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# Big-data AI analytics in value-chain innovation and international marketing strategy: insights from SMEs in cultural and creative industries

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## Abstract

**Purpose** – Despite great consensus on the positive impact of big-data-driven artificial intelligence (AI) analytics (BDAI) on a firm's performance, it still appears to be a black box mechanism through which small and medium-sized enterprises (SMEs) strengthen their dynamic competencies to innovate and expand their global footprint. To fill this theoretical and empirical gap we examine the relationship between BDAI affordances, digital marketing capabilities (DMCs), value-chain innovation and international market goals.

**Design/methodology/approach** – The study incorporates the dynamic capability view an extension of the resource-based view and the knowledge-based view to empirically examine the primary data collected from marketing managers and executives of SMEs in cultural and creative industries utilizing Structural Equation Modeling (SEM) analysis.

**Findings** – The study highlights the significant role of BDAI affordances such as intelligent process recommendations, customer intelligence and market intelligence on DMCs, where DMCs significantly affect value-chain innovation and international market strategy both directly and indirectly.

**Research limitations/implications** – The study minimizes the gap in identifying the BDAI affordances to drive innovation and international market strategy in the context of SMEs in cultural and creative industries. Marketing managers can incorporate these findings to enhance their digital capabilities for competitive advantages in international markets.

**Originality/value** – The study proposes a holistic framework of BDAI affordances for the strategic use of digital resources and knowledge to transform digital capabilities into new forms of value to expand in the international market. These insights are robust and grounded in findings provided by marketing practitioners.

**Keywords** Big-data-based AI analytics, Digital affordances, Digital marketing capabilities, Value-chain innovation, International market strategy, Cultural and creative industries

**Paper type** Research paper

## 1. Introduction

Businesses are currently being propelled by the ever-increasing trends of digitalization and global market expansion (Caputo *et al.*, 2022). The annual growth rate of global investment in

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digital business transformation stands at a remarkable 17.5%, with a projected value of an astounding \$7.4tn by the year 2023 (Wielgos *et al.*, 2021). The digital era has witnessed an unparalleled surge in data production across various sectors, leading to the emergence of big-data solutions capable of capturing, analyzing and interpreting vast amounts of information (Gkikas and Theodoridis, 2019). Simultaneously, advancements in artificial intelligence (AI) have enabled businesses to harness the potential of big data (Mogaji *et al.*, 2021), unlocking novel opportunities in digitally empowered international businesses (Cenamor *et al.*, 2019). With 75% of the world's population will be connected digitally by 2025 (Reinsel *et al.*, 2018), projections suggest that approximately 30% of global data will necessitate real-time digital processing by 2025, with data interactions occurring every 18 s (Akter *et al.*, 2021). Consequently, the global market for big data is poised to reach \$420.98bn by 2027 (Olabode *et al.*, 2022). Among the domains profoundly influenced by this transformation is the field of digital marketing. Here, big-data-driven AI analytics (BDAI) equip organizations to extract real-time insights from their operational and market activities (Chintalapati and Pandey, 2022), enabling the creation of targeted value propositions in international marketing strategies, especially beneficial for small and medium-sized enterprises (SMEs) with resource constraints (Falahat *et al.*, 2020).

Past research has emphasized the multifaceted impact of big data on organizational functioning (Wang *et al.*, 2020) and the digital marketing mix (Homburg and Wielgos, 2022), contributing to innovation (Al-khatib, 2023), strategic positioning (Huang and Rust, 2021) in the global digitalized market (Yang *et al.*, 2023). However, the existing literature is often limited in scope leaving managers with a narrow approach (Heredia *et al.*, 2022), particularly within Cultural & Creative Industries, grappling with unique challenges presented by expanding digital landscape (Chandna and Salimath, 2020; Hirsch and Gruber, 2015). This argument is further reinforced by the bibliometric analysis presented in Appendix 4. The progression presented by the interconnectedness of key concepts fortifies AI-driven performance leading to broader organizational and strategic outcomes. The nested linkages from through content mapping visualize performance, challenges, consequences and innovation. The cluster depicts an extended strategic framework as a recent and expanding cluster within the knowledge development around big data and AI analytics. This requires effective digital capabilities to thrive in global digital (Caputo *et al.*, 2022; Benjumea-arias *et al.*, 2022), a subject not extensively covered in the emerging business literature (Santoro *et al.*, 2020) on digitalization. BDAI enables managers to integrate internal and external knowledge to strengthen digital marketing, paving the way for new forms of value (Maroufkhani *et al.*, 2023). Data-driven marketing approach with BDAI capabilities significantly contributes to effective international marketing strategies (De Luca *et al.*, 2021). Our study empirically strives to fill this gap by investigating how BDAI empowers the digital marketing capabilities (DMCs) of SMEs in CCI by creating data-based intelligence at the micro, meso and macro levels to deliver desired international marketing outcomes. within the CCI by empirically answering these research questions (RQ). RQ1: What affordances does BDAI provide at the micro, meso and macro levels and how they influence DMCs? RQ2: How do DMCs affect value-chain innovation and international market strategy? RQ3: Do DMCs mediate the effects of BDAI affordances on value-chain innovation and international market strategy? RQ4: How does value-chain innovation affect international market strategy? RQ5: Does diverse digital culture moderate the relationship between digital marketing, value-chain innovation and international market strategy?

CCIs contribute to regional economic development and innovation, impacting all aspects of life (Lee *et al.*, 2022). CCIs are innovative (Rodríguez-Gulías *et al.*, 2020) and disrupt industrial and market dynamics (Chang *et al.*, 2021) given its creative content and consumer-driven nature. The literature focuses more on CCI macro-level determinants and ignores the impacts of technological innovations on the innovation and performance of CCIs (Rodríguez-Gulías *et al.*, 2020), i.e. big data and AI analytics disrupting existing business models and performances (Olabode *et al.*, 2022) within CCIs. Big data and AI analytics tools allow firms to get intelligence on patterns and trends much quicker to draw correlations with their existing or future strategies (Olabode *et al.*, 2022). China contributes 32% of the total global creative

goods exports and holds the highest global trade surplus, approximately US\$149.4bn, in creative goods (Creative Economy Outlook 2022). On the other hand, with 2.5 quintillion bytes of data every day (Olabode *et al.*, 2022), big data experienced a growth of 270 billion USD by 2022 (Anwar *et al.*, 2024), making it an invaluable resource for firms interested to expand in international market. This unique and rich context qualifies CCIs to study the impact of BDAI on digital marketing, leading to value-chain innovation and international market strategy.

Tolstoy *et al.* (2022) highlight the need to develop digital capabilities for SMEs to experiment with cost-efficient internationalization alternatives that resonate with market niches to develop iterative business models. We refer to big-data-based AI analytics as techniques and systems to integrate and analyze the huge volume of structured and unstructured data to support business strategies (Suoniemi *et al.*, 2020). DMCs rely on stakeholders' digital interactions to transform resources into valuable offerings, as emphasized by Rangaswamy *et al.* (2020). We conceptualize BDAI and digital marketing as dynamic capabilities where DMCs mediate the competencies obtained by digital resources for strategic outcomes. These dynamic capabilities translate BDAI at the micro, meso and macro levels into value-chain innovation and effective international marketing strategies, empowering SMEs in the CCI sector to prosper on a global scale. To balance conceptual rigor and managerial relevance, our work is grounded in the strategic marketing context and validated by marketing executives and managers attending the International Cultural Industries Fair (ICIF), 2023, exhibiting 4,000 investment and financing projects. During an interactive session with managers and marketers, it was revealed that data from customers, competitors and the market environment are purposely collected to serve information needs and operational goals. They also mentioned the affordance of real-time intelligence to improve processes along with customers and market knowledge to align DMCs with international marketing goals. They further elaborate international marketing goals in terms of value-chain innovation and appropriate strategy to address consumers' cultural and creative needs, which have been incorporated in this study. For instance, when the data generated by creative outputs, i.e. visual arts, music, literature, digital and new media, and fashion are processed through AI-powered analytical systems, offer deep insights for effective marketing strategies and products based on consumers' preferences and behavior, improving value co-creation and performance.

The present research contributes to the international marketing literature in the following ways. First, big-data-based international market strategy is a contemporary topic that has yet to be examined empirically in capability development for managing the international value-chain and market strategy. In this regard, recent international marketing literature has been calling for scholarly contributions (Del Vecchio *et al.*, 2022; Diaz *et al.*, 2022). The study contributes to this emergent stream of literature by showing its efficacy in DMCs development for international market strategy and value-chain innovation. The study contributes to the dynamic capability perspective in international marketing literature by linking it with emergent technologies. In this regard, the study contributes to the international marketing literature that argues for emerging market internationalizing firms to develop responsive strategies for the international markets (Khan, 2020; Khan and Khan, 2021), as such firms are often reluctant to adopt emerging technologies (Khan *et al.*, 2023). The study empirically validates the importance of digitalization in dynamic capability building in the international marketing context. The insights derived from this study provide valuable guidance and actionable recommendations for SMEs, empowering them to enhance their digital marketing strategies, foster value-chain innovation and chart effective paths toward international market expansion.

## 2. Literature review

Digital capabilities provide new strategic options for SMEs to develop businesses and maximize the value of their resources (Tolstoy *et al.*, 2021). Digital transforming businesses

are necessary to survive and thrive in the highly competitive global marketplace (Vadana *et al.*, 2021). These changes are significantly driven by the influence of big data and AI analytics reshaping how businesses create and deliver value-based transactions (Mariani *et al.*, 2022). Digital capabilities as transformative forces (Wielgos *et al.*, 2021) enable SMEs with process intelligence to inform strategic decisions (Chatterjee *et al.*, 2023). SMEs leverage data from various digital sources and interactions to gain profound insights into customer behaviors to enhance personalized digital experiences (Chintalapati and Pandey, 2022). Additionally, market intelligence plays a pivotal role in identifying opportunities, foreseeing competitors' strategies and fostering a deep understanding of the industry ecosystem, all of which inform marketing capabilities (Wang, 2020). The digital interaction is also influenced by diverse digital culture, i.e. differences in digital touchpoints, e-commerce, digital regulatory frameworks and access to digital technology (Katsikeas *et al.*, 2020). Digital regulatory frameworks are complexly different as businesses in a country may rely on using or selling data, whereas in other countries data protection is guaranteed to users (Dwivedi *et al.*, 2019). Big-data-enabled real-time marketing allows firms to link with customers without interfering browsing experience (Gupta *et al.*, 2021). While our understanding of digitalization and its implications for SMEs internationalization has grown over the past two decades, empirical research at the intersection of these two areas remains scarce (Lee *et al.*, 2022). Despite great consensus on its positive impact on a firm's performance, it still appears to be a black box mechanism through which this impact occurs, indicating new theoretical and empirical explanations (Olabode *et al.*, 2022).

This research gap is quite surprising, given the swift adoption of digitalization in the design of internationalization strategies by firms (Stallkamp *et al.*, 2021). Typically, SMEs encounter limitations such as restricted resources, insufficient knowledge, financial constraints, and limited management expertise when striving to expand into international markets (Manolopoulos and Kottaridi, 2018). International market strategy encompasses the plan of action designed to address the internal and external factors surrounding foreign markets (Ipek, 2021). Information sharing supports firms to get updates on market dynamics (Xu *et al.*, 2018) to update their market offering in international markets to better fulfill customer's needs (Wang, 2020). Market adaptation is a dynamic process that allows companies to be strategically flexible in responding to the interests of new customers or changes in competitive conditions (Xie *et al.*, 2019). Marketing capabilities play a crucial role in influencing competitive strategy choices, enabling firms to comprehend evolving market dynamics and secure sustainable competitive advantage (Wu *et al.*, 2020). Marketing capabilities have gained significant attention in driving superior firm market strategy and performance highlighting the positive impact of both specialized (communications, selling, pricing, product development and distribution) and architectural marketing capabilities (scanning the market environment, developing plans from this scanning and coordination) (Morgan *et al.*, 2009). BDAI helps to transform data into significant insights to improve DMCs fostering innovation and market strategy (Chatterjee *et al.*, 2023). Effective digital marketing equips SMEs to compete with larger enterprises by facilitating market intelligence gathering, reducing marketing costs, enhancing new product development and ultimately fostering competitive advantage and sustainable growth, particularly for SMEs lacking extensive knowledge (Firouzeh and Razavi Satvati, 2018).

DMCs encompass a wide array of skills, including social media marketing, mobile marketing, content marketing, search engine marketing, web analytics, marketing automation and email marketing (Wielgos *et al.*, 2021). Essentially, digital marketing involves firms collaborating with customers and partners to jointly create, communicate, deliver and sustain value for all stakeholders to facilitate digital coordination with suppliers and channel members, customer engagement, as well as marketing to meet the needs of business firms and their stakeholders (Liu, 2022). DMCs have high scalability and measurability fostering the implementation of highly information-based strategies (Homburg and Wielgos, 2022). DMCs are inherently data-driven, enabling companies to generate more information to better evaluate

the performance of marketing activities (Mikalef *et al.*, 2023). DMCs enhance interconnectivity and adaptability by linking customers, suppliers and channel partners, and by being responsive to market changes for value-creation (De Luca *et al.*, 2021).

### 2.1 Theoretical framework

The resource-based view (RBV) as a managerial framework allows firms to exploit internal resources or competencies at the micro level to realize a superior market position (Chatterjee *et al.*, 2022b). The RBV suggests to develop core competencies, benefiting organizations to perform better than their competitors (Wamba *et al.*, 2017). The RBV not only focuses on internal resources but also suggests their strategic deployment in a changing environment for better performance (Chatterjee *et al.*, 2022a). The RBV emphasis on essential internal tangible and intangible resources (“differential benefit of strategic resources”) for firm performance allows to expand the theory with concepts like dynamic capability view (DCV) (Gregory *et al.*, 2019) to adapt and integrate internal and external experience to reconfigure resources and competencies, responding to market dynamics (Mikalef *et al.*, 2020). DCV supplement RBV framework in the dynamic business environment and changing market conditions (Chatterjee *et al.*, 2023). DCV is a collection of routines when implemented with inputs allow firms to evaluate options to produce outputs (Kozlenkova *et al.*, 2014). For instance, the traditional view advocates a firm to exploit its resources and capabilities based on existing market opportunities, whereas DCV encourages a firm to develop new competencies to respond to emerging opportunities. DCV promotes to deploy and develop different capabilities, i.e. big-data-driven marketing and innovative capabilities to enhance performance in dynamic business environment (Chatterjee *et al.*, 2022a). DCV suggests resource utilization at full potential to achieve high-performing outputs and competitive advantage in the long term (Gao and Sarwar, 2022).

Decision-makers often turn to RBV to address the perennial question of why certain companies thrive while others falter (Kamasak, 2017). Real-time analytics capability, viewed as a specific competence at the individual micro-foundational level, is considered rare according to the RBV (Vrontis *et al.*, 2022). Capabilities are accumulated and formed by unique configurations and interrelations of a firm’s internal and external resources which are difficult to imitate (Kozlenkova *et al.*, 2014). In other words, capabilities can be the source of competitive advantage when they are durable, not transparent, not transferable and difficult to replicate (Bruce *et al.*, 2023). Dynamic capabilities theory indicates that rational integration and allocation of internal and external resources can promote enterprise capability improvement in responding to environmental changes (Ali *et al.*, 2022). Strong dynamic capabilities help an organization to be innovative, successful, and resilient, particularly in the presence of market turbulence (Wu *et al.*, 2022). Spanning organizational capabilities integrate both outside-in and inside-out capabilities (e.g. responsiveness to competitive and external market dynamics, technology development and cost reductions) (Wong and Ngai, 2023), allowing firms to develop a more holistic view of business planning and operations (Gregory *et al.*, 2019). In digital marketing, efficiency and effectiveness are similar as both measure the performance of a business process (Morgan *et al.*, 2018). DCV identifies two higher-order capabilities relevant to international performance, architectural and specialized export marketing capabilities, indicating learning from external markets and utilization of internal resources for marketing strategies (Gregory *et al.*, 2019). These capabilities are dynamic when they utilize processes to integrate, reconfigure, acquire and release resources to adapt to and even instigate changes in the market (Homburg and Wielgos, 2022). These capabilities are antecedents of a firm’s marketing strategy.

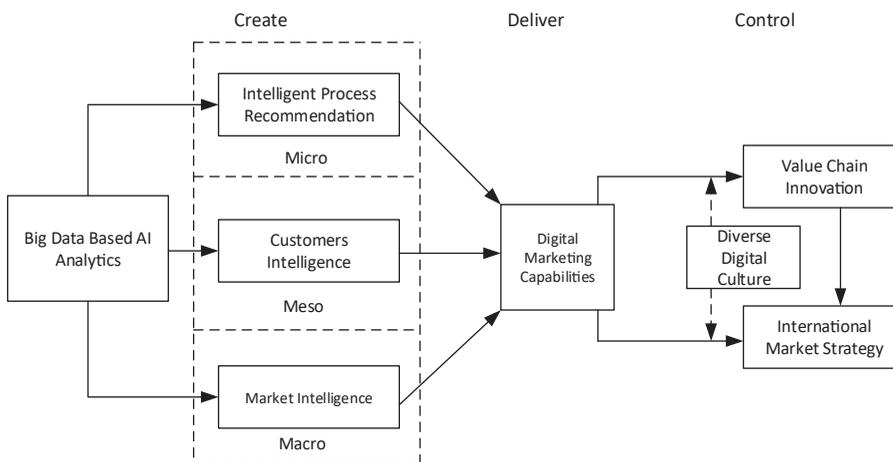
The knowledge-based view (KBV) treats knowledge as a uniquely distinct resource (Varsha *et al.*, 2021). In the context of marketing, considering knowledge management systems (KMS) as a foundational element of AI opens up opportunities for facilitating knowledge integration (Vlačić *et al.*, 2021). In short, the use of KBV in the context of

marketing and AI indicates the value-creation effects of data analytics for decision-making to support innovation and performance (Sáenz *et al.*, 2022). External market knowledge is crucial for maintaining a competitive edge (Bag *et al.*, 2021a). Big data as a knowledge-based resource strengthens dynamic capabilities to support strategic decisions (Gupta *et al.*, 2021). BDAI technology can capture, store, process and organize external market knowledge, facilitating problem-solving and decision-making processes (Duan *et al.*, 2019). The use of AI analytics can aid in creating competitive intelligence, allowing marketers to make more informed decisions, enhancing their analytical and decision-making capabilities, and boosting creativity (Fredström *et al.*, 2022). DMCs enable firms to generate unique knowledge and resources that are difficult for competitors to untangle as indicated by KBV and RBV of capabilities. We argue that BDAI indirectly affects DMC, enhancing value-chain innovation and performance, which is mediated by DMC. By strengthening DMC with BDAI, SMEs can enhance their ability to sense emerging opportunities, deliver value and transform their resources accordingly. The proposed model is presented in Figure 1.

## 2.2 Hypotheses development

Big-data analytics capability enhances an organization's competitive advantage but still businesses are struggling to adopt these disruptive technologies (Nilashi *et al.*, 2023). Big data and AI analytics adoption fail if not supported by suitable strategic targets (Choi and Park, 2022). Through an in-depth exploration of these interdependencies, our research endeavors to contribute to the existing body of knowledge surrounding big data and AI analytics in international marketing.

Big-data technologies and AI analytics play a crucial role in facilitating business transformation and fostering disruptive innovations in business models (De Luca *et al.*, 2021). The digital revolution has enhanced computational capabilities, and big data has amplified the power of AI in recent times (Dam *et al.*, 2019). It works as a strategic and operational enabler to influence a firm's performance due to its significant potential (Chatterjee *et al.*, 2023). Big-data analytics is capable of supporting firms in achieving superior business performance (Khalifaoui *et al.*, 2022). AI technologies play a pivotal role in determining the right international marketing strategies and effective digital marketing campaigns (Bag *et al.*, 2021b). Digital capabilities provide new strategic options for SMEs to maximize resource value (Tolstoy *et al.*, 2021). The literature suggests that BDAI plays a crucial role in creating



Source(s): Authors' own creation

Figure 1. Proposed model

user knowledge for valuable insights into user preferences to improve decision-making (Vlačić *et al.*, 2021). Digitalization has shifted from the periphery to the core of marketing strategy, making AI a necessary “business capability” and a “technological disruption” to be adopted (Mogaji *et al.*, 2021).

*H1a.* BDAI positively affects intelligent process recommendations.

*H1b.* BDAI positively affects intelligent process recommendations.

*H1c.* BDAI positively affects intelligent process recommendations.

Digital technologies are transforming business operations (Bruce *et al.*, 2023) with real-time decision-making capabilities (Chatterjee *et al.*, 2022a, b, c) allowing to establish the digital office, digital connectivity and process digitization (Wu *et al.*, 2022). The improved process is critical for knowledge sharing and implementation (Onofrei *et al.*, 2022). A firm’s ability to efficiently transform inputs into outputs is attributed to enhance performance (Chatterjee *et al.*, 2022a). Intelligent process recommendations assist decision-makers in analyzing huge volumes of data for optimum forecasting and strategic market planning (Vrontis *et al.*, 2022). AI analytics significantly impact and boost organizations’ operational efficiency and performance (Chen *et al.*, 2022). Firms can quickly process incoming information to determine the best marketing strategies and customers’ needs (Chatterjee *et al.*, 2022c). Decision-making requires information and knowledge gathering to facilitate the processes (Hossain *et al.*, 2022) while enabling strategic management (Gao and Sarwar, 2022).

*H2.* Intelligent process recommendations positively affect DMCs.

Customer intelligence is considered a valuable resource and a strategic goal for marketers (De Luca *et al.*, 2021). Customer intelligence stems from the content generated during customer interactions on digital platforms (Akter *et al.*, 2022), enhancing digital marketing strategies (Al-Surmi *et al.*, 2022). Understanding customer behaviors through customer intelligence helps to exploit opportunities in foreign markets (Morgan *et al.*, 2018). SMEs can anticipate patterns in customer behavior for effective marketing responses (De Luca *et al.*, 2021). Firms can leverage big-data-based customer intelligence in their internationalization strategies to better assess consumer preferences in a dynamic global market (Iranmanesh *et al.*, 2022). Customer-linking capabilities are integral to building relationships with potential customers, strengthening bonds with existing customers, and attracting new ones (Wang, 2020). Big data helps to identify alternatives to customer preferences enabling improved marketing content and international strategy (Olabode *et al.*, 2022).

*H3.* Customers intelligence positively affects DMCs.

Market intelligence indicates the ability to forecast market trends and gather information for appropriate marketing actions (Pham *et al.*, 2017). Recognizing opportunities, market changes and environmental dynamics (Falihat *et al.*, 2020) can help businesses to achieve marketing goals (Morgan *et al.*, 2018). Market intelligence enables SMEs to predict and respond to market changes with appropriate marketing actions (Falihat *et al.*, 2020). It encourages market innovativeness, brand engagement, and superior organizational performance (Liu, 2022). Market intelligence significantly improves the digital presence by capturing relevant knowledge (Wang, 2020). It offers firms with sufficient information about target markets and marketing strategy (Bıçakcıoğlu-Peynirci, 2023). AI models are valuable for collecting market data, such as competitor activities, product launches, changes in legislation, and new market entrants (Paschen *et al.*, 2019) to appropriate digital marketing. Market intelligence capitalizes on market opportunities, enabling firms to reconfigure their resources (Ali *et al.*, 2023) with a digital marketing mix.

*H4.* Market intelligence positively affects DMCs.

Digital marketing relies on digital platforms and technologies to implement marketing strategies aimed at attracting potential customers (Morgan *et al.*, 2018). The integration of content generated during customer interactions on digital platforms can substantially enhance the effectiveness of digital marketing strategies (Al-Surmi *et al.*, 2022). Digital content can be adjusted, personalized, or prioritized based on observed customer behaviors (Dam *et al.*, 2019) gradually leading to innovation. The ability to respond promptly to market dynamics can lead to new market offerings (Varsha *et al.*, 2021) by incorporating real-time data with diverse data sources (Mariani *et al.*, 2022) in international markets. Marketing capabilities are important in establishing a unique market presence (Gupta *et al.*, 2021) by comprehending the needs of customers and repositioning to market competitors (Borges *et al.*, 2021). Marketing capabilities enable organizations to target the appropriate markets, select promotional strategies and distribution channels, and develop products and brands (Cake *et al.*, 2020). Digital marketing solutions have demonstrated improvements across business model decisions, new product development, communication strategies, advertising and marketing strategy (Vlačić *et al.*, 2021). Online engagement with customers can expedite the internationalization processes of SMEs and reduce their reliance on third-party distribution channels (Tolstoy *et al.*, 2021). Big data allows real-time marketing, enabling firms to engage customers without affecting their browsing experience (Gupta *et al.*, 2021). Data analytics enable SMEs to target the right audiences with the right message at the right time and in the right language (Gkikas and Theodoridis, 2019). Innovation stems from the generation of creative ideas or novel marketing offers, ultimately offering a competitive advantage derived from market analytics (Wong and Ngai, 2023).

H5. DMCs positively affect value-chain innovation.

H6. DMCs positively affect international market strategy.

Collaboration and leveraging digital capabilities are essential for fostering innovation (Wu *et al.*, 2022). The more a firm innovates products and services aligning with customer needs and expectations, the greater its competitive success (Mikalef *et al.*, 2023). Digitalization not only affects processes but also influences the value-chain through operational innovations (Sahut *et al.*, 2020). Digitalizing offerings enable firms to achieve value-chain innovation leading to higher competitiveness. Essentially, companies with strong DMCs tend to be more innovative, and these capabilities affect their marketing strategies (Liu *et al.*, 2020). Information sharing supports firms to collaborate in dynamic markets so they can adjust to new changes (Xu *et al.*, 2018). Digital capabilities help to adapt or standardize market offerings to better meet the customers (Wang, 2020) through collaboration and co-creation (Wu *et al.*, 2022). To achieve growth, companies must adapt to current and future customer needs, leading to strategic changes in their international market position (Olabode *et al.*, 2022).

H7. Value-chain innovation positively affects international market strategy.

Digital platforms are important for value propositions, enabling firms to manage information and promote engagement (Caputo *et al.*, 2022). Digital technologies influence the internationalization of SMEs and provide information to understand social dynamics (Caputo *et al.*, 2022) and can challenge these understandings. Digitalization presents opportunities and challenges for CCI due to differences in the digital culture in different regions (Snowball *et al.*, 2021). International marketers should consider these differences in devising digital marketing strategies (Katsikeas *et al.*, 2020). Culture and digital culture are increasingly intertwining and evolving, shaping our experiences in tandem (Uzelac, 2015). It is indicated that societies with collectivist cultures are prone to Internet browsing and have more tendencies to participate in online activities (Jiao *et al.*, 2018). Whereas the access to information and digital platforms varies from space to space (Dey *et al.*, 2020). Multi-lingual digital interaction as international strategy can enhance consumers experience and

engagement (Caputo *et al.*, 2022). Empirical characterization of digital touchpoints is important in the user's decision-making journey (Diaz *et al.*, 2022). The regulatory structure concerning digital information varies and can be "complexity different" (Dwivedi *et al.*, 2019), ensuring the compliance with regulatory framework. Along with these, some digital platforms (social or e-commerce) are not accessible in certain countries which compels us to investigate its boundary effect on value-chain innovation and marketing strategy.

*H8.* Diverse digital culture positively moderates the relationship between DMCs, value-chain innovation and international market strategy.

### 3. Methods

In terms of philosophical stance, positivist's stance can be observed, as positivism allows to perform cross-sectional quantitative survey-based study and objectively examine the hypotheses which proposed on the basis of the theoretical model (Awais *et al.*, 2022).

#### 3.1 Data collection

The primary survey was conducted to evaluate the proposed model as reported in section 2, by utilization of both paper-based and electronic survey methods. Along with only 13 paper-based responses, the authors used [www.wjx.cn](http://www.wjx.cn) for digital data collection, as it is one of the renowned data collection platforms in the region, and has been used in several academic research initiatives (Sajjad *et al.*, 2024). The authors collected 368 complete responses by using a random sampling method, after identifying the eligible firms in the exhibition authors approached potential participants with the request to participate in the survey at their convenience (either paper-based or digitally, and whether respondents prefer to fill the study during the exhibition or after the event). However, the authors haven't chosen any certain criteria to exclude or include potential participants. Specifically, we attended the 19th China International Cultural Industries Fair, Shenzhen, 2023. We gathered responses from (1) high-ranking management and marketing executives of the existing cultural and creative industries (2) those who have a digital presence (e-commerce) and (3) those currently or willing to use their own- or third-party AI support, i.e. for various aspects of business intelligence, including market intelligence, search engine optimization and content creation. Cultural and creative sectors include creativity, Culture, Advertising, Architecture, Art, Design Services, Fashion, Television, Film, Publishing, Media, News, Software, Information Services, Leisure and Entertainment, Games, Animation, and Radio (Creative Economy Outlook 2022). At the beginning of the survey, the brief purpose and nature of the research, data usage for academic research, ethical declaration, assurance of the anonymity of the response, and volunteer nature of participation were communicated with the targeted respondents from SMEs within the defined areas of CCIs sector. We provide the above information to all the respondents to avoid social desirability bias (Azfar *et al.*, 2023).

#### 3.2 Instrument

Initially, we gathered demographic information and assessed the perceived value of e-commerce and AI in a descriptive manner, as illustrated in Table 1. To avoid instrumental reliability, the authors adapted the instrument from the existing literature. However, authors contextualized each of the adapted instruments according to the scope of the research. We tailored these instruments to measure BDAI, intelligent process recommendations, customer intelligence, and market intelligence from contributions by Bag *et al.* (2021a), Tolstoy *et al.* (2022), Falahat *et al.* (2020), De Luca *et al.* (2021), and Akter *et al.* (2022). The instrument to map DMC and diverse digital culture adapted from the research work of Tolstoy *et al.* (2022), Wang (2020), Ragnedda *et al.* (2022), Wang *et al.* (2023), and Xiao *et al.* (2020). The scale to

**Table 1.** Demographics

Characteristic	Detail	Freq.	In percentage
Gender	Male	214	58.15
	Female	154	41.85
Age	Under 25	109	29.63
	25–35	173	47.00
	Above 35	86	23.37
I believe that AI will have a significant role in the future trends in the industry	Yes	327	88.85
	No	41	11.15
e-commerce plays a significant role in market penetration and growth	Yes	355	96.50
	No	13	03.50

**Source(s):** Authors' own creation

measure value-chain innovation and international market strategy has been adapted from [Wu et al. \(2022\)](#), [Xiao et al. \(2020\)](#), [Falahat et al. \(2020\)](#), [Sáenz et al. \(2022\)](#), [Akter et al. \(2022\)](#) and [Al-Surmi et al. \(2022\)](#).

While measuring the adapted instruments, a five-Likert Scale was used where respondents rated their responses over the continuum of 1–5 where 1 marked as strongly disagree to 5 as strongly agree. As the instrument was adapted from the existing literature, three experts from the field of e-commerce and marketing were invited to determine content validity. Minor changes were performed as per their advice and suggestions prior to proceed further. As the target population was from Mainland China, the instrument was translated into Mandarin during the instrument development process with the help of volunteers having translation expertise in Mandarin and English, where the back translation method was adopted as advised by [Brislin \(1970\)](#). The content of both Mandarin and English instruments was compared and revised to eliminate the risk of instrumental reliability. A pilot test was also conducted on twenty-five respondents to measure instrumental validity. Authors initiated the formal data collection process, after assuring the instrument's content and face validity from the pilot test.

## 4. Analysis and findings

### 4.1 Normality, common method bias and multicollinearity

To access the data normality, SPSS Statistics v29 has been used. Firstly, the kurtosis computed to measure the tailed-ness of the collected data. Kurtosis scores were noted within the recommended threshold. Secondly, as a single mode of data collection was adopted, to eliminate the risk of common method bias, Harman's single-factor testing performed. The maximum variance explained by a single-factor noted as 23.54% which is under the acceptable range of <50%, as advised by [Podsakoff et al. \(2003\)](#) and adopted by [Zafar et al. \(2021\)](#), [Ye et al. \(2022\)](#), [Sajjad et al. \(2020, 2024\)](#). Along with Harman's approach, [Song et al. \(2019\)](#) recommended an approach to measure Common Method Bias (CMB) also tested. Specifically, the authors computed and compared the regression results, with and without (Common Latent Factor (CLF). However, the results reported no significant difference. In other words, no difference higher than 0.20 was noted. Therefore, the risk of Common Method Bias (CMB) was eliminated from the study. Finally, the Variance Inflation Factor (VIF) in the case of each item is computed. The findings concluded that VIF is within the range of 1.15–2.75, which can be considered in the acceptable range, as suggested in the existing literature ([Hair et al., 2019](#)). Thus, we can state that the collected data eliminated the risk of skewness, common method bias and multicollinearity.

4.2 Measurement model evaluation

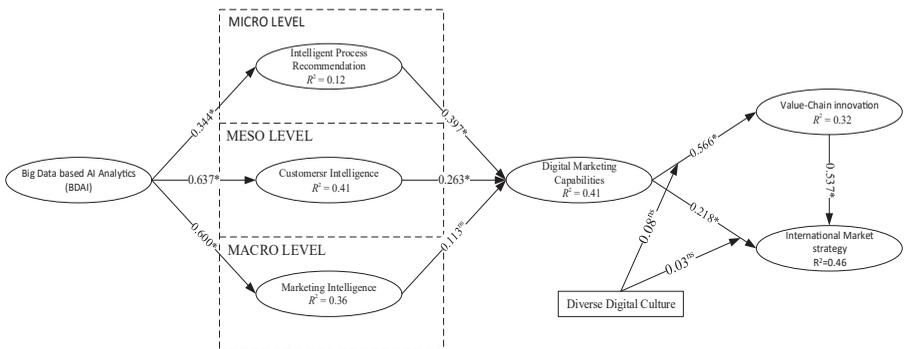
By utilizing SPSS Statistics v29, authors examined the exploratory factor analysis where the factor loading of each item, composite reliability, average variance and Cronbach’s alpha of constructs were computed. Each of the recorded values as a part of exploratory factor analysis along with acceptable cutoffs from existing literature are listed in Appendix 1. Since the results of Exploratory Factor Analysis (EFA) were noted within acceptable ranges, it can be concluded that the proposed constructs are internally reliable. To evaluate the external reliability, Fornell and Larcker’s method (Henseler et al., 2014), and Henseler approach were adopted. During Fornell and Larcker’s method to examine discriminant reliability, the inter-constructs correlation scores were computed which are advised to be lower than the square root of constructs’ Average Variance Extracted (AVE)s. The satisfactory result recorded in the current research is shown in Appendix 2.

Moreover, Henseler’s approach was also tested, where the ratio of the average inter-construct correlation for hetro- and mono-trait indicators was computed, which is advised to be lower than 0.85 in the case of inter-constructs cases. The satisfactory results were computed, as reported in Appendix 3. Therefore, the discriminant reliability of collected data is confirmed.

By utilizing SPSS AMOS v29, confirmatory factor analysis (CFA) was performed, to compute model fit indices as saturated level. The findings indicated satisfactory scores for the model fit indices at the saturated level, as advised by Hu and Butler (Hair et al., 2019). The results included Chi-square = 181.841, degree of freedom = 128, Chi-square/degree of freedom = 1.42, Comparative fit score = 0.956, Tucker–Lewis score = 0.943, and RMSEA = 0.033.

4.3 Structural model evaluation

In the case of structural modeling, acceptable fitness indices were also reported. The results included Chi-square = 194.530, degree of freedom = 126, Chi-square/degree of freedom = 1.54, Comparative fit score = 0.951, Tucker–Lewis score = 0.940, and RMSEA = 0.039. The proposed model contributes interesting findings in terms of the predictive power of the model. Specifically, the R<sup>2</sup> of DMCs, value-chain innovation, and international market strategy was noted as 0.410, 0.326, and 0.465 respectively. In terms of structural path analysis, all proposed hypotheses reported as significant: H1(a): β = 0.344, ρ ≤ 0.001, H1(b): β = 0.637, ρ ≤ 0.001, H1(c): β = 0.600, ρ ≤ 0.001, H2: β = 0.397, ρ ≤ 0.001, H3: β = 0.263, ρ ≤ 0.001, H4: β = 0.113, ρ ≤ 0.01, H5: β = 0.566, ρ ≤ 0.001, H6: β = 0.218, ρ ≤ 0.001 and H7: β = 0.537, ρ ≤ 0.001. The graphical representation of the path analysis is shown in Figure 2, and results in tabular format are listed in Table 2.



Note(s): \* = p ≤ 0.05

Source(s): Authors’ own creation

Figure 2. Structural path analysis

**Table 2.** Structured path analysis

Effect	Original coefficient	Standard bootstrap results			Cohen's $f^2$	
		Mean value	Standard error	$t$ -value		
BDAI→IPR	0.344	0.0343	0.070	4.868	0.000	0.134
AAS→CI	0.637	0.635	0.049	12.846	0.000	0.684
AAS→MI	0.600	0.599	0.054	11.001	0.000	0.564
IPR→DMC	0.397	0.392	0.077	5.113	0.000	0.196
CI→DMC	0.263	0.257	0.078	3.308	0.001	0.072
MI→DMC	0.113	0.122	0.090	1.257	0.209	0.019
DMC→VCI	0.566	0.565	0.056	10.081	0.000	0.472
DMC→IMS	0.211	0.214	0.073	2.869	0.004	0.056
VCI→IMS	0.537	0.533	0.064	8.342	0.000	0.365

**Source(s):** Authors' own creation

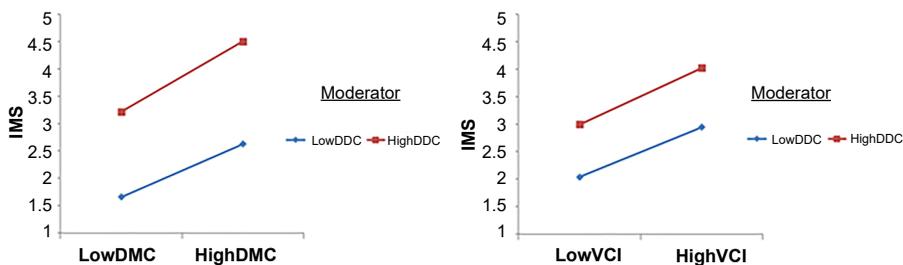
#### 4.4 Moderation and mediation testing

To test the proposed moderating effect of diverse digital culture on the relationship between DMCs, value-chain innovation and international market strategy, authors used the PROCESS macro in SPSS Statistics v29. The findings conclude that the moderator noted as insignificant for the relationship between DMC, value-chain innovation (H8a:  $\beta = 0.080$ ,  $\rho \geq 0.05$ ) and international market strategy (H8b:  $\beta = 0.031$ ,  $\rho \geq 0.05$ ). The graphical representation of the interaction effect in the case of proposed moderation (H8a and H8b) is shown in Figure 3.

Preacher and Hayes's approach was adopted to assess the mediating role of DMCs while underlining the connection of AI-driven organizational practices at the micro, meso and macro levels with perceived value-chain innovation and perceived international market strategy.

Carolina *et al.* (2004) recommended the Preacher and Hayes approach adapted to assess the mediating role of DMCs. The mediation applied to the relationships between AI-driven organizational practices at the micro, meso and macro levels with perceived value-chain innovation and international market strategy. The authors applied the bootstrapping sampling method (size:5,000) to measure confidence intervals. Results concluded that the mediation exists in H9 and H10, as no reading of confidence interval included 0 within its lower and upper caps as reported in Table 3.

Besides bootstrapping, Baron and Kenny (1986) recommended method also adopted, where series of regression analysis performed to examine further the mediating effect. The results are reported in Table 4. Specifically, the role of DMCs noted as partial mediator in case of H9 and H10, and stayed in line with the findings from the findings from bootstrapping method.



**Source(s):** Authors' own creation

**Figure 3.** Interaction plots of perceived "diverse digital culture" as moderator with the (a) positive relationship between "digital marketing capability" and perceived "value-chain innovation", and with the (b) relationship between "digital marketing capability" and "international market strategy"

**Table 3.** Results for bootstrapping method for mediation

Hypo	IV	M	DV	Effect of IV on M (a)	Effect of M on DV (b)	Direct (c')	Indirect (a*b)	Total effect (c)	95% (CI)	Mediation
H(a)	IPR	DMC	VCI	0.532***	0.465***	0.105*	0.248***	0.353***	0.170–0.343	Supported
H(b)	CI	DMC	VCI	0.482***	0.331***	0.406***	0.159***	0.565***	0.096–0.248	Supported
H(c)	MI	DMC	VCI	0.446***	0.368***	0.349***	0.164***	0.514***	0.104–0.246	Supported
H(a)	IPR	DMC	IMS	0.532***	0.355***	0.186***	0.188***	0.375***	0.113–0.288	Supported
H(b)	CI	DMC	IMS	0.482***	0.284***	0.366***	0.137***	0.137***	0.750–0.224	Supported
H(c)	MI	DMC	IMS	0.446***	0.284***	0.392***	0.127***	0.518***	0.067–0.202	Supported

**Note(s):** \*\*\*,  $p \leq 0.001$ ; \*,  $p \leq 0.05$   
**Source(s):** Authors' own creation

**Table 4.** Results for bootstrapping method for mediation

Hypo	IV	M	DV	IV→DV	IV→M	IV + M→DV		Mediation
						IV→DV	M→DV	
H(a)	IPR	DMC	VCI	0.353***	0.532***	0.105***	0.465***	Partial
H(b)	CI	DMC	VCI	0.565***	0.482***	0.406***	0.330***	Partial
H(c)	MI	DMC	VCI	0.446***	0.446***	0.350***	0.365***	Partial
H(a)	IPR	DMC	IMS	0.375***	0.532***	0.186***	0.355***	Partial
H(b)	CI	DMC	IMS	0.503***	0.482***	0.366***	0.284***	Partial
H(c)	MI	DMC	IMS	0.518***	0.446***	0.391***	0.284***	Partial

**Note(s):** \*\*\*.  $p \leq 0.001$ ; \*.  $p \leq 0.05$   
**Source(s):** Authors' own creation

## 5. Discussion and conclusion

We examined 11 hypotheses indicating the proposed relationships between variables in relation to four research questions and found support for ten hypotheses. We conceptualize H1 (H1a–H1c) to capture the effect of BDAI on intelligent process recommendations, customers' intelligence and market intelligence as postulated in RQ1. The results provide statistical support for the proposed positive relationships where the highest magnitude is observed for customers' intelligence followed by market intelligence and intelligent process recommendations. The findings validate the inclusion of intelligent process recommendations for our study, which has been overlooked by studies analyzing the big data affordance for organizational performance in the digital era by [De Luca et al. \(2021\)](#) and [Aker et al. \(2022\)](#). The findings are aligned with [Mogaji et al. \(2021\)](#), [Chintalapati and Pandey \(2022\)](#), and [Bag et al. \(2021b\)](#). This also indicates that SMEs in China want to utilize BDAI profoundly to get customer-related information, patterns and market trends. The next phase of the RQ1 hypothesized H2 to H4 to examine the effects of BDAI affordances on DMCs. The results statistically support the proposed relationships with significance observed for intelligent process recommendations followed by customer intelligence and market intelligence. The statistical robustness validates the inclusion of this variable in the model endorsed by informal discussions with executives and marketing managers. The results are in line with [Chatterjee et al. \(2022a, b, c\)](#), [Bruce et al. \(2023\)](#), [Onofrei et al. \(2022\)](#) and [Vrontis et al. \(2022\)](#) indicating the transformative role of intelligent recommendations on decision-making, marketing resource allocation and planning. The relatively weak effect of market intelligence can be understood with the high explanatory power of customer intelligence. This is somewhere tangled and provides information of market and business patterns, where some studies have utilized these concepts as first-order variables ([Aker et al., 2022](#)). Another explanation for the high significance of customer intelligence may rest with the nature of the CCI, where most individuals are interacting digitally for cultural and creative needs. The proposed variables significantly explain the effective DMCs which indicates that these variables hold explanatory power to assert DMCs in the case of SMEs in CCI.

In relation to RQ2 and RQ3, the model highlights the role of DMCs in delivering the value-chain innovation, i.e. collaborated experience, co-creation along with the appropriate market strategy for the targeted international market. The results are aligned with [Kim et al. \(2016\)](#), [Cake et al. \(2020\)](#), [Vlačić et al. \(2021\)](#), and [Tolstoy et al. \(2021\)](#) indicating the influential role of marketing capabilities on firms' performance in international markets, new product development, communication strategies, advertising, marketing strategy and engaging with customers to expedite the internationalization processes. DMCs partially mediate the effect of micro, meso and macro BDAI-enabled knowledge and resources on value-chain innovation and international market strategy. It clearly indicates that the insights from internal and external knowledge on operations and resource allocation are useful in aligning the DMCs to engage customers for collaboration, co-creation and updating processes which provide

strategic advantage to SMEs in the international market. DMCs pertain to a firm's ability to use digital technology-enabled processes to interact with customers and partners in a targeted, measurable and integrated manner to create new forms of value, irrespective of distance or time (Homburg and Wielgos, 2022). These capabilities represent a firm's ability to adapt its resource structure and develop new skills to engage with stakeholders in real-time (Wang, 2020). Essentially, digital marketing involves firms collaborating with customers and partners to jointly create, communicate, deliver and sustain value for all stakeholders to facilitate digital coordination with suppliers and channel members, customer engagement, as well as marketing to meet the needs of business firms and their stakeholders (Liu, 2022).

The third phase of the model investigates the appropriation of value-chain innovation in controlling international market strategy in relation to RQ4 and the boundary effect of the diverse digital culture in relation to RQ5. The results indicate that value-chain innovation significantly explains the international market strategy. These results are in line with Xie *et al.* (2019), Liu *et al.* (2020), Wu *et al.* (2022), İpek (2021), Olabode *et al.* (2022), and Wang (2020) indicating international market strategy encompasses the relational capabilities and plan of actions designed to enhance cross-border collaborate and co-create to achieve growth, companies must adapt to current and future customer needs, leading to strategic changes in their international market position. The moderating role of the diverse digital culture is noted as insignificant in the case of the relationship between DMCs, value-chain innovation, and international market strategy. The magnitude appears to be marginally strong but positive indicating data from different touchpoints as a useful resource for CCI managers in value-chain innovation. The strengthening effect indicates that the managers of SMEs do not perceive diversity between digital touchpoints, technology access, and technological infrastructure in the host country as hindering factors or standard structure of BDAI-enabled effective DMCs inform managers when to interact, where to interact and how to interact with customers. The insignificant effect on international market strategy behooves us to investigate this relationship in the future.

### 5.1 Theoretical implications

The study provides theoretical implications that can benefit SMEs in this sector and other sectors and allow academicians and policymakers to have a better understanding of the relationship between BDAI affordances, digital marketing, and internationalization. First, the study investigates and validates the role of BDAI and its affordances to exploit internal and external knowledge to complement DMCs of the SMEs in CCI which then directly affects their international visibility. This is particularly relevant for researcher who are interested in exploring the effects of digitalization on SMEs in emerging sectors and may assist in comprehending the collaboration between regional SMEs.

Second, the study validates the intelligent process recommendations as a construct to investigate the role of data in the international market and digital context. It reflects that the BD and AI not only provide external knowledge but also provide operational intelligence from inside the organization for effective DMCs. This would be interesting to explore the effects of this construct for reconfiguring the digital capabilities and competencies of SMEs in their digital transformation journey, particularly when these recommendations are provided by shared digital platforms and systems.

Third, the study highlights the mediating role of DMCs in explaining the effect of BDAI affordances in the international market and engaging customers. The study highlights these capabilities as dynamic capabilities which enhance the effectiveness and efficiency of the SMEs in international market and allow existing and potential pool of customers to collaborate and innovate. The study validates DMCs as a mediating factor rather than an antecedent of performance in the digitalized global market.

Fourth, the study characterizes the international performance into value-chain innovation and international marketing strategies which it assumes to be adaptive to cater to customer and

operational needs. We validate the effect of value-chain innovation in strengthening international marketing strategies, which certainly provide a competitive advantage to SMEs in a highly digitalized environment. Researchers can investigate value-chain innovation as the new avenue for firms involved in internationalization rather than exploration-exploitation or differentiation perspective.

Lastly, the study also highlights the boundary effect of diverse digital culture in international markets for SMEs as a challenge along with numerous benefits of internationalization. We encourage researchers and academicians to investigate this factor to enhance the understanding of socio-political dynamics along with market dynamics in international markets. More literature on this variable could enhance the comprehension not only in internationalization but also help to capture the performance of rural SMEs and businesses.

### *5.2 Practical implications*

Along with theoretical implications, the study also highlights the important role of BDAI in enhancing internal and external knowledge exploration to update processes, customers' patterns identification, and business opportunities in the market, which indicate BDAI as useful resource for SMEs to get a competitive advantage in dynamic business environments. We encourage managers to focus on digitalization as a strategic management resource to complement their strategic position and to identify emerging opportunities in international markets. Managers of SMEs should adopt a holistic approach toward digitalization by incorporating data both from internal and external sources to acquire resources for long-run advantages with cost-effective and consumer aligned campaigns.

Secondly, SMEs should focus more on operational intelligence to update the process and decision-making for resource allocation and other related operations. This is particularly important as most SMEs fail due to their inability to update the internal mechanism with the external operations. This requires SME managers to constantly train employees to successfully transform the database information into operational processes and functions. The innovation along the value-chain enhances agility and the ability to quickly adapt to market dynamics. This also informs academics, policy executives and market stakeholders to create a friendly regulatory environment for SMEs to cope with disruption caused by digital technologies and to tap digital dividends at domestic and international levels.

Third, the study emphasized that the BDAI-powered DMCs as dynamic capabilities that can help SMEs target potential customers, retain existing customers, handle market requirements and reposition firms to gain competitive advantage in order to expand their global digital footprints. Managers must invest in digital data techniques and systems to strengthen innovation at process, product and marketing levels to gain a competitive market advantage. BDAI insights help to comprehend international consumer behavior, and competitive and regulatory environments for increased global market presence and revenue growth.

Fourth, SMEs should promote an adaptive international market strategy as it provides SMEs more room to accommodate market dynamics and customer needs to strengthen the innovation characteristics of the digital business model. This will allow SMEs to adopt a proactive approach to anticipate market trends and consumer needs. Innovation along the value-chain not only transforms BDAI knowledge into dynamic digital capabilities to support the digital economy but also promotes the learning culture necessary for innovation hubs and entrepreneurial activities.

Finally, the findings encourage policymakers in the emerging markets to support SMEs particularly SMEs in peripheral regions in strengthening digital capabilities to successfully adopt digitalization and to contribute to the digital economy and regional economic development. In this regard, policymakers can provide avenues for capability development, e.g. cross-border e-commerce framework, digital infrastructure, capacity-building workshops and incentives for upskilling in the digital domain. The technology developers can provide guidance on learning and adopting these technologies, making the real-time interaction experience more personalized and engaging.

### 5.3 Limitation and future research

Effective digital capabilities enable SMEs, lacking extensive knowledge and financial resources, to compete with larger competitors by facilitating market intelligence gathering, reducing marketing costs, enhancing new product development, and ultimately fostering competitive advantage. The use of technology in marketing efforts and business practices by marketing goods, services, information and ideas via the Internet, cell phones, display advertisements, and other electronic media,” is an integral part of digital transformation (Bruce *et al.*, 2023), which encompass a wide array of skills, web analytics, marketing automation, and digital marketing (Wielgos *et al.*, 2021). We examine the interplay between digital resources, i.e. BDAI, internal and external knowledge at the micro, meso and macro levels, and DMCs, which further explain value-chain innovation and international market strategy. The study indicates a significant effect of intelligent process recommendation at the micro level, DMCs, and value-chain innovation in explaining international market strategy. The findings of the study are limited to SMEs in CCI in China and they must be interpreted with caution. Second, the study incorporates KBV and DCV which has limited implications given internal and external resources. The data are not longitudinal and differences may occur when a longitudinal approach is adopted. The study can be improved with Systematic Literature Review (SLR) and bibliometric insights to highlight the construct development. The future study can use a comparative study of BDAI adoption in domestic and international markets. A cross-sectional study can enhance the generalizability of the proposed model. The future can incorporate insights from CCIs working in different regions of the globe to have a holistic view of the global CCI industry.

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(The Appendix follows overleaf)

**Table A1.** EFA and reliability testing**580**

Construct	Items	Labels	Loadings	Cronbach's alpha	Composite reliability	Average variance Extracted
BDAI	BDAI1	Enables to integrate internal and external data for value analysis business environment	0.961	0.962	0.962	0.894
	BDAI2	Enables access to unstructured and structured data sets for operational efficiency	0.943			
	BDAI3	Provide advanced analytical techniques for enhanced capabilities in decision-making and sales	0.933			
Intelligent process recommendations (IPR)	IPR1	Analytics allows to provide real-time marketing solutions	0.987	0.974	0.974	0.927
	IPR2	Analytics allows to implement real-time decision-making effectively	0.981			
	IPR3	Analytics allows to integrate data in internal operations from multiple sources	0.919			
Customer intelligence (CI)	CI1	Enhances ability to learn quickly about changes in export customers' preferences	0.970	0.978	0.970	0.916
	CI2	Enhance ability to learn quickly about changes in demand and tastes of foreign customers	0.971			
	CI3	Enable to detect opportunities in areas where customers hardly express their needs	0.965			
Market intelligence (MI)	MI1	Enhances ability to quickly know about changing trends in foreign markets	0.876	0.907	0.907	0.766
	MI2	Enhances ability to learn quickly about changes in competitors' strategies	0.886			
	MI3	Enhances ability to learn quickly about changes in regulations of foreign markets	0.863			

*(continued)*

Table A1. Continued

Construct	Items	Labels	Loadings	Cronbach's alpha	Composite reliability	Average variance Extracted
Digital marketing capability (DMC)	DMC1	The ability to develop effective digital marketing communication for export	0.932	0.908	0.981	0.927
	DMC2	The ability to skillfully use real-time analytics	0.971			
	DMC3	Develop digital competence to enhance customer experience	0.964			
	DMC4	Analytical insights allow us to identify patterns and o behavior across our digital touchpoints	0.983			
Diverse digital culture (DDC)	DDC1	It is very difficult to forecast digital technology applications in foreign markets	0.945	0.899	0.950	0.825
	DDC2	There are many diverse digital touchpoints that impact our operations	0.892			
	DDC3	There exists diversity in digital resources	0.901			
	DDC4	Evolving digital technologies make operations complicated	0.894			
Value-chain innovation (VCI)	VCI1	The ability to develop new products/services for foreign markets	0.925	0.949	0.948	0.860
	VCI2	Successful management of collaboration for product development	0.961			
	VCI3	The ability to coordinate and collaborate with our partners to achieve synergy in effectively responding to market signals	0.899			
International market strategy (IMS)	IMS1	Enables to quickly respond to changes in customer demand in the international market to acquire new customers	0.940	0.949	0.949	0.861
	IMS2	Establishing product presence in the international market by expanding digital footprints	0.939			
	IMS3	Enables to adjust to marketing offerings to enhance revenue	0.906			

**Note(s):** The recommended value for acceptable factor loadings, Cronbach's alpha and composite reliability is  $\geq 0.70$  (Hair *et al.*, 2019)

The recommended value for average variance extracted is  $\geq 0.50$  (Hair *et al.*, 2019)

**Source(s):** Authors' own creation

**Table A2.** Discriminant validity testing

Construct	AAS	OI	BPR	MI	EMC	VCE	IMS	EST
BDAI	<i>0.941</i>							
IPR	0.118	<i>0.962</i>						
CI	0.406	0.162	<i>0.957</i>					
MI	0.360	0.257	0.371	<i>0.875</i>				
DMC	0.260	0.314	0.241	0.225	<i>0.962</i>			
VCI	0.436	0.154	0.368	0.331	0.320	<i>0.908</i>		
IMS	0.343	0.186	0.315	0.365	0.266	0.266	<i>0.927</i>	
DDC	0.443	0.307	0.486	0.396	0.371	0.600	0.436	<i>0.927</i>

**Note(s):** Squared correlations; Square root of AVE in the diagonal

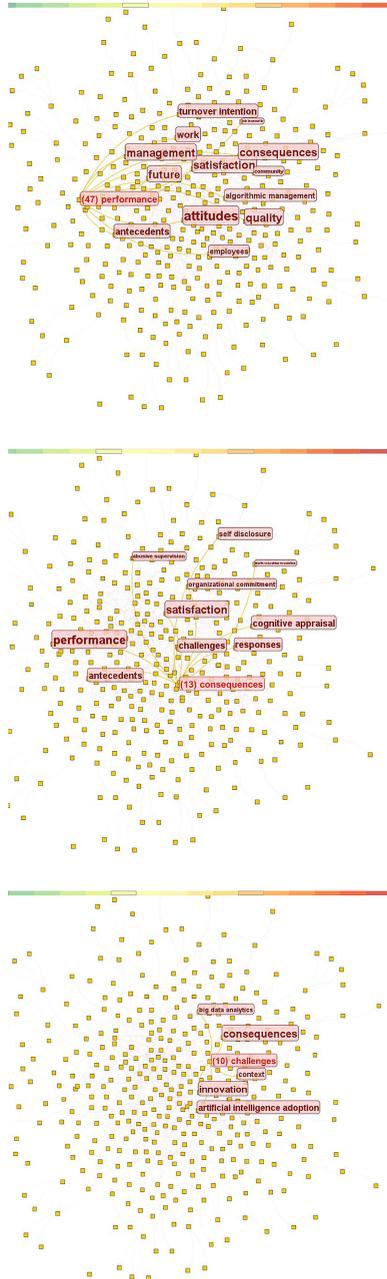
**Source(s):** Authors' own creation

## Appendix 3

**Table A3.** HTMT scores

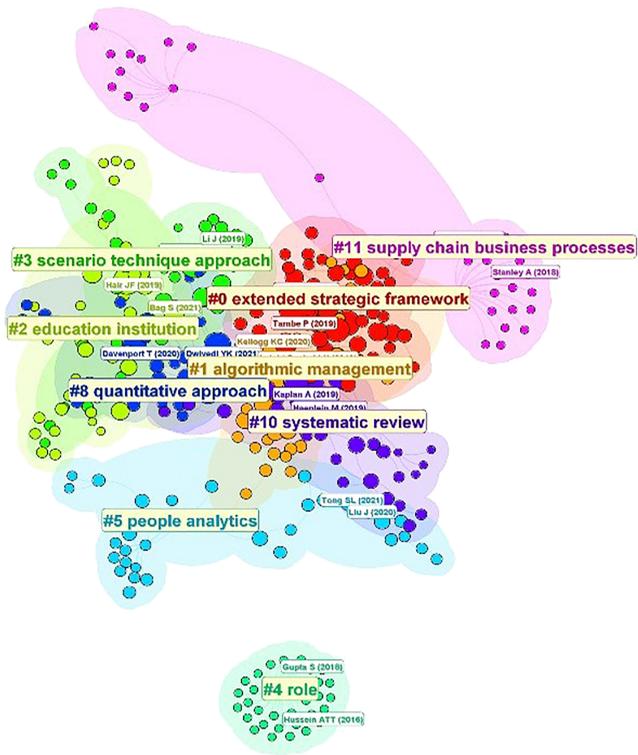
Construct	AAS	OI	BPR	MI	EMC	VCE	IMS	EST
BDAI								
IPR	0.344							
CI	0.634	0.401						
MI	0.600	0.507	0.610					
DMC	0.514	0.560	0.491	0.474				
VCI	0.660	0.393	0.607	0.576	0.565			
IMS	0.585	0.432	0.561	0.604	0.515	0.657		
DDC	0.666	0.554	0.697	0.629	0.608	0.774	0.662	

**Source(s):** Authors' own creation



Source(s): Authors' own creation

Figure A1. (a-b) Content analysis



Source(s): Authors' own creation

Figure A2. Cluster view

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