scholarly attention.

Micro-foundations are explained as *skills and knowledge from the perspective of individuals, processes, or firms' functional structures that are crucial for firms' performance* [6]. Take Pakistan, the context of this study, as an example where trade deficit is approximately USD 31 billion [7]. Pakistani INVs (e.g., exporting firms) require unique dynamic capabilities and skills to enhance performance in host markets [8-10]. Due to the digital transition in foreign markets, these firms face immense pressure in adopting digital BMI, which may require certain dynamic capabilities. Scholars have examined the factors influencing the strategic agility of multinational enterprises in emerging markets [11], yet there is a gap in understanding the antecedents of digital BMI of INVs from developing markets. This is an important gap to address, given that many INVs are inclined towards adopting digitalized value creation and revenue generating mechanisms [12]. Against these aforementioned practical concerns and theoretical gaps, the overarching objective of this study is to *explore the microfoundations of*

*dynamic capabilities required for digital BMIs for the developing market INVs.* Though DC is not the variable of investigation in this study, we consider generic DCs as a backend mechanism enabling other specific capabilities to address the changing environment. For instance, we examine platform capability, web capability and strategic agility as DCs enabled capabilities. This is consistent with Teece (2007) the DCs and DCs driven capabilities influence each other. Prior work on the current context has mostly ignored the contextualized firms' operations, e.g., INVs [13]. To our knowledge, this is the first few studies to consider the microfoundations of dynamic capabilities required for digital BMI in developing market INVs context. This is important to understand in the context of a developing market's INVs as it would allow mitigating issues such as liability of foreignness as well as newness [14]. While Bendig, et al. [15] study examines the interaction of dynamic individual and organizational capabilities, there is a gap to examine the dynamic internet capabilities in the context of INVs' . Specifically, we examine the interaction of DCs enabled specific capabilities with managerial functional diversity to enhance the digital BMI.

Digital transformation requires key capabilities which can assist in digital BMI and success in international markets [16]. Prior studies have considered digital BMIs from various aspects. For example, Nasiri, et al. [17] examines the adoption of smart technologies for enhancing performance. Another study has considered examining the role of absorptive capacity [18]. However, scant attention has been given to understanding the efficacy of *platform and web capabilities* in digital BMI. Platform capability is defined as *the ability to use various functions and services offered by platforms for matching, aggregating, information sharing and communicating in foreign markets* [19]. In contrast, web capability is defined as the *ability to publish, interact and improve the processes for foreign customers* [20]. Recent studies have examined the role of platform capabilities in value creation activities, such as live-streaming platforms [21] and micro-tasking [22]. Despite the relevance of web and platform capabilities

for effective cross-border operations [2], their influence on digital BMI has largely remained ignored. Moreover, the influence of these capabilities on BMI may not be straightforward. For example, the aggregation and information sharing functions help in proactive and timely sensing and responding to foreign markets [23]. Hence, drawing from DC theory [24], it can be argued that these internet capabilities help develop international strategic agility, defined as a proactive strategy of market sensing and achieving speedy responsiveness to the foreign market [8, 25] to enhance the digital BMI. Hence, this study addresses the research question: ***"To what extent do internet capabilities (platform and web) influence the digital BMI and the extent strategic agility mediates this relationship?"***

Meanwhile, the literature points out that top management team (*hereafter, TMT*) experiences plays a critical role in generating new ideas and solutions for business [26]. As TMT diversity increases, an important question is raised regarding how diversity affects the business innovation model [27]. While studies have determined the importance of a specific TMT functional experience, e.g., international business management functional experience may help change technological realities in internationalization [28] through the international network [29]. However, scholarly work has remained scant in considering functional diversity that might be more influential in strategic agility and digital BMI. A diverse TMT is often exposed to information technology [30] and developing market trends for business [31]. Diverse experiential knowledge provides access to knowledge and leads to the generation of new business model ideas [32]. Based on these arguments and drawing from upper echelon theory [33] that postulates that a firm is a reflection of top management, this study addresses the question, ***"To what extent, TMT functional diversity moderate the relationship between internet capabilities and strategic agility, and the relationship between strategic agility and digital BMI?"***

This study presents key contributions to the literature on DCs driven antecedents of digital BMI of a developing economy's INV. Although platform capabilities are gaining attention in business research, their role in innovation-related outcomes is underexamined. Existing studies also highlight the importance of web capabilities concerning opportunity exploration and marketing performance [34]. By examining the role of the platform and web capabilities, this study adds more explanation to Warner and Wäger [35] framework of how digital DCs driven competencies enable digital BMI. Another important contribution is integrating the upper echelon's theoretical perspective with dynamic capabilities, which helped light up the moderating role of TMT functional diversity in enhancing the influence of DCs driven competencies in digital BMI.

## **2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK**

### **2.1 Digital BMI**

Digital transformation refers to disruptions in business activities due to emerging technologies that require businesses to innovate their standard operating models [36]. In responding to digital disruption and building capabilities for digital transformation, firms require digital dynamic capabilities, i.e. digital sensing, digital seizing and digital transforming [35], such as web capability and platform capability to navigate the digital ecosystem effectively. This is relevant to international firms as these firms often require web and platform-based capabilities for effective cross-border operations [2]. BMI is defined as a firm's logic for creating, capturing and delivering value [37]. Although BMI research has recently gained scholarly attention [38, 39], the DCs driven antecedents of digital BMI are generally an under-studied domain [2]. The DCs driven antecedents of digital BMI are critical to explore in international new venture context, given prior work in internationalization literature has predominantly focused on country related factors such as infrastructure or technology readiness [40]. However, these

firms often require digitalization capabilities to deal with the intricacies and needs of foreign markets [2]. Many internationalizing firms now rely on digital infrastructures to create value for customers and create new revenue opportunities. Digital business model helps to internationalize firms with regard to both internal and external flow of digital activities to create value for global customers [12, 41]. It helps the firms with external organizing for responsiveness [5]. The rise of rapid digitalization has compelled many international new ventures to even take a path to internationalization as born digitals [12]. Specifically, in the context of international new ventures, the digital business may offer firms opportunities to compete, e.g., on a global scale using digital capabilities [42] and entrepreneurial opportunities for internationalization activities [43]. Given that BMI literature in the wake of digital transformation requires scholarly attention [44] as internationalizing firms often struggle to engage in digital transformations processes [45], this study addresses this gap by examining the antecedents of the digital BMI from dynamic capability and top management functional diversity perspective.

## **2.2. Platform and Web capabilities**

Studies have presented contradictory findings regarding internet adoption for international market success. Whilst a recent study report that adopting internet-based capabilities can enhance international performance [23], some studies note no direct effect on export performance [45]. Moreover, studies in this regard have paid limited attention to the platform and web capabilities, particularly for digital BMI in internationalization, despite their important role in shaping internationalization capabilities [23].

According to Teece, et al. [24], dynamic capabilities are those capabilities that allow a firm to sense and seize opportunities, navigate threats, and reconfigure to meet evolving market trends. These capabilities are fundamental for international business operations as they allow internationalizing firms to keep re-designing their business innovation models [46]. In line with

this postulation, both platform and web capabilities can be seen as dynamic in nature as these can support INVs' different functions in exporting [47]. Web capability can help identify new ways of performing functions [20], such as replacing conventional approaches to interact with customers and new ways for customers to identify information regarding firms' offerings [48]. Web capability allows scalability, flexibility, interactivity, brand management and communications [49]. On the other hand, platform capability is a tool for knowledge sharing, thus improving decision making efficiency and flexibility [50]. Platforms bring together complementors and users, whereby their input enhances the value of platforms [51, 52] and helps attract users from other countries [53]. This capability helps in forecasting customers' information and analyzing market trends for innovative ideas from customers [35], leading to improving innovation speed and quality [54]. The platforms help international business operations [55, 56] and gain attention in digital innovation [57]. For example, Facebook and WeChat also served as low-cost platforms to interact with foreign customers and facilitated the internationalization of resource-constrained developing markets firms [58]. It is also argued that platform and web capabilities are a new way of achieving competitive advantage in a contemporary digitalized economy [60] as they present new connectivity methods with internationally diverse partners [59]. This is also consistent with the digital dynamic capability framework of Warner and Wäger [35], which suggests that, for digital change in business model firms need to enhance their digital BMI.

Platform and web capabilities are important for applying emerging technologies to reconfigure BMI [60, 61]. Hence, such capabilities may provide advantages in value creation activities through digitalization [62, 63]. In the context of international new ventures, firms are now accelerating towards digital BMIs to navigate through the intricacies of foreign market operations as well as to gain advantages from global scaling [42]. International new ventures are entrepreneurial firms by nature that internationalize at the early stages of their inception

[64]. Scholars have shown that the digitalization of commerce is rejuvenating the traditional ways of doing business and revenue creating mechanisms [65], which has motivated many international new ventures to adopt digital BMIs [66]. The global survey shows that digital platform providers are the world's most valuable brands [67]. Moreover, many startups are inclined towards developing digital capabilities for international markets [68]. Hence, web and platform capabilities may play a role in transforming the digital BMI of INVs. While a recent study has linked platform and web capabilities to export marketing capabilities [23], there is a gap in understanding the effectiveness of these capabilities for digital BMI in the context of INVs. Given that internationalizing firms' success often depends upon information technology capabilities [69], it is important to explore the extent to which web and platform capabilities contributes to digital BMI in context of INVs. Accordingly, we posit that:

**H1a:** *Platform capability positively influences digital BMI.*

**H1b:** *Web capability positively influences digital BMI.*

## **2.2 Mediating Role of Strategic Agility**

Strategic agility is defined as a meta dynamic capability that encompasses a set of activities to create value in an evolving environment [70]. The dynamic capability theory [71, 72] suggests that strategic agility is a vital dynamic capability, and internationalizing firms can leverage value from such capabilities in international business operations [73]. Strategic agility is a dynamic capability as it encourages firms to reconfigure their resources and capabilities within a short time frame [74] and allows responsiveness and adaptation [8].

The availability of digital infrastructures has restructured the processes, structures, ways and costs of doing international business. Platform capability helps in sensing the market trends for innovation [35], leading to improving the innovation speed and quality [54] and obtaining the



agility for innovative solutions [75]. The platform performs various roles such as aggregation, matching, and market trend analysis [23]. For instance, aggregation allows a firm to understand market demands, competition, and new ways of doing business. Matching facilitates understanding the importers' pricing requirements and quotations which may compel a firm to be responsive and adaptable. Similarly, web capability facilitates informational, transactions, and interaction functions [23]. For example, a website can facilitate communicating product catalogues and obtaining customers' feedback for innovations. Web technologies serve as a means to share, co-create, and discuss knowledge [76]. The web capabilities allow greater customer interactions and facilitate the international business of INVs and exporting firms [77]. The web-based capabilities help obtain market information via interaction [22], which helps firms match the market offerings at a low cost [78]. Website capabilities are critical for resource-constrained internationalizing SMEs as these capabilities facilitate their foreign market entry and allow them to showcase offerings to foreign customers [78]. It is also argued that strategic agility often stems from IT capabilities, such as web capabilities [79]. For example, local adaptations of internationalizing firms' websites facilitate foreign customer engagement, leading to enhancing further opportunities for internationalizing firms [78]. Website quality is also linked with business integration and effective export activities [80]. Platform capabilities also help in structural and relational interdependencies that open the door for new and efficient ways of knowledge sharing, responsiveness and flexibility [59]. Studies also show that investments in platforms enable operational flexibility and provide growth options, allowing firms to meet market opportunities [81]. Strategically agile firms are nimble, fast and adaptive to evolving market opportunities [82]. Digital capabilities also allow firms to compete in hypercompetitive markets, such as in our case of international markets, as it allows the acquisition of fundamental knowledge of evolving market needs [83]. For example,

platforms help in new service development [84] and new product developments in international markets [85] and also facilitate subsequent innovations [86] and speed to the market [56].

The studies mentioned above collectively hint that platform and web capabilities lead to strategic agility. In line with dynamic capability [24], the platform and web capabilities can be more influential when linked with high-order dynamic capabilities [23], such as strategic agility [8]. Studies have also linked strategic agility with business model innovation [87, 88], as well as with digitalization-related advancements [89]. This is because constant strategic renewal is important for digital transformations [35]. Therefore, it is plausible that agility can mediate the effects of the platform and web capabilities on digital BMI. Developing market firms are often resource-constrained [90] and lack digitalization capabilities and skills [91]. However, in a contemporary digital economy, digital capabilities can be critical for digital transformations, leading to foreign market success [59]. Hence, it is important to test the following hypothesis:

**H2a:** *The direct influences of platform capability on digital BMI are mediated by strategic agility.*

**H2b:** *The direct influences of web capability on digital BMI are mediated by strategic agility.*

### **2.3 Moderating Role of Top Management Diversity**

The upper echelons theory postulates that TMT composition and characteristics influence not only firms' activities but provide them with the foundation for developing the dynamic capability required for their growth and success [32, 92]. The extant business management literature that adopted the upper-echelon theory asserts that the composition of TMT encourages novel thinking in firms, thus enhancing firms' growth and ability to deal with the dynamic environment [93, 94]. This postulation underlies the assumption that diversity in TMT

influences strategic actions [95] as it helps generate a wide variety of knowledge and better predict the changes in the dynamic external environment [92, 96]. TMT diversity, in general, is defined as the differences in relation to backgrounds, such as gender, functionality, and tenure. [97]. However, functional diversity denotes the diversity of TMT's cognition, experience and knowledge across different functional areas [98]. Functionally diverse TMT can draw from a large pool of expertise and knowledge and evaluate alternative solutions to make critical strategic decisions [99]. On the other hand, studies also note that TMT functional diversity can lead to interpersonal conflicts, communication breakdown and delay in decision-making, and can lead to fragmentation in TMT [33]. However, studies also argue that such conflicts can enhance decision quality by stimulating rigorous and more constructive debates among TMTs with different and competing perspectives.

Despite the growing importance of understanding TMT characteristics in strategic decision-making literature, there is a limited emphasis in international business on the role of TMT diversity in strategic agility and BMI [100]. Narayan et al. (2021) [27] report that diverse functional and educational backgrounds help TMTs enhance their cognitive diversity, providing them with the agility to pursue explorative and exploitative innovation. The diversity of TMTs' cognitive capabilities, also considered as the diversity of thought, refers to the variety in TMTs' knowledge and intellectual capabilities [101]. Cognitive diversity enables TMTs' dynamic capabilities to address strategic challenges and gives them the agility to adopt a firm's course [102]. Hence, we argue that diverse functional knowledge of TMTs would facilitate the influence of web and platform capabilities on strategic agility for digital BMI. This is because greater diversity of TMT knowledge influences how knowledge can be recombined creatively to innovative solutions [103, 104]. Diverse functional knowledge would allow TMT to effectively sense and seize the market information and reconfigure for transformations [105]. In internationalizing firms, TMTs have a steering role in sensing and seizing opportunities in

sourcing and reconfiguring resources in technological domains and geographical regions [106, 107]. In other words, they play a key role in developing international strategic agility, as TMT diversity is the antecedent of international strategic agility [11].

Given that web capability facilitates informational, transactions, and interaction functions, including obtaining customers' feedback for innovation [23], platform capabilities may help in structural and relational interdependencies that open new and efficient ways of knowledge sharing and responsiveness and flexibility [59]. It is plausible that TMT's diverse functional knowledge strengthens the positive influence of web and platform capabilities on strategic agility. Accordingly, we posit that:

**H3a:** *The effects of platform capability on agility are moderated by TMT diversity.*

**H3b:** *The effects of web capability on agility are moderated by TMT diversity.*

TMT, by virtue, are the key decision-makers in business model innovation [108]. However, the digital BMI literature in the context of internationalizing firms has remained a black box in terms of understanding the influence of TMT functional diversity [100]. TMT diversity influences the business innovation model through knowledge processing [109] as well as the effective reallocation of resources to strategic priority areas as they are gatekeepers of resources [110]. The knowledge processing and flexible reconfiguration of resources are the aspects of strategic agility for international market operations [8]. BMI also requires diverse cognitive managerial attributes to reconfigure resources for transformations [108]. TMTs' cognitive diversity increases their attention on BMI because they will have access to a wide variety of data, perspectives and understanding to follow trial-and error experimentation related to BMI [27]. It is argued that when TMT diversity reaches a certain threshold, it affects business model innovation through information processing and reconfiguration [32], hinting at the positive moderating influence of TMT diversity on strategic agility as well as BMI. Given that digital business model innovation can be complex for developing market firms who often lack digital

competencies [91] but having strategic agility can facilitate international business [8], it is plausible that TMT functional diversity with breadth of experience in marketing, international business, strategic planning domains etc. would strengthen the influence of strategic agility on digital BMI. Under a highly diverse functional knowledge, developing market INVs may be able to successfully implement the digital BMIs through strategic agility. Based on these arguments, we propose the following hypothesis for testing:

**H4:** *The influence of agility on digital BMI is positively moderated by TMT diversity.*

Accordingly, the conceptual framework is presented in Figure 1 below.

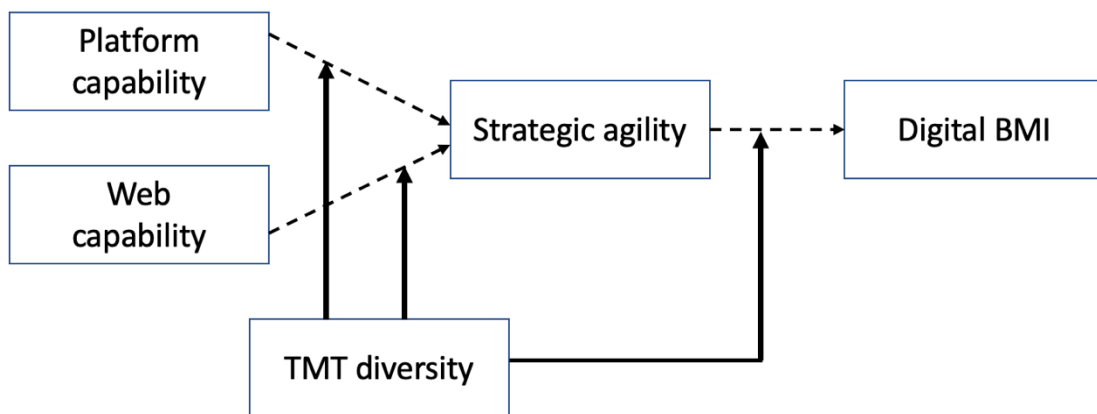


Figure 1. Conceptual Framework

### 3. METHODS

#### 3.1 Study context and data collection

We utilized a survey to collect primary data from INVs based in Pakistan. The context of Pakistan is an appropriate choice to study business model innovation for three reasons. First, the economy of Pakistan is experiencing growth with a 6% annual change and \$346.34 billion in GDP in the year 2021 [111]. This suggests a rising Pakistani economy attracting foreign direct investment and encouraging young ventures to expand abroad [112]. Second, policy

reforms and trade liberalization in Pakistan led to the emergence of new ventures that are important contributors to the overall economic growth of the country [113]. Third, Pakistan exhibits the characteristics of developing markets, such as a lack of financial credit availability, weak institutional support, limited legal enforcement system, and a lack of financial intermediaries [114]. This allows new ventures operating in Pakistan to become more flexible and agile [115] and adopt digital technologies to remain competitive [116]. Thus, Pakistan offers an interesting context to study the digital competencies of INVs for strategic agility and digital BMI.

We conceptualized INVs by using three criteria: (1) firms as a unit of analysis, (2) firms that are young, and (3) firms that are seeking international markets through exporting [117]. Further, in line with previous literature [118-121], we operationalized INVs as firms that started international operations within three years of inception and generated 25% of total revenues from international markets within three years. The sample was drawn from the Pakistan Chambers of Commerce & Industry and Pakistan export directory. After the distribution of the questionnaire to 323 firms, we obtained a usable sample of 145 firms, representing a response rate of 44.89%.

To determine whether non-response bias is a problem in our study, we compared the early and late response groups. The results of the t-test revealed that the two response groups are not different in terms of demographics and main variables. This confirms that non-response bias is not an issue in this study.

### **3.2 Measurement of constructs**

***Platform capability*** – It is the extent to which INVs utilize functions and services offered by platform towards exporting [122]. We operationalized platform capability using five items adopted from Kim [23]. Respondents were asked to indicate the extent to which they use

platform using a seven-point Likert scale with anchors ranging from (1 = Minimal use; 7 = Great use).

**Web capability** – We defined web capability as the extent to which INVs utilize websites to support exporting functions and activities. In line with previous studies [23, 47], we used eight items to measure web capability. Respondents were asked to rate the extent to which the website performs functions and activities of exporting on a seven-point Likert scale with anchors ranging from (1 = Not at all; 7 = All the time).

**Strategic agility** – Strategic agility is the ability of INVs to continuously adjust and adapt strategic directions in response to changing market conditions [123]. It was measured using eight items adopted from Tallon and Pinsonneault [124]. Respondents were asked to rate the extent to which they agree about the ease of performing different actions (1 = Strongly disagree; 7 = Strongly agree).

**Digital business model innovation** – It refers to new ways of creating and capturing the business value that is enabled by digital technologies [125, 126]. We operationalized DBMI using nine items adopted from Soluk, et al. [127] on a seven-point, Likert-type scale with anchors ranging from (1 = strongly disagree; 5 = strongly agree).

**TMT functional diversity** – The functional background of TMT was defined in terms of project and product development management, strategic planning, international business management, financial and administrative services, marketing and sales, human resources, and others, including services, logistics, purchasing, and others. Following Buyl, et al. [109], the respondents were asked to rate up to three functional experience categories in which they have experience. This approach increases ecological validity compared to considering only one function [128, 129]. The average diversity level for each firm was calculated using Attneave's [130] entropy based transmission measure ( $T_{xy}$ ). This measure involves three types of information: (1) the proportional distribution of the number of team members over the

functional categories ( $H_x$ ), (2) the proportional distribution of the number of functional categories over the team members ( $H_y$ ), and (3) the combined proportional distribution ( $H_{xy}$ ). The transmission index value ( $T_{xy}$ ) equals  $H_x + H_y - H_{xy}$ . The  $T_{xy}$  value ranges between 0 to 1, where a large value indicates a higher level of functional diversity.

**Control variables** – We controlled for firm size, firm age, CEO age, and education. We measured firm size as the number of employees and firm age as the number of years since the firm was founded. We assessed the CEO age in the number of years. CEO education was assessed by asking respondents to state the highest degree achieved (1 = high school, 2 = diploma, 3 = bachelor's degree, 4 = master's degree/doctoral degree).

#### **4. DATA ANALYSIS AND RESULTS**

The data analysis was conducted in two steps: measurement model estimation and structural model estimation.

##### **4.1 Measurement model estimation**

A measurement model was estimated to determine the reliability and validity of the constructs. The results suggest that the measurement model fits the data well ( $\chi^2/DF = 1.24$ , CFI = 0.98, TLI = 0.97, GFI = 0.94, RMSEA = 0.04, SRMR = 0.03) and confirm the uni-dimensionality of constructs. Next, construct reliability was assessed by inspecting Cronbach's alpha, composite reliability, and factor loadings. As shown in Table 1, Cronbach's alpha and composite reliability values were greater than 0.70 [131], confirming internal reliability of the measurement model. The factor loadings are also above the recommended threshold of 0.50 [132], confirming item reliability. In addition, the convergent validity of the measures was established as all factor loadings are significant at  $p < 0.01$  [133], and the average variance extracted (AVE) showed satisfactory values of 0.50 and above (see Table 1).



**Table 1.** Measurement details.

Description of items	Standardized factor loadings
<b>Platform capability (CA = 0.91; CR = 0.90; AVE = 0.64)</b>	
1. Communicate and coordinate product/price/delivery/payment information with foreign customers.	0.72
2. Disseminate product/service information.	0.84
3. Understand product and market preference.	0.85
4. Use platform's match service to match with foreign customers.	0.85
5. Aggregate more foreign customers.	0.73
<b>Web capability (CA = 0.95; CR = 0.94; AVE = 0.70)</b>	
1. Provide product information or serves as product catalogue.	0.88
2. Help customers understand product quality, usability and reliability.	0.89
3. Provide information about company's background/ overview.	0.83
4. Provide information about frequently asked questions (FAQ).	0.87
5. Provide customer service/assistance or instant messaging-based communication.	0.89
6. Provide feedback form for customers.	0.78
7. Provide technical support.	0.70
<b>Strategic agility (CA = 0.95; CR = 0.95; AVE = 0.69)</b>	
1. Our firm can quickly respond to changes in aggregate consumer demand.	0.83
2. Our firm can quickly customize a product or service to suit an individual customer.	0.83
3. Our firm can quickly react to new product or service launches by competitors.	0.85
4. Our firm can quickly introduce new pricing schedules in response to changes in competitors' prices.	0.87
5. Our firm can quickly expand into new regional or international markets.	0.88
6. Our firm can quickly change (i.e., expand or reduce) the variety of products / services available for sale.	0.78
7. Our firm can quickly adopt new technologies to produce better, faster and cheaper products and services.	0.82
8. Our firm can quickly switch suppliers to avail of lower costs, better quality or improved delivery times	0.79
<b>Digital business model innovation (CA = 0.93; CR = 0.93; AVE = 0.59)</b>	
In the context of digital technology adoption, our business model	0.70
1. ... offers new combinations of processes, products, services, and information	0.75
2. ... attracts a lot of new customers	0.75
3. ... attracts a lot of new suppliers and other business partners	0.76
4. ... brings together internal and external participants in novel ways.	0.79
5. ... is revolutionizing the way business deals are made	
In the context of digital technology adoption, we frequently introduce	
6. ... new ideas and innovations in our business model	0.80
7. ... new processes, routines, and norms in our business model	0.77
8. In the context of digital technology adoption, we are pioneers with our business model	0.78
9. All in all, and in the context of digital technology adoption, our business model is novel.	0.82

To assess the discriminant validity, we followed Fornell and Larcker [134] procedure and compared the square root of AVE with the corresponding inter-construct correlation. Results in Table 2 confirm the discriminant validity as the values of squared AVE of each construct is greater than the respective inter-construct correlations. The descriptive statistics and correlation estimates are provided in Table 2.

**Table 2.** Descriptive statistics and correlations.

Variables	M	SD	1	2	3	4	5	6	7	8	9
1. CEO age	3.82	0.23	1								
2. CEO education	-	-	0.04	1							
3. Firm age	2.01	0.41	0.06	-0.017	1						
4. Firm size	3.72	0.35	-0.09	-0.090	0.40***	1					
5. Platform capability	5.22	0.85	0.01	0.26**	0.05	-0.10	<b>0.80</b>				
6. Web capability	5.11	0.64	0.08	0.24**	-0.03	-0.06	0.27***	<b>0.83</b>			
7. Strategic agility	5.57	1.00	-0.08	0.17*	0.01	-0.05	0.37***	0.25**	<b>0.83</b>		
8. Digital BMI	5.08	0.67	-0.01	0.29***	0.14	0.07	0.22**	0.16	0.37***	<b>0.77</b>	
9. TMT functional diversity	0.57	0.50	0.12	0.24**	0.15	0.09	0.19*	0.10	0.02	0.23**	1

Note: \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$ ; M = mean; SD = standard deviation; square root of AVEs at the diagonals and in bold.

Given the cross-sectional and signal source nature of our study data, it is difficult to rule out the potential for common method bias. Therefore, we undertake several ex-ante and ex-post procedures to address the issue of common method bias. In terms of ex-ante procedures, we randomized the survey items to prevent the recognition of potential relationships between variables by respondents, avoided the use of ambiguous terms to avoid confusion, and ensured anonymity to respondents to prevent their privacy. For ex-post procedures, we conducted statistical tests by estimating and comparing three confirmatory factor analysis (CFA) models. Model 1 estimated a method-only model wherein all items were loaded onto a single latent construct ( $\chi^2/DF = 6.31$ , CFI = 0.36, TLI = 0.31, GFI = 0.26, RMSEA = 0.11, SRMR = 0.13); Model 2 estimated trait-only model wherein each item was loaded onto its respective latent construct ( $\chi^2/DF = 1.24$ , CFI = 0.98, TLI = 0.97, GFI = 0.94, RMSEA = 0.04, SRMR = 0.03); and Model 3 estimated method-and-trait model where a common factor was linked with items in Model 2 ( $\chi^2/DF = 1.21$ , CFI = 0.98, TLI = 0.97, GFI = 0.94, RMSEA = 0.03, SRMR = 0.03).

A comparison of the three models suggests that Model 2 and Model 3 are superior to Model 1, and Model 3 is not substantially better than Model 2. Further, we adopted Lindell and Whitney [135] approach and used marker variables (i.e., travel time between my office and home cause stress) with no theoretical linkage with other variables in the study. The correlation between the marker and other variables of the study ranged between -0.03 to 0.04. These results confirm that common method bias is not an issue in our study.

#### 4.2 Structural model estimation

We used structural equation modelling to test the hypotheses of the study using AMOS 28.0. Prior to hypotheses testing, we mean-centred the variables involved in interaction terms to attenuate the potential threat of multicollinearity [136]. We created three interaction terms: (1) platform capability x TMT functional diversity; (2) web capability x TMT functional diversity; and (3) strategic agility x TMT functional diversity. To further assess multicollinearity, we used the variance inflation factor (VIF), where the largest VIF value was 1.93, which is far below the threshold of 10 [137]. This confirms that multicollinearity is not an issue in this study.

We presented the results of path analyses in Table 3. Model 1 contains the results of the direct effects of platform capability and web capability on digital BMI. Model 2 presents the results of the direct effects of platform capability and web capability for strategic agility. Model 3 adds TMT functional diversity as a moderator variable. The results in Model 4 assess the direct effect of strategic agility on digital BMI. Model 5 estimates the moderation effect of TMT functional diversity. Model 6 presents the results of the mediation effect of strategic agility.

Table 3. Results of structural model estimation.

Digital BMI M1	Strategic agility M2	M3	M4	Digital BMI M5	M6
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<b>Control variables</b>						
CEO age	-0.03 (-0.42)	-0.11 (-1.35)	-0.09 (-1.09)	-0.10 (-1.29)	-0.02 (-0.23)	0.02 (0.20)
CEO education	0.23* (2.62)	0.05 (0.62)	0.07 (0.79)	0.09 (1.02)	0.17* (2.05)	0.18* (2.22)
Firm age	0.16+ (1.82)	0.02 (0.27)	0.03 (0.36)	0.05 (0.61)	0.16 (1.87)	0.13 (1.65)
Firm size	0.03 (0.31)	-0.03 (-0.30)	-0.03 (-0.32)	-0.02 (-0.28)	0.01 (0.10)	0.01 (0.12)
<b>Main effects</b>						
Platform capability	0.22* (2.61)	0.32*** (3.82)	0.33*** (3.88)	0.33*** (3.79)	0.01 (0.16)	0.02 (0.25)
Web capability	0.17* (2.03)	0.21** (2.93)	0.20** (2.87)	0.20* (2.42)	0.04 (0.51)	-0.04 (-0.43)
TMT functional diversity			-0.08 (-0.93)	-0.08 (-1.01)	0.15+ (1.81)	0.15+ (1.88)
Strategic agility					0.35*** (3.92)	0.38*** (4.36)
<b>Interaction effects</b>						
Platform capability x TMT functional diversity				0.04 (0.46)		
Web capability x TMT functional diversity				0.23** (2.75)		
Strategic agility x TMT functional diversity						0.27*** (3.43)
<b>Goodness-of-fit indices</b>						
X <sup>2</sup> /DF	1.53	1.88	1.42	1.38	1.22	1.21
CFI	0.96	0.96	0.97	0.98	0.98	0.98
TLI	0.94	0.93	0.95	0.96	0.97	0.97
GFI	0.91	0.91	0.92	0.92	0.93	0.93
RMSEA	0.05	0.05	0.05	0.04	0.04	0.04
SRMR	0.05	0.04	0.04	0.03	0.03	0.03

Notes. +  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; standardized coefficients are shown; T-values in parentheses.

Hypothesis 1 consists of two sub-hypotheses where in H1a, we argue that platform capability is positively linked with digital BMI and, in H1b, that web capability is positively associated with digital BMI. As shown in Table 3, the results in Model 1 reveal a positive and significant

effect of platform capability ( $\beta = 0.22, p < 0.05$ ) and web capability ( $\beta = 0.17, p < 0.05$ ) on digital BMI, thus providing support for hypothesis 1a and hypothesis 1b respectively.

Our second hypothesis consists of two sub-hypotheses (i.e., H2a and H2b) related to the mediation effect of strategic agility. Based on Baron and Kenny's (1986) approach, we found support for three major conditions. First, platform capability ( $\beta = 0.22, p < 0.05$ ) and web capability ( $\beta = 0.17, p < 0.05$ ) positively and significantly predicts the digital BMI in Model 1. Second, platform capability ( $\beta = 0.32, p < 0.001$ ) and web capability ( $\beta = 0.21, p < 0.01$ ) positively and significantly influence strategic agility in Model 2. Third, we included platform capability and strategic agility simultaneously in Model 5. The model estimates show that the effect of strategic agility on digital BMI remains significant ( $\beta = 0.35, p < 0.001$ ), but the influence of platform capability on digital BMI becomes insignificant ( $\beta = 0.01, p > 0.10$ ). This provides support for hypothesis 3a. For the hypothesis 3b, the analysis shows that the influence of web capability on digital BMI becomes insignificant ( $\beta = 0.04, p > 0.10$ ) when web capability and strategic agility are concurrently added ( $\beta = 0.24, p < 0.01$ ), but the effect of strategic agility on digital BMI is positive and significant ( $\beta = 0.35, p < 0.001$ ). This supports hypothesis 3b, suggesting that strategic agility mediates the relationship between web capability and digital BMI.

Model 3 estimates the moderating effects of TMT functional diversity. Hypothesis 3a states that TMT functional diversity moderates the relationship between platform capability and strategic agility. The results in Model 4 show that TMT functional diversity has no moderation effect on the relationship between platform capability and strategic agility ( $\beta = 0.01, p > 0.10$ ). This provides no support for hypothesis 3a. Regarding hypothesis 3b, we found in Model 4 that TMT functional diversity positively moderates the relationship between web capability and strategic agility ( $\beta = 0.23, p < 0.01$ ). In addition, following Dawson and Richter's (2006)

recommendation, a slope test was conducted, and results revealed that the linkage between web capability and strategic agility is positive and significant at high levels of TMT functional diversity ( $\beta = 0.62, p < 0.001$ ), but the relationship between web capability and strategic agility is insignificant at low levels of TMT functional diversity ( $\beta = -0.20, p > 0.10$ ). Overall, the results support hypothesis 3b, confirming the moderation effect of TMT functional diversity for the relationship between web capability and strategic agility. The graph of TMT functional diversity, web capability, and strategic agility relationship is shown in Figure 2.

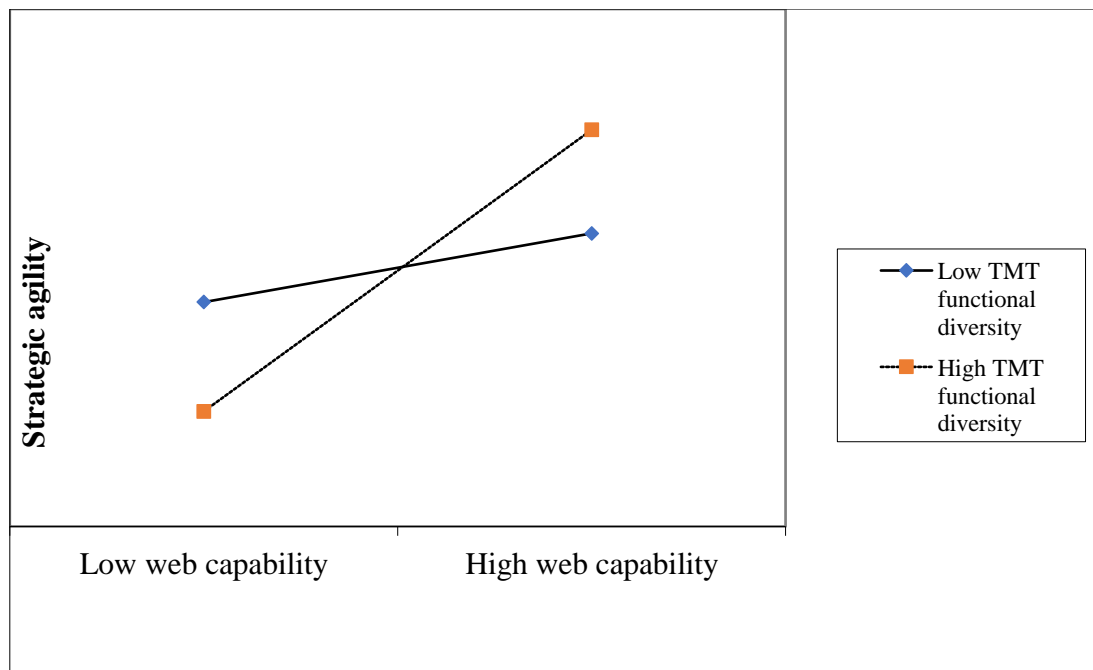


Figure 2. Interaction of web capability and functional diversity on strategic agility.

Model 6 tested hypothesis 4, which predicted that TMT functional diversity moderates the impact of strategic agility on digital BMI. The result revealed that the relationship between strategic agility and digital BMI is moderated by TMT functional diversity ( $\beta = 0.27, p < 0.001$ ). Further, a slope test showed that the linkage between strategic agility and digital BMI is positive and significant at higher levels of TMT functional diversity ( $\beta = 0.38, p < 0.001$ )

but insignificant at lower levels of TMT functional diversity ( $\beta = 0.03$   $p > 0.10$ ). We plotted this relationship in Figure 3.

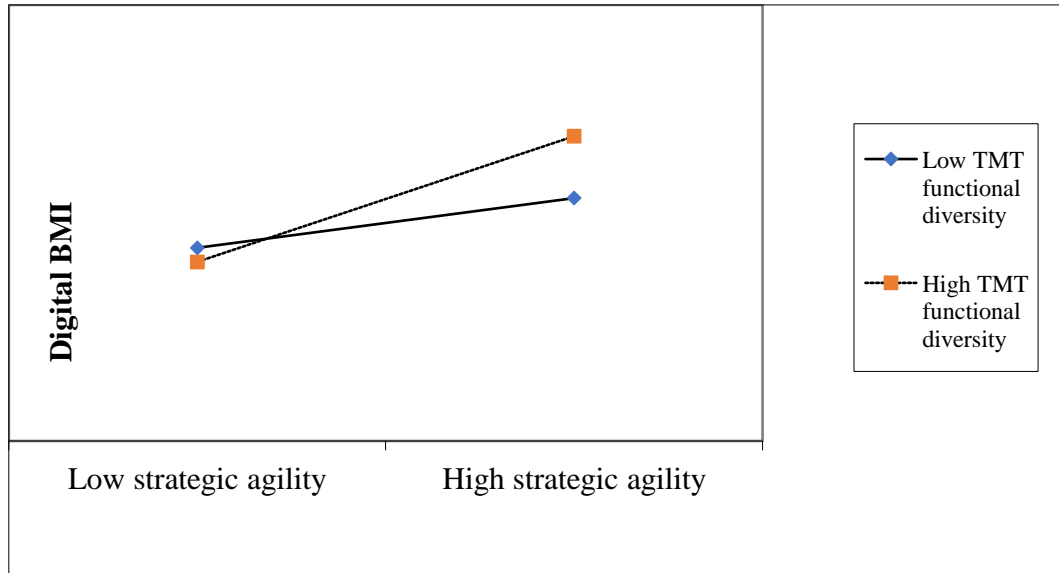


Figure 3. Interaction of strategic agility and functional diversity on digital BMI.

To provide additional insights, we conducted post-hoc analysis using PROCESS macro (Hayes, 2013). For the mediation effect of strategic agility, we find positive and significant effects of platform capability on strategic agility ( $\beta = 0.41$ ,  $p < 0.001$ ) and digital BMI ( $\beta = 0.14$ ,  $p < 0.05$ ), and positive and significant effect of strategic agility on digital BMI ( $\beta = 0.21$ ,  $p < 0.001$ ). Further, a significant total effect of platform capability on digital BMI via strategic agility is found with a corresponding lower-level confidence interval (LLCI) of 0.04 and an upper-level confidence interval (ULCI) of 0.29 using a bootstrap-estimated 95% confidence interval. This supports hypothesis 2a, that strategic agility mediates the association between platform capability and strategic agility. Accordingly, we followed the same process to test hypothesis 2b related to the indirect effect of web capability on digital BMI through strategic agility. The results suggest significant effects of web capability on both digital BMI ( $\beta = 0.17$ ,  $p < 0.05$ ) and strategic agility ( $\beta = 0.39$ ,  $p < 0.001$ ), on the one hand, and a significant effect of

strategic agility on digital BMI ( $\beta = 0.23$ ,  $p < 0.001$ ) on the other hand. Similarly, a significant total effect of web capability on digital BMI through strategic agility was found with a corresponding LLCI of 0.01 and ULCI of 0.34 using a bootstrap-estimated 95% confidence interval, thus supporting hypothesis 2b.

Further, we tested the moderation effect of TMT functional diversity using Model 58 of PROCESS macro. We found that TMT functional diversity positively moderates the relationship between web capability and strategic agility ( $\beta = 0.23$ ,  $p < 0.01$ ) as well as the linkage between strategic agility and digital BMI ( $\beta = 0.36$ ,  $p < 0.001$ ). More importantly, we found that the indirect effect of web capability on digital BMI through strategic agility is conditioned on TMT functional diversity (Index = 0.27; LLCI = 0.11 – ULCI = 0.45).

## **5. DISCUSSION AND IMPLICATION**

This study examines the influence of web and platform capability on digital BMI and the mediating role of strategic agility in these baseline relationships. Results support our propositions and suggest a positive relationship between web and platform capability with digital BMI as well as mediating role of strategic agility is also supported. These findings are consistent with insights in the existing literature on dynamic capabilities for digital transformations. For instance, Teece [138] suggest the influence of dynamic capabilities on BMI. Rachinger, et al. [139] also advocated the positive relationship between digitalization and BMI through the lens of dynamic capabilities. More specifically, Warner and Wäger [35] framework of digital dynamic capabilities suggests that strategic agility facilitates dynamic capabilities to digitally transform the business model. However, our results do not support the moderation of TMT diversity in the relationship between platform capability and strategic agility. One of the potential reasons for this might be that platform outcomes heavily rely on the innovativeness of the platform, and when the platform is not innovative, then moderators



such as TMT diversity do not add further value [140]. Firms in Pakistan struggle with innovation and creativity, and one of the reasons is institutional voids which refer to a lack of support from home country institutions [141]. Another possible reason is that we tested this moderation in the international business context of INVs in Pakistan. A domestic context might offer different findings and support our hypothesis.

### ***5.1. Theoretical implications***

This study contributes towards the existing body of knowledge by examining the influence of platform and web capabilities on digital BMI. Existing studies mainly focus on broader DCs in general to innovate the business model. This study explains how digital DCs-enabled web and platform capabilities competencies influence digital BMI through the mediation of strategic agility. Broadly, this study contributes by establishing and explaining how digital DCs driven specific competencies enable digital BMI by enhancing strategic agility. Although platform competitiveness and innovativeness are a main topic of discussion in the existing literature, how it leads to innovative outcomes needs further investigation. This study fills this gap by examining the role of the platform and web capabilities. This study adds more explanation to Warner and Wäger [35] framework of how digital DCs enable digital BMI.

Furthermore, research is scarce on the impact of web capabilities on BMI. Existing studies discuss internet capabilities concerning opportunity exploration and marketing performance [34], international business processes [142], and international market growth [143]. This study extends this debate by examining web capabilities as an antecedent of digital BMI in INVs from developing economies. Another important contribution of this study is that it integrates the digital dynamic capability view and upper echelon theory by discussing the moderating role of TMT diversity on digital dynamic capabilities and its outcomes, i.e., digital BMI, in this study. Furthermore, this study also contributes to the literature on international business by

discussing these issues in a unique context of INVs from a developing economy. It is one of the few studies discussing the platform and web capabilities of INVs from the developing economy of Pakistan. We found that, in the developing economy context, TMT diversity does not enhance the positive influence of platform capability on strategic agility. This is an important contextual contribution. This finding highlights the importance of DCs driven competencies in the context of developing economy INVs. This is due to limited support for innovations in developing economies [141]. TMT diversity is not enhancing the influence platform capability on strategic agility. Teece, et al. [24] argued that dynamic capabilities influence each other and create a loop. However, our findings suggest that this loop is context dependent. In a situation where micro-level individual initiatives are missing, DCs are unlikely to create such a loop.

## ***5.2. Practical implications***

This study offers rich implications for managers and practitioners. We are now facing the fourth industrial revolution, and businesses need to digitally transform their business models to leverage digital technologies and realize their digital strategy. Results established the importance of developing platform capability and web capability for the digital transformation of business model. To leverage the digital platform, INVs should enhance their coordination and communication with foreign partners. Effectively disseminate product/service information, understand product and market preferences, and use platform's match service to match with foreign customers. This will enable a platform ecosystem to reboot the strategy to adapt emergent forms of competition, collaboration, and mutual coexistence with a digital business model [144]. Firms should leverage their web capabilities by helping customers understand product quality, usability and reliability. INVs should enable web-based instant communication and feedback from and for customers and provide web-based technical support to facilitate digital BMI.

Strategic agility is another important antecedent of BMI. To create strategic agility for digital BMI, INVs should develop the ability to respond to changes in aggregate customer demand quickly, customize products to suit an individual customer, quickly react to competitor actions, expand in new international markets, and quickly adopt new digital technologies to produce better and faster products for customers. By leveraging strategic agility, web and platform capabilities, firms can offer new combinations of processes, products and information and attract new customers. Through such DCs driven competencies INVs can address internal and external challenges in a novel way. Also, such capabilities enable INVs to introduce new changes in business models and embed novel digital technologies in business processes, norms and routines, which enable digital BMI. Our results suggest that firms will not realize the full potential of their web capability and platform capability if they lack strategic agility. Results suggest full mediation of strategic agility in the relationship of digital BMI with web and platform capability. It means that web capability and platform capability will not enhance firms' digital BMI if firms are not flexible enough to quickly change their strategic direction to address the changing business environment. Our findings also suggest that managers should ensure TMT diversity. Top management team should be diverse in relation to backgrounds, such as gender, functionality, and tenure. Functional diversity implies the diversity of functional knowledge which is an important source of expertise and knowledge among the executives [104]. Functionally diverse TMT has a large pool of skills and knowledge that helps in strategic decision making [99]. Such diversity facilitates dynamic capabilities to enable digital BMI. From a broader perspective, INVs should ensure the micro-foundations of dynamic capabilities to realize their full potential.

By utilizing web capability, platform capability, strategic agility, and TMT, founders should ensure that their business model offers new combinations of processes, products, services, and information to attract new customers, suppliers, and partners. It should bring together internal

and external participants in novel ways to revolutionise the way business deals are made. In the context of digital technology adoption, firms should incorporate new ideas and innovations in digital business models to enable new digital processes, routines, and norms.

### ***5.3. Limitations and Future Research Directions***

This study has some limitations and future research suggestions. This study discusses the context of INVs from one developing market, which limits the generalizability to developing economy INVs. Therefore, future research should focus on developed and industrialized economies to test our results. Future research is also needed to further explain why TMT diversity does not moderate the relationship between platform capability and strategic agility. An in-depth qualitative inquiry could be useful for exploring this phenomenon. Furthermore, this study follows a survey design which is subject to non-response bias. Despite taking the appropriate measures to control non-response bias, future studies could use objective data to measure the study variables. Furthermore, due to methodological parsimony, this study does not examine the role of institutional voids in developing economies, which has the potential to influence the outcomes of this research. Future research should examine the role of institutional voids in developing economies on digital BMI enabled by digital dynamic capabilities.

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