Coupling Artificial Intelligence Capability and Strategic Agility for Enhanced Product and Service Creativity

Ameen, Nisreen; Tarba, Shlomo; Cheah, Jun-Hwa; Xia, Senmao; Sharma, Gagan Deep

DOI:
10.1111/1467-8551.12797

BJM BRITISH JOURNAL of MANAGEMENT
BRITISH ACADEMY OF MANAGEMENT
British Journal of Management, Vol. 0, 1–19 (2024)
DOI: 10.1111/1467-8551.12797

Coupling Artificial Intelligence Capability and Strategic Agility for Enhanced Product and Service Creativity

Nisreen Ameen [1,2], Shlomo Tarba,[3] Jun-Hwa Cheah [4], Senmao Xia [5] and Gagan Deep Sharma [6,7]

[1]School of Business and Management, Royal Holloway, University of London, Egham Hill, Egham, TW20 0EX, UK, [2]Department of Marketing, The University of Jordan, Amman, Jordan, [3]Birmingham Business School, University of Birmingham, Edgbaston Park Road, Birmingham, B15 2TY, UK, [4]Norwich Business School, University of East Anglia, Norwich Research Park, Norwich, NR4 7TJ, UK, [5]Surrey Academy of Blockchain and Metaverse Applications, Surrey Business School, University of Surrey, Guildford, GU2 7XH, UK, [6]University School of Management Studies, Guru Gobind Singh Indraprastha University, Sector 16C, Dwarka, New Delhi, 11078, India, and [7]Lebanese American University, Beirut, Lebanon

Corresponding author email: xsenm6688@sina.com

Creativity is key for organizations' ability to remain relevant in today's disruptive world. In this paper, we identify new ways in which organizations can use artificial intelligence (AI) more effectively for creativity. Drawing on the resource-based view as a background mechanism, we developed and empirically tested a new integrative model. We collected the research data via a large survey of managers distributed to 600 organizations in China. Our findings show that coupling AI capability with strategic agility can directly support creativity. It also mediates the effects of ambidexterity, customer orientation and competitor orientation on organizations' creativity and performance when developing new products and services. In addition, our findings show that coupling AI capability and strategic agility can significantly improve firms' new product creativity and new service development performance when there is a high level of government institutional support. Our findings provide theoretical and practical implications for academics and practitioners interested in managing AI for organizational creativity.

Introduction

Creativity is critical for enabling organizations to compete in today's highly competitive global environment. Creativity can be defined as the capacity to produce ideas that are both original and adaptive or as the ability to generate new, useful and novel concepts that can be implemented in problem-solving, procedures, processes and products (Frare and Beuren, 2021). According to the resource-based view (RBV) (Barney, 2001), creativity is a critical intangible resource for organizations (Im, Montoya and Workman, 2013). In addition, creativity becomes more important for organizations focusing on improving new service development performance, as they have to deal with more complicated tasks such as delivering customized services and improving service processes (Yang, Lee and Cheng, 2016). Through undertaking such complicated tasks, managers and employees acquire knowledge of customers' changing needs and the skills to develop new service processes, making them more competent at enhancing new service development performance (Dubiel and Mukherji, 2022).

Creativity may also be linked to organizations' strategic agility (Ameen et al., 2022; Awan et al., 2022; Tarba et al., 2023), which is 'the ability of the organization to renew itself and stay flexible without sacrificing efficiency' (Junni et al., 2015a, p. 596). Strategic agility is linked to an organization's ability to invent new business models and new categories, rather than simply rearranging old products and categories (Weber and Tarba, 2014). High strategic agility in organizations is associated with stronger employee commitment and motivation, both of which stimulate creativity and the exchange of ideas for developing new products and services in the workplace (Franco and Landini, 2022). The RBV (Barney, 2001) posits that possessing resources and capabilities is not sufficient for organizations to generate value, especially in fast-paced environments (Amit

and Schoemaker, 1993; Barney, 2001). To survive in competitive markets and develop their strategic agility, organizations need to nurture related factors, such as their customer and competitor orientations and their ambidexterity; at the same time, they need to be aware of the market conditions surrounding them and be able to access the support from the government they require to survive (Ameen et al., 2022; Kurniawan et al., 2020).

In a recent survey by McKinsey (2021), 77% of senior company leaders said they believe that creativity is a critical driver for growth and financial performance. However, rapid advances in artificial intelligence (AI) and machine learning, and their integration with human intelligence (cognitive and emotional skills), are likely to be game-changers for creativity in organizations (Ameen et al., 2022). By 2025, global investment in AI is expected to reach $232 billion (Schwandt, 2019). Netflix, Spotify and Lexus are examples of organizations that have used AI for creativity, to change the mental model of their respective industries and create new mental models (Pagani and Champion, 2023). For example, Lexus produced the first filmed advertisement written entirely by AI, having trained the technology on data from 15 years of award-winning advertisements for luxury products. Generative AI such as the type used by Lexus supports creative processes by generating ideas, words or images (Branscum, 2022). ChatGPT, Jasper and Writesonic are examples of the latest form of generative AI, which shows promise for services in that it can produce original content in response to a user prompt (Ameen, Sharma and Tarba, 2023). Generative AI can help organizations build powerful, personable, personalized content and customer experiences (Branscum, 2022), which can enhance organizations' ability to be creative. A recent report has shown that among enterprises which are the most advanced in using AI and machine learning, 61% are using fully integrated product lifecycle management systems (Columbus, 2020).

When creating new products and services, teams that are more advanced in using AI achieve greater economies of scale and more efficiency and speed gains (Huang and Rust, 2021). Examples of how AI can boost organizations' creativity in this regard include forecasting demand, designing new generations of products and services, analysing and providing recommendations for continuously improving product usability, enabling the next generation of frameworks to reduce time-to-market and improving product quality and flexibility in meeting unique customization requirements (Ameen et al., 2022; Ameen, Sharma and Tarba, 2023; Columbus, 2020). Despite these creative benefits, however, 85% of AI and machine learning projects fail to produce a return for the organization (Gartner, 2022). To turn their use of AI into a success, organizations need to restructure teams, develop their AI capability by acquiring new skills and promote agility in the workforce (Mikalef and Gupta, 2021; Mikalef, Conboy and Krogstie, 2022; Pagani and Champion, 2023). An organization's AI capability is its ability to 'select, orchestrate, and leverage its AI-specific resources' (Mikalef and Gupta, 2021, p. 3). A key challenge for managers here is the need to make effective use of their resources, capabilities and external support for the process of implementing AI to ensure success of implementation internally (Pagani and Champion, 2023).

Drawing on psychological theory, most studies on creativity focus on how individuals generate, develop and react to creative ideas in certain social and contextual environments (e.g. Gu, Hempel and Yu, 2020; He et al., 2020; Liu et al., 2021; Spoelma, Mai and Wei, 2022; Zhang et al., 2022). Yet, to the best of our knowledge, there is still a significant gap in the literature in terms of how organizations can enable creativity by coupling AI capability and strategic agility, and how this may influence the effects of other related factors on creativity. In addition, although scholars have explained how external government support can affect organizations' capabilities in general (e.g. Peerally et al., 2022), they have yet to develop an understanding of how such support affects their AI capability, strategic agility and creativity more specifically.

To address these knowledge gaps, this research examines how customer-oriented, competitor-oriented and ambidextrous organizations can improve their creativity in product and service development through a coupling of strategic agility and AI capability. In addition, it identifies the role of government support in this context. We draw on the RBV (Barney, 2001) as a background mechanism to develop and empirically test a new integrative model (Figure 1).

This study makes three specific contributions to the management literature. First, it addresses the void in the existing research on how coupling strategic agility and AI capability affects product and service creativity. It contributes to the literature on strategic agility (e.g. Del Giudice et al., 2021; Junni et al., 2015a, 2015b; Shams et al., 2021; Tarba et al., 2023) by showing managers' perspectives on how combining this agility with AI capability can lead to improved creativity. It builds on the accumulated knowledge about strategic agility and responds to recent developments in the realm of digitization and AI by adding the three dimensions of AI capability (Mikalef and Gupta, 2021) to the concept of strategic agility. In addition, unlike most of the extant research on agility and creativity, which explains that creativity can make an organization more agile (e.g. Awan et al., 2022; Tarba et al., 2023), our research demonstrates the significant influence exerted by strategic agility as an enabler of creativity. Second, this study extends the findings of previous research (e.g. Kitchens et al., 2018; Kurniawan et al., 2020; Weber and Tarba, 2014; Zhang and Sharifi, 2000, 2007) by

showing the significant effects of customer orientation, competitor orientation and organizational ambidexterity on organizations' coupling of AI capability and strategic agility, which, in turn, strengthens creativity. Third, it shows managers' perceptions of the impact of external factors on organizations' creativity. This extends previous research, which highlighted the impact of government support on various aspects of business (Igalla, Edelenbos and van Meerkerk, 2020) but did not address creativity.

Theoretical background

AI capability

AI is a characteristic of 'machines that exhibit aspects of human intelligence' (Huang and Rust, 2018, p. 155) and is defined as 'the ability of a system to identify, interpret, make inferences, and learn from data to achieve predetermined organizational and societal goals' (Mikalef and Gupta, 2021, p. 3). The literature emphasizes the important positive impact of AI on organizations (e.g. Garbuio and Lin, 2021; Mikalef and Gupta, 2021). In the context of creativity, AI displays some key cognitive skills: intelligence, learning and the ability to process and analyse massive data, among others. As developments in computational speed, data storage, data retrieval, sensors and algorithms have dramatically reduced the cost of making predictions based on machine learning, some organizations have turned to AI to anticipate new trends and circumvent the cognitive limits required for creativity (Ameen, Sharma and Tarba, 2023; Shamim et al., 2023; Warner and Wäger, 2019). However, for organizations to be successful in using AI for creativity, they need to be able to utilize the relevant resources and capabilities effectively.

The RBV is a suitable theoretical lens for examining dynamic and turbulent environments, especially those that foster resource complementarity. Recent research applying the resource-based theory has highlighted that in addition to the technology itself, human and complementary organizational resources are required to leverage investment and remain competitive (Mikalef and Gupta, 2021). While *resources* are what an organization owns, *capability* is an organization's ability to bundle, manage or otherwise exploit resources in a manner that provides added value and, it is hoped, advantages over its competitors (Bowman and Ambrosini, 2003). However, the RBV is criticized for being inattentive to contexts (Yang and Konrad, 2011). Oliver (1997) has argued that neither resource acquisition nor resource deployment are independent of the institutional context. Although the RBV and dynamic capability theory have evolved from two different perspectives, they are complementary to each other because capabilities are attained through the utilization of resources (Barney, Wright and Ketchen, 2001) and organizations develop sustainable competitive advantages based on hard-to-imitate resources and capabilities (Awan et al., 2022). Dynamic capabilities are an extension of the RBV and refer to the ability of firms to create new competencies and reconfigure existing ones (Teece, 2007; Teece, Pisano and Shuen, 1997).

Dynamic capability theory stems from the premise that the RBV of the organization is static in nature and does not fully explain how an organization's resources are developed and integrated into a rapidly changing environment (Kim, Song and Triche, 2015; Teece, Pisano and Shuen, 1997). AI can underpin the building of the dimensions (sub-components) of an organization's dynamic capabilities: sensing, seizing and transforming, which are essential for maintaining competitiveness (Mikalef, Conboy and Krogstie, 2022; Warner and Wäger, 2019).

Building on the RBV and dynamic capability literature, the concept of AI capability has emerged (Mikalef and Gupta, 2021). AI capability has three main dimensions, which combine human- and AI-specific resources: (i) tangibles (data, technology and basic resources); (ii) human skills (technical and business); and (iii) intangibles (inter-departmental coordination, organizational change capacity and risk proclivity) (Mikalef, Conboy and Krogstie, 2022; Mikalef and Gupta, 2021). To develop AI capability, organizations must balance their technical and managerial skills: technical skills for handling data and implementing AI techniques and managerial skills for understanding what domain of knowledge is required when developing AI applications and envisioning important areas of use (Dwivedi et al., 2021). The intangible resources required to foster AI capability include the ability to carry out inter-departmental coordination and the capacity to initiate and effect organizational change (Mikalef and Gupta, 2021).

Coupling AI capability and strategic agility

Returning to dynamic capabilities, studies focusing on this perspective (Teece, 2007, 2018) have suggested that strategic agility is also a vital dynamic capability – and, more importantly, that organizations should act strategically to leverage value from it (Zahoor et al., 2023). The dynamic nature of strategic agility enables organizations to reconfigure their resources and capabilities in a short time frame, which allows them to be responsive and adaptable (Khan, 2020). The underpinnings of strategic agility rely on two interdependent elements of the dynamically capable organization: (i) combining technologies; and (ii) flexible structures that can be rapidly modified (Teece, Peteraf and Leih, 2016). To increase the benefits of dynamic capabilities for strategic agility, organizations must exploit digital technologies,

including AI (Magistretti, Pham and Dell'Era, 2021; Warner and Wäger, 2019). Furthermore, by exploiting AI, organizations can recombine resources, re-engineer operations and business processes and manage knowledge for creativity (Ameen et al., 2022; Ameen, Sharma and Tarba, 2023). Accordingly, the coupling of AI capability and strategic agility may bring organizations more fruitful results in terms of creativity. This coupling can also strengthen and further explain the effects of other determinants of enhancing creativity, such as ambidexterity and whether an organization has a customer orientation or a competitor orientation (Ameen et al., 2022).

Proposed model and hypothesis development

An organization's AI capability can play a central, direct role in its product and service creativity, but it can also exert an indirect influence through its impact on the organization's dynamic capabilities. Coupling an organization's AI capability and its strategic agility, which combines human and technological intelligence, may enhance the organization's creativity. For example, by providing: (i) the increased flexibility and adaptability needed to re-engineer business operations and processes; and (ii) the responsiveness required to address uncertain and evolving market demands effectively with AI (Chowdhury et al., 2023; Mikalef and Gupta, 2021).

Building on previous research (Junni et al., 2015a; Mikalef and Gupta, 2021), we refer to the concept of 'coupling AI capability and strategic agility' as an organization's ability to select, orchestrate and leverage its AI-specific resources, and to renew itself and stay flexible without sacrificing efficiency. Organizations that couple AI capability and strategic agility can gain a competitive advantage from augmentation (combining AI and human intelligence), which, especially in the realm of creativity, far exceeds the gains from human intelligence alone (Ameen, Sharma and Tarba, 2023). These organizations remain flexible and relevant in today's market. The unique benefits provided by coupling strategic agility and AI capability enable organizations to develop the right new products and services, at the right time, in the right place and at the right price. By leveraging this coupling, organizations can attain market capitalization and operational adjustment agility, which are key components of gaining a competitive advantage.

Deploying advanced technologies strengthens the effects of strategic agility by accelerating organizations' development of new products that meet nascent market opportunities, and this may determine their survival in times of crisis (Ameen et al., 2022; Mikalef and Gupta, 2021; Warner and Wäger, 2019). In addition, AI capability and strategic agility are both influenced by the macro environment surrounding an organization; for example, the government regulations and policies that support organizational operations and processes and organizations' adoption and use of AI (Igalla, Edelenbos and van Meerkerk, 2020).

Our proposed model identifies that coupling AI capability and strategic agility has a key influence on organizations' new product creativity and new service development performance. *New product creativity* is the extent to which a new product is novel and differs from its competing alternatives (Das et al., 2023; Dean, Griffith and Calantone, 2016). *New service development* refers to innovations of new services or service procedures that will make efficient operation and superior performance possible, and which are often based on novel ideas and creative solutions (Yang, Lee and Cheng, 2016).

In addition, our proposed model examines how coupling AI capability and strategic agility can strengthen the effects of determinants (i.e. customer orientation, competitor orientation and ambidexterity) related to the use of AI for creativity (Ameen et al., 2022). *Ambidexterity* is an organization's ability to simultaneously pursue exploratory and exploitative activities (Tarba et al., 2020). Ambidexterity is viewed as a dynamic capability (O'Reilly and Tushman, 2008; Vahlne and Jonsson, 2017) that can act as a significant determinant of organizations' agility and their use of AI for creativity (Ameen et al., 2022; Del Giudice et al., 2021; Tarba et al., 2023). Furthermore, customer orientation and competitor orientation play pivotal roles in determining strategic agility and organizations' use of the resources required for AI in the context of creativity (Ameen et al., 2022; Kurniawan et al., 2020). Both orientations can assist organizations with envisioning customers' changing needs, behaviours and preferences; spotting the long-term capabilities and strategies of key rivals; and generating the inter-functional coordination needed to address them appropriately (Im, Hussain and Sengupta, 2008; Kurniawan et al., 2020). Therefore, we assert that an organization's coupling of AI capability and strategic agility is determined by its ambidexterity and its orientation, and that this coupling strengthens the impact of ambidexterity and orientation on creativity. These determinants enable organizations to remain flexible, to develop AI capability without sacrificing efficiency and to respond to changing market conditions (i.e. to develop strategic agility).

Our proposed model (Figure 1) fills a gap in the literature by examining: (i) the effects of coupling of AI capability and strategic agility on organizations' new product creativity and new service development; (ii) how these effects are strengthened or weakened by the level of government institutional support; and (iii) the role of this coupling in strengthening the impact of key determinants (ambidexterity, customer orientation and competitor orientation) on new product creativity and

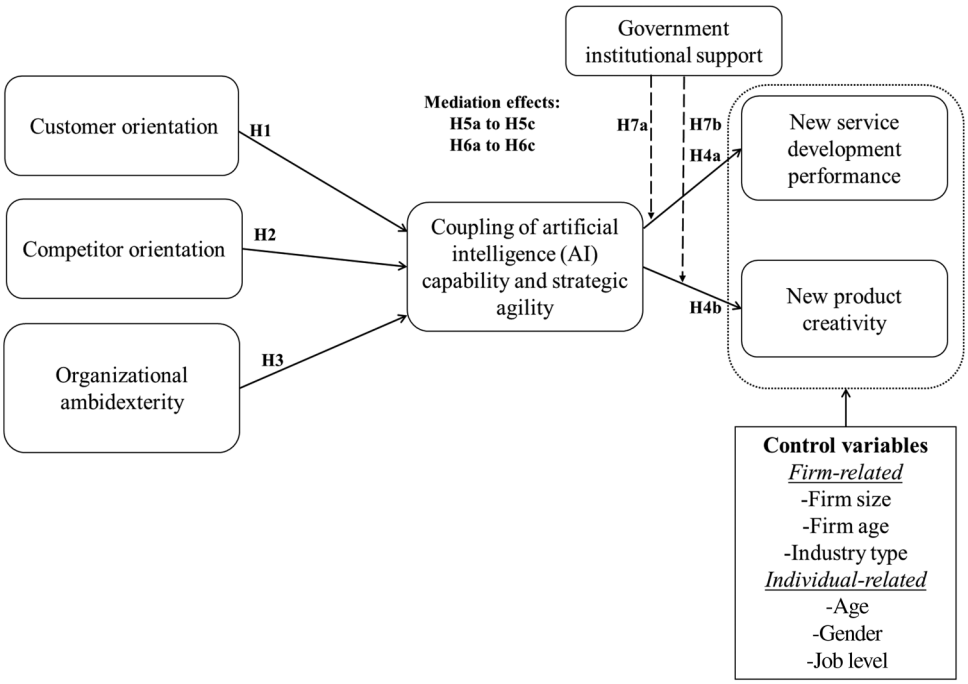

Figure 1. Proposed model

new service development. In the following sections, we present our hypothesis development.

Antecedents of coupling of AI capability and strategic agility

A customer orientation is the synthesis of obtaining information about customers' needs and preferences and taking actions based on this and other forms of customer-related market intelligence (Kopalle et al., 2022). It is also principally grounded on information (albeit historic, accumulated and after-the-fact) used to inform business decisions. Legacy firms have long employed digital technologies that help them accumulate, store and analyse information (Andreou, Harris and Philip, 2020). Hence, organizations that are more customer-oriented are more likely to value the power of AI for providing key insights and predictions about customer behaviour, needs and preferences (Ameen et al., 2022; Homburg and Wielgos, 2022; Kopalle et al., 2022; Kozinets and Gretzel, 2021).

A customer orientation also facilitates the adoption of proactive, adaptable and timely approaches by guiding employees to comprehend the demands of each customer and respond promptly (Park and Hur, 2023). Organizations that address the changing needs of customers are often more agile (Hajli et al., 2020). Furthermore, in an examination of the impact of customer data-driven culture on competitive advantage, Medeiros and Maçada (2021) identified a relationship between agility and analytical capabilities. Flexibility and promptness are widely acknowledged as key components of strategic agility (Junni et al., 2015a, 2015b). Hence, through strategic performance and innovativeness, customer orientation has a significant effect on business profitability, which leads to the idea that it may also positively impact strategic agility (Zhang and Sharifi, 2000) and AI capability (Mikalef and Gupta, 2021). Thus, we hypothesize:

H1: Customer orientation has a significant positive effect on the coupling of AI capability and strategic agility.

A competitor orientation centres on gathering and assimilating competitor-related market intelligence (Andreou, Harris and Philip, 2020). Organizations that focus on differentiating themselves from their competitors, capitalizing on their distinct strengths to deliver better value to customers in a given environment, often focus on gathering the resources and capabilities needed for a competitive advantage (Al-Surmi, Cao and Duan, 2020). When an organization's values and beliefs are directed towards gaining an edge over their competitors through their actions, they can alter the competitive structure and behaviour of the market. Competitor-oriented organizations believe that predicting future competitive behaviour and changing their competitive environment for their benefit will give them a competitive advantage (Schulze et al., 2022). The adoption of AI in a competitive domain could trigger substitution that can help in this context. For example, AI is currently used widely to automate predictions about strategic decision-making and problem-solving

tasks, which traditionally only humans had the cognitive ability to make (Krakowski, Luger and Raisch, 2023). Hence, competitor-oriented organizations are more likely to value the power of AI in enabling them to gain a competitive advantage, which makes them more likely to: (i) be more adaptable without sacrificing efficiency because they are using AI; and (ii) gather and orchestrate the resources needed to implement AI applications (Krakowski, Luger and Raisch, 2023).

A competitor orientation requires an organization to transform its strong and weak points into more creative concepts capable of eliciting customer satisfaction (Sultana, Akter and Kyriazis, 2022). It is central to corporate strategy because it: (i) provides a solid foundation of intelligence on current and potential competitors; and (ii) leads to adaptability by either leading the competition (proactive competitor orientation) or following it (responsive competitor orientation) (Schulze et al., 2022). Considering the uncertainties and escalating disruptions that exist today, strategic agility also entails the adoption of new and innovative business models to compete effectively (Weber and Tarba, 2014). Accordingly, we hypothesize:

H2: Competitor orientation has a significant positive effect on the coupling of AI capability and strategic agility.

Organizational ambidexterity theory proposes that to attain long-term success, businesses need to strike a balance between simultaneous exploration and exploitation (Hu, Dou and You, 2023). *Exploitation* reflects the current efficient management of business demands to minimize risk and usually focuses on effectiveness and efficiency in production; meanwhile, *exploration* reflects the ability to adapt to future requirements and usually focuses on experimentation, flexibility and innovation, which involve risk-taking (Katou, Budhwar and Patel, 2021). Scholars have applied the concept of ambidexterity to capture innovation activities at the organization level (Del Giudice et al., 2021; Doblinger, Wales and Zimmermann, 2022). Exploratory innovations involve the proclivity to challenge existing technological trends and search for new market opportunities and knowledge, inside and outside existing industry boundaries (Doblinger, Wales and Zimmermann, 2022). Conversely, exploitative innovations involve continuously improving existing technological knowledge to satisfy existing market needs by reducing costs and enhancing efficiency, and are more likely to be incremental (Doblinger, Wales and Zimmermann, 2022). Previous studies have indicated that having a balanced combination of exploitation and exploration activities allows organizations to gather the human, tangible and intangible resources required for developing their AI capability (Mikalef and Gupta, 2021).

In addition, according to the notion of ambidexterity, an organization's capacity to balance exploration and exploitation is crucial to its ability to adapt without sacrificing efficiency (Hu, Dou and You, 2023; O'Reilly and Tushman, 2008; Tushman and O'Reilly, 1996; Weber and Tarba, 2014). It follows that ambidexterity enables organizations to invent new business models and categories, which is key for increasing strategic agility (Weber and Tarba, 2014). Thus, we hypothesize:

H3: Organizational ambidexterity has a significant positive effect on the coupling of AI capability and strategic agility.

Direct and mediating effects of coupling AI capability and strategic agility

We propose that coupling AI capability and strategic agility will directly affect an organization's creativity. AI enables deeper data analysis (e.g. pattern analysis, identifying abnormality in variables and scenarios in uncertain conditions) and the learning of scenarios over time (Akter et al., 2021; Chalmers, MacKenzie and Carter, 2021; Shamim et al., 2023). The technological and non-technological resources that make up an organization's AI capability can act as powerful enablers of product and service creativity through augmentation (Ameen et al., 2022; Mikalef and Gupta, 2021). Developing a strong AI capability can assist an organization with managing some of the cognitive skills required for new product and service creativity; for example, intelligence, memory and processing large volumes of data (Ameen et al., 2022; Huang and Rust, 2021).

More advanced approaches to creativity involve the use of deep learning methods, which include predictive analytics, computational creativity, personalization algorithms and natural language processing systems (Huang and Rust, 2021). This, combined with the key human creative skills (e.g. intuition, judgement, risk-taking, team coordination and capacity to effect change), can strongly influence an organization's new product creativity and new service development performance. Indeed, AI can complement human performance at the various stages of the creative process: idea initiation, idea execution and final product or service (Ameen et al., 2022). Mikalef and Gupta (2021) found a direct association between an organization's AI capability and its organizational creativity. This suggests that organizations with high levels of AI capability can enhance their new product creativity and new service development performance.

New products and services are critical for customer retention and corporate growth, because they attract new customers while appealing to existing customers' desire for change or novelty (Hajli et al., 2020). Strategic agility encompasses activities performed by an

organization to create value in a turbulent and unpredictable environment (Weber and Tarba, 2014). It involves allocating sufficient resources to developing and deploying specific capabilities and balancing these capabilities in a dynamic way over time (Shams et al., 2021). The development of new products and services is enabled by an organization's strategic agility and AI capability, and it is executed by identifying and swiftly addressing emergent challenges and remaining flexible without losing efficiency. To take advantage of opportunities for developing new products and services as they arise, agile organizations remain sensitive to market change and swiftly integrate their resources, systems and processes (Millar, Groth and Mahon, 2018).

Although the literature has accounted for the role played by strategic agility in new product development to some extent (Puriwat and Hoonsopon, 2022; Shirazi et al., 2022; Škare and Soriano, 2021), it has largely focused on organizational agility (Puriwat and Hoonsopon, 2022), market agility (Hajli et al., 2020) and data analytics and digitization (Shirazi et al., 2022; Škare and Soriano, 2021). Limited attention has been paid to what impact combining AI capability and strategic agility may have on the creation of new products and services. In addition, researchers have often incorporated the function of new service development into new product development (Hajli et al., 2020; Hoonsopon and Puriwat, 2021). Therefore, we hypothesize:

H4: Coupling of AI capability and strategic agility has a significant positive effect on (a) new service development performance and (b) new product creativity.

In addition to the direct effects, we anticipate that coupling AI capability and strategic agility has significant mediating effects in our proposed conceptual model. Specifically, the coupling of AI capability and strategic agility is hypothesized to act as an intermediate channel that accounts for the effects of customer orientation, competitor orientation and ambidexterity on new product creativity and service development performance. An organization that combines its AI capability and its strategic agility is expected to be better positioned to leverage its customer and competitor orientation and its ambidexterity to develop creativity in relation to new products and services. It is also more likely to survive in challenging times because it will be able to use technology more effectively and purposefully to spark new ideas for products and services. AI can transform organizations' ability to be creative when they achieve the right balance between AI and human intelligence (Ameen et al., 2022; Ameen, Sharma and Tarba, 2023; Pagani and Champion, 2023).

Organizations with a customer-focused marketing strategy tend to integrate customer preferences into developing and marketing their products and services, because they put customers' interests first (Al-Surmi, Cao and Duan, 2020). In customer-oriented organizations, managers often make efforts to build on the AI-enabled insights gained from developing the required AI capability and listening to consumers (Kühl, Mühlthaler and Goutier, 2020). They may also experiment with diversifying their activities to propose new products and services based on customer preferences (Kopalle et al., 2022). When customer-oriented organizations combine strategic agility with AI capability, they can leverage being flexible and using the power of AI to design new products and services tailored to customers' needs.

In addition, we propose that coupling AI capability and strategic agility strengthens the effects of competitor orientation on creativity. Organizations with a competitor-focused marketing strategy seek to analyse competitors in their external market, use competitor intelligence as a frame of reference to guide their product development and marketing processes, identify their strengths and weaknesses and keep pace with or stay ahead of competitors (Al-Surmi, Cao and Duan, 2020; Schulze et al., 2022). When these organizations increase their awareness of the competition and attempt to identify new ways to differentiate their products and services (Ameen et al., 2022), they develop AI capability and strategic agility while maintaining efficiency: the human–AI collaboration and adaptability inherent in this coupling, and they can then initiate new product and service ideas that allow them to stay ahead of competitors.

Furthermore, we propose that coupling AI capability and strategic agility strengthens the impact of ambidexterity on creativity. Ambidextrous organizations that excel in both exploration and exploitation achieve superior performance (Hughes et al., 2018; O'Reilly and Tushman, 2011). When these organizations develop their AI capability and strategic agility, they can harness the power of AI and flexibility to improve their exploration and exploitation activities, leading to ideas for new products and services. Thus, we propose the following hypotheses:

H5: Coupling AI capability and strategic agility positively mediates the effects of (a) customer orientation, (b) competitor orientation and (c) organizational ambidexterity on new service development performance.

H6: Coupling AI capability and strategic agility positively mediates the effects of (a) customer orientation, (b) competitor orientation and (c) organizational ambidexterity on new product creativity.

Moderating effects of government institutional support

Government institutional support refers to the extent to which a government provides organizations with incentive schemes, financial support, policies on research and development (R&D) and patenting and plans that offset

the adverse influences of inadequate institutional infrastructures or inefficient law enforcement during political, economic and societal transitions (Sheng, Zhou and Li, 2011; Shu et al., 2019; Yi et al., 2021). Recent studies have highlighted that government institutional support has a key role to play in fostering organizations' AI-enabled innovation and R&D activities (Igna and Venturini, 2023; Lundvall and Rikap, 2022). Beraja, Yang and Yuchtman (2021) studied the role of the Chinese government as a data provider in the development of AI (facial recognition) innovations by the business sector. Regulatory interventions will impact the ability of organizations to absorb and use AI and to develop a strong capacity for both AI and creativity.

Governments have employed patent systems to foster the generation and diffusion of new ideas (Lundvall and Rikap, 2022; Shu et al., 2015). China, as the empirical context of this study, is highly relevant in that government institutional support serves as a vital means of countering the adverse effects of institutional voids in transition economies and helps organizations make effective decisions about which activities to prioritize (Albino-Pimentel, Dussauge and El Nayal, 2022). For example, China's cultural and creative industries have been commercialized and industrialized, supported by the inclusion of creative and consumer-oriented cultural items and content in the government's macroscopic guidelines (Park, 2022). The Chinese government's *New Generation Artificial Intelligence Development Plan (2015–2030)* and other policy portfolios aim to create an AI ecosystem by investing large amounts of capital, providing leading education, retaining talent, advancing fundamental research, pushing commercialization, and so forth (Cyranoski, 2018; Wu et al., 2020). We therefore hypothesize:

H7: Government institutional support moderates the effects of coupling AI capability and strategic agility on (a) new service development performance and (b) new product creativity: the relationship is stronger in the presence of strong government institutional support.

Methods

Sample and procedures

China has been recognized as one of the global leaders in AI applications (The Economist, 2017; Roberts et al., 2021). Chinese organizations are widely applying AI in the realm of creativity and innovation, driven by the big data sets produced by the gigantic Chinese market (Beraja, Yang and Yuchtman, 2021; Liu et al., 2021; Xia et al., 2023). We collected the data through a survey which included adapted questions closely related to the variables proposed in our conceptual model, which we measured on a seven-point Likert scale ranging from (1) 'strongly disagree' to (7) 'strongly agree' (see Online Appendix A for the measurement items). We translated the survey into Chinese using the standard translation and back-to-back translation procedure (Brislin, 1980) and took measures to minimize the occurrence of common method bias (see Online Appendix B).

We identified the prospective respondents for our survey from the Wen-Juan-Xing database platform: one of the largest Qualtrics-like platforms in China, with over 744,000 registered managers and 16.3 billion surveys completed by 2022. Prospective respondents had to meet two criteria: (i) to be employed by an organization using AI; and (ii) to hold a managerial position. As a preliminary test of our proposed conceptual model and questionnaire, we ran a pilot survey that yielded 57 valid responses. We then revised our questionnaire based on the feedback we received.

Subsequently, we randomly distributed the survey to the identified respondents. To establish an accurate representative sample, we collected data from one manager per firm in our study. This approach enabled us to get insights into decision-making processes at the managerial level, while minimizing potential biases arising from surveying multiple participants from the same firm (Moore, Harrison and Hair, 2021). A member of the authors' team, along with a dedicated client manager from Wen-Juan-Xing, monitored the data collection and inspected the data to ensure that only one manager from each firm completed the survey. We obtained responses from 911 managers in organizations, and then deleted 311 responses because of missing values or illogical answers. For example, some managers claimed that their firm had a good capability to change, but went on to state that they were unable to anticipate and plan for changes. Thus, our final sample included questionnaires completed by managers from 600 organizations (see Online Appendix C for a detailed explanation of the demographic information). Finally, we employed the partial least squares, structural equation modelling technique to assess the proposed research model (see Online Appendix D for a detailed explanation).

Data analysis

Measurement model

Table 1 shows that all items with loadings exceeded the 0.5 threshold (Hair et al., 2022), except for COMO4, CUSO1, CUSO4, CUSO7, CUSO8, NPC1 and SA3 to SA5. All the variables had average variance extracted (AVE) values above 0.5 and composite reliability (CR) values above 0.7 (Hair et al., 2022). This provided robust evidence for the convergent validity and internal consistency of our constructs. The outer loading values of some constructs were in the range of 0.613 to 0.700; nevertheless, these items were retained for content

Table 1. Assessment of convergent validity, internal consistency and full collinearity

Construct	Item	Loading	Composite reliability (CR)	Average variance extracted (AVE)	Full collinearity (FC)
Competitor orientation	COMO1	0.630	0.755	0.509	1.699
	COMO2	0.762			
	COMO3	0.740			
	COMO4	D			
Customer orientation	CUSO1	D	0.836	0.504	1.940
	CUSO2	0.746			
	CUSO3	0.713			
	CUSO4	D			
	CUSO5	0.725			
	CUSO6	0.709			
	CUSO7	D			
	CUSO8	D			
	CUSO9	0.655			
Government institutional support	GIS1	0.766	0.829	0.533	2.016
	GIS2	0.758			
	GIS3	0.676			
	GIS4	0.716			
New product creativity	NPC1	D	0.837	0.508	1.985
	NPC2	0.747			
	NPC3	0.613			
	NPC4	0.701			
	NPC5	0.746			
	NPC6	0.747			
New service development performance	NSDP1	0.621	0.842	0.517	2.328
	NSDP2	0.751			
	NSDP3	0.749			
	NSDP4	0.726			
	NSDP5	0.741			
Organizational ambidexterity	OAM1	0.659	0.837	0.635	2.228
	OAM2	0.849			
	OAM3	0.867			
Strategic agility	SA1	0.728	0.848	0.529	2.165
	SA2	0.750			
	SA3	D			
	SA4	D			
	SA5	D			
	SA6	0.692			
	SA7	0.791			
	SA8	0.667			

Note: D = item removed due to loading below 0.5.

validation purposes. Notably, Hair et al. (2022) suggest that if a construct achieves satisfactory values for convergent validity and internal consistency, it is not necessary to remove items with outer loadings greater than 0.50.

The discriminant validity was evaluated using the heterotrait–monotrait (HTMT) ratio method, revealing that all variables had HTMT values below the 0.90 threshold, thus discriminant validity was achieved (see Table 2).

We continued to assess AI capability as a formative–formative–formative type of higher-order construct (Becker et al., 2023; see Table 3). The VIF values fell below the 3.3 threshold, showing that the dimensions were distinct. Then, the statistical significance of the first-order constructs (the formative items) and the second-order constructs (i.e. data, technology, basic resources, technical skills, business skills, inter-departmental coordination, organizational change capacity and risk proclivity) enabled us to establish a third-order construct (AI capability) that showed statistical significance in all second-order constructs or dimensions (i.e. tangible, human and intangible) ($p < 0.05$). A global item was developed and assessed, and the redundancy analysis result showed a path coefficient value of 0.891, higher than the 0.70 threshold, confirming the convergent validity of the AI capability construct (Table 3).

Finally, we continued to explore and integrate AI capability and strategic agility to develop a fourth-order construct of the 'coupling of AI capability and strategic agility', aiming to encapsulate the intricate link between AI capability and strategic agility. This approach allows researchers an opportunity to explore more abstract theoretical conceptualizations (Becker et al., 2023),

Table 2. Assessment of discriminant validity

Construct	COMO	CUSO	GIS	NPC	NSDP	OAM	SA
COMO							
CUSO	0.677						
GIS	0.737	0.558					
NPC	0.722	0.653	0.632				
NSDP	0.805	0.661	0.690	0.880			
OAM	0.696	0.730	0.553	0.706	0.653		
SA	0.774	0.619	0.609	0.672	0.755	0.659	

Note: COMO = competitor orientation; CUSO = customer orientation; GIS = government institutional support; NPC = new product creativity; NSDP = new service development performance; OAM = organizational ambidexterity; SA = strategic agility.

enabling a more comprehensive and nuanced representation of the synergistic effects between the two constructs. This provides a more accurate reflection of how the 'coupling of AI capability and strategic agility' contributes to organizational outcomes (i.e. new service development performance and new product creativity). The dimensions of AI capability (weight: 0.776) and strategic agility (weight: 0.299) both had satisfactory VIF values below 3.33 and both were statistically significant (p-value < 0.01) in forming the *coupling of AI capability and strategic agility*. Finally, a global item (i.e. 'Overall, the organization has integrated both AI capability and strategic agility into its business operations') was developed and assessed. The redundancy analysis result showed a path coefficient value of 0.718, higher than the 0.70 threshold (Hair et al., 2022), confirming the convergent validity of the coupling of AI capability and strategic agility construct (Table 3).

Structural model

When assessing the structural model, the outcome of our robustness checks was satisfactory (see Online Appendix F). Table 4 reveals that customer orientation (H1: $\beta = 0.298$, p-value < 0.01), competitor orientation (H2: $\beta = 0.333$, p-value < 0.01) and organizational ambidexterity (H3: $\beta = 0.321$, p-value < 0.01) exerted a significant influence on the coupling of AI capability and strategic agility. Therefore, H1, H2 and H3 are supported. Competitor orientation ($f^2 = 0.202$) and organizational ambidexterity ($f^2 = 0.165$) both exerted a medium effect on the coupling of AI capability and strategic agility, while customer orientation ($f^2 = 0.141$) had a small effect on this. Overall, these relationships explain 58.0% of the variance in coupling of AI capability and strategic agility.

Our next test showed that the coupling of AI capability and strategic agility exerted significant effects on new service development performance (H4a: $\beta = 0.687$, p-value < 0.01) and new product creativity (H4b: $\beta = 0.649$, p-value < 0.01). Overall, these relationships explain 47.2% of the variance in new service development performance and 42.2% of the variance in new product creativity, which are satisfactory results.

Next, the coupling of AI capability and strategic agility exerted a significant mediation effect between the three predictors (customer orientation, competitor orientation and organizational ambidexterity) on new service development performance (H5a: $\beta = 0.205$; H5b: $\beta = 0.229$; H5c: $\beta = 0.220$) and new product creativity (H6a: $\beta = 0.194$; H6b: $\beta = 0.216$; H6c: $\beta = 0.209$), with p-values lower than 0.01. Thus, H5a to H6c are supported. Overall, our results also demonstrate the predictive relevance of the model (see Online Appendix G).

Finally, government institutional support moderated the relationship between the coupling of AI capability and strategic agility and new service development performance (H7a: $\beta = 0.098$), as well as the coupling of AI capability and strategic agility and new product creativity (H7b: $\beta = 0.089$), with p-values lower than 0.01. This shows that H7a and H7b are supported by small effect sizes of 0.023 and 0.021, respectively (see Online Appendix H for a detailed explanation of the interaction plot).

Discussion

Theoretical and managerial implications

In this study, we examined how organizations' orientation and ambidexterity can improve their product and service creativity through the coupling of strategic agility and AI capability. Our findings show that coupling AI capability and strategic agility increases organizations' new product creativity and new service development performance. Our work combined two concepts that have traditionally been treated and analysed separately in the literature. Specifically, we found that combining the concepts of AI capability (Ameen et al., 2022; Mikalef, Conboy and Krogstie, 2022; Mikalef and Gupta, 2021) and strategic agility (Awan et al., 2022; Junni et al., 2015a; Tarba et al., 2023) has both direct and mediating effects in the context of new product creativity and new service development performance. Organizations that possess the required resources (tangible,

Table 3. Assessment of higher-order constructs

	Item/dimension	Weight	VIF	t-Value	p-Value
First-order construct					
Data	DATA1	0.249	1.230	5.345	0.000
	DATA2	0.272	1.164	4.946	0.000
	DATA3	0.246	1.121	5.007	0.000
	DATA4	0.269	1.153	5.304	0.000
	DATA5	0.212	1.231	4.155	0.000
	DATA6	0.286	1.197	5.483	0.000
Technology	Technology1	0.231	1.328	4.016	0.000
	Technology2	0.140	1.250	2.589	0.010
	Technology3	0.246	1.243	4.458	0.000
	Technology4	0.214	1.225	4.182	0.000
	Technology5	0.365	1.215	7.200	0.000
	Technology6	0.247	1.174	4.437	0.000
	Technology7	0.174	1.211	3.264	0.001
Basic resources	BR1	0.347	1.166	6.335	0.000
	BR2	0.365	1.163	6.542	0.000
	BR3	0.417	1.313	6.812	0.000
Technical skills	TS1	0.238	1.325	3.763	0.000
	TS2	0.327	1.239	5.481	0.000
	TS3	0.261	1.374	4.311	0.000
	TS4	0.115	1.362	1.939	0.043
	TS5	0.191	1.354	3.535	0.000
	TS6	0.208	1.211	3.988	0.000
	TS7	0.180	1.370	3.161	0.002
Business skills	BS1	0.178	1.423	3.833	0.000
	BS2	0.223	1.321	5.278	0.000
	BS3	0.221	1.295	5.096	0.000
	BS4	0.206	1.314	4.397	0.000
	BS5	0.243	1.292	6.251	0.000
	BS6	0.224	1.348	4.754	0.000
	BS7	0.242	1.222	5.559	0.000
Inter-departmental coordination	Inter-DC1	0.268	1.321	5.046	0.000
	Inter-DC2	0.169	1.281	2.986	0.003
	Inter-DC3	0.172	1.226	3.132	0.002
	Inter-DC4	0.225	1.218	4.067	0.000
	Inter-DC5	0.216	1.185	3.566	0.000
	Inter-DC6	0.253	1.200	3.801	0.000
	Inter-DC7	0.223	1.297	4.376	0.000
Organizational change capacity	OCC1	0.228	1.226	4.706	0.000
	OCC2	0.324	1.186	7.772	0.000
	OCC3	0.187	1.163	4.292	0.000
	OCC4	0.230	1.157	5.487	0.000
	OCC5	0.238	1.248	5.437	0.000
	OCC6	0.308	1.230	5.937	0.000
Risk proclivity	RP1	0.314	2.000	2.282	0.023
	RP2	0.355	1.641	3.160	0.002
	RP3	0.559	1.529	4.855	0.000
Second-order construct					
Tangible AI capabilities	Data	0.430	2.266	5.709	0.000
	Technology	0.392	2.407	5.392	0.000
	Basic resources	0.316	1.772	5.146	0.000
Human AI capabilities	Technical skills	0.299	2.266	4.349	0.000
	Business skills	0.756	2.266	12.668	0.000
Intangible AI capabilities	Inter-departmental coordination	0.392	1.578	6.320	0.000
	Organizational change capacity	0.621	1.689	10.752	0.000
	Risk proclivity	0.196	1.157	3.956	0.000
Third-order construct					
AI capability (CV: 0.891, FC: 1.589)	Tangible AI capabilities	0.218	3.314	2.638	0.008
	Human AI capabilities	0.341	3.050	4.364	0.000
	Intangible AI capabilities	0.516	2.855	9.200	0.000

Table 3. (Continued)

	Item/dimension	Weight	VIF	t-Value	p-Value
Fourth-order construct					
Coupling of AI capability and strategic agility (CV: 0.718, FC: 3.017)	AI capability	0.776	1.798	17.386	0.000
	Strategic agility	0.299	1.798	5.602	0.000

Note: CV = convergent validity; FC = full collinearity.
To summarize these results, we also demonstrated descriptive and correlation results (see Online Appendix E).

intangible and human) for AI, while maintaining flexibility and efficiency, are likely to gain better results from using AI for creativity, which, in turn, enables them to gain a competitive advantage. Such a combination allows for better augmentation, which is key to success when using AI for creativity (Ameen et al., 2022).

We also found that customer-oriented and competitor-oriented organizations alike can develop a combination of AI capability and strategic agility. In this regard, our findings show that when organizations align their strategies, objectives, products and services with their customers' voice (Kopalle et al., 2022), while responding to competition (Andreou, Harris and Philip 2020; Schulze et al., 2022), they are more likely to be more flexible and gather the required organizational resources for AI.

In addition, the results emphasize the significance of ambidexterity in enabling organizations to develop a successful coupling of their AI capability and strategic agility. Ambidexterity was found to affect various aspects of an organization's performance (Hu, Dou and You, 2023; Uhl-Bien and Arena, 2018). Our work extends this line of research by showing that when organizations leverage highly skilled people, explore new technologies, exploit marketing opportunities and constantly explore new opportunities, they can develop the resources required for the management of AI while remaining adaptable and efficient.

This research provides novel perspectives by identifying and empirically examining the mediating effects of coupling AI capability and strategic agility on each of the determinants (customer orientation, competitor orientation and ambidexterity) and creativity. While previous studies have explained that these determinants are linked to creativity (Ameen et al., 2022; Kurniawan et al., 2020), we found that when these organizations have a high level of strategic agility *and* the resources required for AI (tangible, intangible and human) are present, their product and service creativity increases. The coupling of AI capability and strategic agility acts as an enabler of creativity for customer-oriented, competitor-oriented and ambidextrous organizations.

Furthermore, our findings contribute to the recent literature on the impact of government support and policies on the organizational use of AI (e.g. Igna and Venturini, 2023; Lundvall and Rikap, 2022). They show that strong government institutional support has significance in a new context, as it is a key enabler for organizations that want to develop their AI capability and strategic agility to improve their creativity in new products and services.

Theoretical contributions

Our study makes several important contributions to management theories and literature, by drawing on the RBV as a theoretical background. While existing studies investigated the impact of organizational culture, climate and leadership on creativity (e.g. Amabile and Pratt, 2016; McKay, Mohan and Reina, 2022; Spoelma, Mai and Wei, 2022; Zhang et al., 2022), we proposed an integrative model that examines managers' perceptions of how organizations can successfully leverage AI by using the necessary resources and capabilities. Hence, our study makes three significant contributions to advancing the body of knowledge in these areas.

First, our findings suggest that managers find that coupling AI capability and strategic agility is critical to improving organizations' product and service creativity by playing both direct and mediating roles. AI has been acknowledged as a powerful tool that organizations can use to significantly increase their creativity and, in turn, their chances of survival in a competitive market (Ameen et al., 2022; Ameen, Sharma and Tarba, 2023; Pagani and Champion, 2023). Nevertheless, recent studies have highlighted that using AI successfully is still a challenge for organizations (Huang and Rust, 2021; Pagani and Champion, 2023). To the best of our knowledge, the present study is among the first to examine how the coupling of AI capability and strategic agility might improve organizations' new product creativity and service development performance. Our findings show that developing an organization's AI capability complements the effects of the organization's strategic agility on its creativity. This is an important finding, given the unique advantages AI offers for creativity.

Second, our study extends the management literature concerning the roles of customer orientation, competitor orientation, ambidexterity (as critical determinants that support the coupling of AI capability and strategic agility) and creativity. Researchers have examined

Table 4. Assessment of the structural model

Relationship	Std beta	Std error	t-Value	p-Value	BCa CI LB	BCa CI UB	VIF	f^2
Direct								
H1: Customer orientation → coupling of AI capability and strategic agility	0.298	0.038	7.928	0.000	0.237	0.360	1.497	0.141
H2: Competitor orientation → coupling of AI capability and strategic agility	0.333	0.038	8.695	0.000	0.267	0.393	1.312	0.202
H3: Organizational ambidexterity → coupling of AI capability and strategic agility	0.321	0.043	7.498	0.000	0.251	0.391	1.490	0.165
H4a: Coupling of AI capability and strategic agility → new service development performance	0.687	0.025	28.023	0.000	0.643	0.724	1.000	N/A
H4b: Coupling of AI capability and strategic agility → new product creativity	0.649	0.028	22.948	0.000	0.597	0.691	1.000	N/A
Mediation								
H5a: Customer orientation → coupling of AI capability and strategic agility → new service development performance	0.205	0.027	7.630	0.000	0.151	0.257		
H5b: Competitor orientation → coupling of AI capability and strategic agility → new service development performance	0.229	0.027	8.589	0.000	0.174	0.278		
H5c: Organizational ambidexterity → coupling of AI capability and strategic agility → new service development performance	0.220	0.032	6.858	0.000	0.160	0.285		
H6a: Customer orientation → coupling of AI capability and strategic agility → new product creativity	0.194	0.026	7.514	0.000	0.143	0.245		
H6b: Competitor orientation → coupling of AI capability and strategic agility → new product creativity	0.216	0.024	8.972	0.000	0.168	0.262		
H6c: Organizational ambidexterity → coupling of AI capability and strategic agility → new product creativity	0.209	0.032	6.486	0.000	0.148	0.275		
Moderation								
H7a: Coupling of AI capability and strategic agility × GIS → new service development performance	0.098	0.032	3.064	0.001	0.019	0.192		0.023
H7b: Coupling of AI capability and strategic agility × GIS → new product creativity	0.089	0.030	3.010	0.001	0.041	0.138		0.021
Control variables								
Firm size → new product creativity	0.062	0.053	1.167	0.123	−0.033	0.096		
Firm age → new product creativity	0.051	0.040	1.266	0.205	−0.013	0.085		
Industry type → new product creativity	0.025	0.060	0.407	0.389	0.068	−0.127		
Age → new product creativity	0.042	0.051	0.828	0.292	−0.033	0.137		
Gender → new product creativity	0.052	0.063	0.826	0.398	−0.067	0.141		
Job level → new product creativity	0.018	0.051	0.356	0.887	−0.060	0.097		
Firm size → new service development performance	0.027	0.054	0.506	0.787	−0.038	0.086		
Firm age → new service development performance	0.040	0.054	0.745	0.859	−0.004	0.152		
Industry type → new service development performance	0.011	0.118	0.094	0.925	−0.227	0.234		
Age → new service development performance	0.024	0.083	0.290	0.386	−0.113	0.160		
Gender → new service development performance	0.070	0.056	1.265	0.206	−0.030	0.188		
Job level → new service development performance	−0.011	0.060	0.184	0.854	−0.130	0.103		
Endogeneity test								

Table 4. (Continued)

Relationship	Std beta	Std error	t-Value	p-Value	BCa CI LB	BCa CI UB	VIF	f^2
GC (customer orientation) → coupling of AI capability and strategic agility	0.062	0.073	0.854	0.393	−0.077	0.208		
GC (competitor orientation) → coupling of AI capability and strategic agility	−0.004	0.103	0.038	0.970	−0.186	0.198		
GC (organizational ambidexterity) → coupling of AI capability and strategic agility	−0.092	0.070	1.301	0.193	−0.230	0.041		
GC (coupling of AI capability and strategic agility) → new service development performance	−0.117	0.170	0.688	0.202	−0.270	0.282		
GC (coupling of AI capability and strategic agility) → new product creativity	−0.108	0.135	0.800	0.076	−0.202	0.209		
Quality criteria: key target construct	R^2	Q^2_predict						
Coupling of AI capability and strategic agility	0.580	0.571						
New service development performance	0.472	0.370						
New product creativity	0.422	0.356						

Note: BCa CI = bias-corrected and accelerated confidence interval; GC = endogeneity test using Gaussian copula; N/A = not applicable.

the effects of customer and competitor orientation (e.g. Andreou, Harris and Philip, 2020; Kopalle et al., 2022; Park and Hur, 2023; Schulze et al., 2022; Sultana, Akter and Kyriazis, 2022; Zhang and Sharifi, 2000) and ambidexterity (e.g. Doblinger, Wales and Zimmermann, 2022; Hu, Dou and You, 2023; Uhl-Bien and Arena, 2018) on organizations' performance-related outcomes. However, our research investigated the effects of these determinants in a unique context: their use in developing AI to improve creativity. In addition, our findings show that coupling AI capability and strategic agility allows organizations to make better use of their customer and competitor orientations in addition to their explorative and exploitative activities to improve their product and service creativity.

Third, our findings advance the body of knowledge on the role of government institutional support in improving organizations' use of AI for creativity – specifically, the body of literature on government institutional support (e.g. Chen et al., 2014; Sheng, Zhou and Li, 2011; Shu et al., 2019; Wang, Jin and Zhou, 2023; Yi et al., 2021). It does so by showing that if organizations are to improve their creativity in developing new products and services, they need government support to be able to develop and utilize the required resources for AI (tangible, intangible and human) (Mikalef and Gupta, 2021) and to stay flexible without sacrificing efficiency (Junni et al., 2015a). This finding is unique because, even though previous studies have explored the effects of government institutional support in some contexts, such as firm innovation performance (Guan and Yam, 2015; Jugend et al., 2018; Shu et al., 2015), a gap remained in terms of understanding and conceptualizing the impact of government institutional support in the context of AI capability, strategic agility and creativity. Our study focused on the context in China, but we believe that our findings are generalizable given that the literature has acknowledged the effects of government support on organizations' performance in general in other countries (e.g. Kivimaa and Rogge, 2022; Selviaridis, Hughes and Spring, 2023). We add to this body of literature by exploring how government support can affect key aspects (i.e. AI capability and strategic agility) required to advance creativity.

Managerial implications

Our results have several managerial implications. First, managers should consider new and effective ways of developing and utilizing their resources and capabilities for new product creativity and new service development. Managers should consider augmentation (combining AI and human intelligence), which can significantly enhance product and service creativity. However, combining human and machine intelligence can be challenging. In this regard, our work offers managers, practitioners and decision-makers some solutions for developing and using the required resources to make effective use of augmentation for creativity.

Second, managers should focus on enhancing their strategic agility alongside their AI capability to gain value in changing market conditions without sacrificing efficiency. Specifically, to enhance their creativity and remain competitive in today's disruptive world, organizations need to focus on being strategically agile and developing and using AI capability. Hence, managers and

decision-makers should foster an internal environment that simultaneously supports AI capability and strategic agility, is suited to responding positively to changes in the external environment and still offers value through developing product and service creativity.

Third, managers should develop a strong awareness of the markets their organizations operate in, especially in relation to their customers and competitors. In addition, they should continue carrying out exploration and exploitation (i.e. ambidexterity) activities that lead to identifying highly skilled employees and the latest developments in AI, which can assist in developing new products and services. These activities are likely to provide organizations with better creative results when they are strategically agile and have the right AI capabilities in place.

Finally, governments and policymakers should support organizations to develop their AI capability, strategic agility and new product and service creativity by offering technology information, financial resources, beneficial policies and projects and tax reductions and subsidies. This support would encourage organizations to develop stronger capabilities and become more creative about their products and services.

Limitations and future research

Scholars should consider the results of this study in light of several limitations. By using a sample of managers drawn from China, we obtained insights into how AI capability and strategic agility can be used to improve new product creativity and new service development performance. In addition, we studied the impact of government institutional support in this context. Future studies could explore these dimensions by using data collected from employees in other countries and comparing the findings. In addition, researchers could explore human–AI collaboration further in the context of creativity and identify an appropriate balance between AI and human intelligence for achieving higher levels of creativity. Future research can also explore how organizations can develop a better understanding of knowledge transfer between humans and AI (and vice versa) for knowledge management, in addition to developing new theoretical and practical perspectives to capture knowledge transfer, learning and organisational performance when AI is employed.

Given the rapid development of AI systems, future research should explore the impact of generative AI and quantum computing in terms of transforming well-established business models and innovation in organizations. In addition, future studies can explore the impact of generative AI on value creation in organizations for the various stakeholders involved. For example, future research can explore how organizations can foster the development of critical thinking and analytical and evaluative skills among individuals to assess the value, resonance and impact of content created by generative AI. Finally, future research can explore how organizations handle competing interests and risk management to be more open about the judgements made by asset allocation of algorithms and generative AI.

References

Akter, S., S. F. Wamba, M. Mariani and U. Hani (2021). 'How to build an AI climate-driven service analytics capability for innovation and performance in industrial markets?', *Industrial Marketing Management*, **97**, pp. 258–273.

Albino-Pimentel, J., P. Dussauge and O. El Nayal (2022). 'Intellectual property rights, non-market considerations and foreign R&D investments', *Research Policy*, **51**, art. 104442.

Al-Surmi, A., G. Cao and Y. Duan (2020). 'The impact of aligning business, IT, and marketing strategies on firm performance', *Industrial Marketing Management*, **84**, pp. 39–49.

Amabile, T. M. and M. G. Pratt (2016). 'The dynamic componential model of creativity and innovation in organizations: making progress, making meaning', *Research in Organizational Behavior*, **36**, pp. 157–183.

Ameen, N., G. Sharma and S. Tarba (2023). 'Artificial intelligence and creativity in marketing: a proposed typology and new directions for academia–industry collaborations'. In M. Pagani and R. Champion (eds), *Artificial Intelligence for Business Creativity*, pp. 82–98. London: Routledge.

Ameen, N., G. D. Sharma, S. Tarba, A. Rao and R. Chopra (2022). 'Toward advancing theory on creativity in marketing and artificial intelligence', *Psychology and Marketing*, **39**, pp. 1802–1825.

Amit, R. and P. Schoemaker (1993). 'Strategic assets and organizational rent', *Strategic Management Journal*, **14**, pp. 33–46.

Andreou, P. C., T. Harris and D. Philip (2020). 'Measuring firms' market orientation using textual analysis of 10-K filings', *British Journal of Management*, **31**, pp. 872–895.

Awan, U., S. H. Bhatti, S. Shamim, Z. Khan, P. Akhtar and M. E. Balta (2022). 'The role of big data analytics in manufacturing agility and performance: moderation–mediation analysis of organizational creativity and of the involvement of customers as data analysts', *British Journal of Management*, **33**, pp. 1200–1220.

Barney, J. B. (2001). 'Resource-based theories of competitive advantage: a ten-year retrospective on the resource-based view', *Journal of Management*, **27**, pp. 643–650.

Barney, J. B., M. Wright and D. J. Ketchen (2001). 'The resource-based view of the firm: ten years after 1991', *Journal of Management*, **27**, pp. 625–641.

Becker, J. M., J. H. Cheah, R. Gholamzade, C. M. Ringle and M. Sarstedt (2023). 'PLS-SEM's most wanted guidance', *International Journal of Contemporary Hospitality Management*, **35**, pp. 321–346.

Beraja, M., D. Y. Yang and N. Yuchtman (2021). 'Data-intensive innovation', *Angewandte Chemie International Edition*, **6**, pp. 951–952.

Bonaretti, D., M. Bartosiak, T. W. Lui, G. Piccoli and D. Marchesani (2020). '"What can I(S) do for you?": how technology enables service providers to elicit customers' preferences and deliver personalized service', *Information & Management*, **57**, art. 103346.

Bouguerra, A., I. Gölgeci, D. M. Gligor and E. Tatoglu (2021). 'How do agile organizations contribute to environmental collaboration? Evidence from MNEs in Turkey', *Journal of International Management*, **27**, art. 100711.

Bowman, C. and V. Ambrosini (2003). 'How the resource-based and the dynamic capability views of the firm inform corporate-level strategy', *British Journal of Management*, **14**, pp. 289–303.

Branscum, L. (2022). 'How generative AI is transforming marketing—for better or worse'. www.typeform.com/blog/inspiration/how-generative-ai-is-transforming-marketing/.

Brislin, R. W. (1980). 'Translation and content analysis of oral and written material'. In H. C. Triandis and J. W. Berry (eds), *Handbook of Cross-cultural Psychology: Methodology*, pp. 389–444. Boston: Allyn & Bacon.

Chalmers, D., N. G. MacKenzie and S. Carter (2021). 'Artificial intelligence and entrepreneurship: implications for venture creation in the fourth industrial revolution', *Entrepreneurship Theory and Practice*, **45**, pp. 1028–1053.

Chen, Y., Y. Wang, S. Nevo, J. Jin, L. Wang and W. S. Chow (2014). 'IT capability and organizational performance: the roles of business process agility and environmental factors', *European Journal of Information Systems*, **23**, pp. 326–342.

Chowdhury, S., P. Dey, S. Joel-Edgar, S. Bhattacharya, O. Rodriguez-Espindola, A. Abadie, et al. (2023). 'Unlocking the value of artificial intelligence in human resource management through AI capability framework', *Human Resource Management Review*, **33**, art. 100899.

Columbus, L. (2020, July 9). '10 ways AI is improving new product development'. *Forbes*. www.forbes.com/sites/louiscolumbus/2020/07/09/10-ways-ai-is-improving-new-product-development/.

Cyranoski, D. (2018). 'China enters the battle for AI talent'. *Nature*, **553**, pp. 260–261.

Das, K., J. D. Patel, A. Sharma and Y. Shukla (2023). 'Creativity in marketing: examining the intellectual structure using scientometric analysis and topic modeling', *Journal of Business Research*, **154**, art. 113384.

Dean, T., D. A. Griffith and R. J. Calantone (2016). 'New product creativity: understanding contract specificity in new product introductions', *Journal of Marketing*, **80**, pp. 39–58.

Del Giudice, M., V. Scuotto, A. Papa, S. Y. Tarba, S. Bresciani and M. Warkentin (2021). 'A self-tuning model for smart manufacturing SMEs: effects on digital innovation', *Journal of Product Innovation Management*, **38**, pp. 68–89.

Doblinger, C., W. Wales and A. Zimmermann (2022). 'Stemming the downturn: how ambidexterity and public policy influence firm performance stability during economic crises', *European Management Journal*, **40**, pp. 163–174.

Dubiel, A. and P. Mukherji (2022). 'Same, same but different! New service development in the context of emerging markets: a review', *International Marketing Review*, **39**, pp. 1226–1251.

Dwivedi, Y. K., L. Hughes, E. Ismagilova, G. Aarts, C. Coombs, T. Crick, et al. (2021). 'Artificial intelligence (AI): multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy', *International Journal of Information Management*, **57**, art. 101994.

Franco, C. and F. Landini (2022). 'Organizational drivers of innovation: the role of workforce agility', *Research Policy*, **51**, art. 104423.

Frare, A. B. and I. M. Beuren (2021). 'Fostering individual creativity in startups: comprehensive performance measurement systems, role clarity and strategic flexibility', *European Business Review*, **33**, pp. 869–891.

Garbuio, M. and N. Lin (2021). 'Innovative idea generation in problem finding: abductive reasoning, cognitive impediments, and the promise of artificial intelligence', *Journal of Product Innovation Management*, **38**, pp. 701–725.

Gartner (2022). 'Gartner survey reveals 80% of executives think automation can be applied to any business decision'. www.gartner.com/en/newsroom/press-releases/2022-08-22-gartner-survey-reveals-80-percent-of-executives-think-automation-can-be-applied-to-any-business-decision.

Gu, Q., P. S. Hempel and M. Yu (2020). 'Tough love and creativity: how authoritarian leadership tempered by benevolence or morality influences employee creativity', *British Journal of Management*, **31**, pp. 305–324.

Guan, J. and R. C. M. Yam (2015). 'Effects of government financial incentives on firms' innovation performance in China: evidences from Beijing in the 1990s', *Research Policy*, **44**, pp. 273–282.

Hair, J. F., G. T. Hult, C. M. Ringle and M. Sarstedt (2022). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 3rd edn. Thousand Oaks, CA: SAGE.

Hajli, N., M. Tajvidi, A. Gbadamosi and W. Nadeem (2020). 'Understanding market agility for new product success with big data analytics', *Industrial Marketing Management*, **86**, pp. 135–143.

He, W., P. Hao, X. Huang, L. R. Long, N. J. Hiller and S. L. Li (2020). 'Different roles of shared and vertical leadership in promoting team creativity: cultivating and synthesizing team members' individual creativity', *Personnel Psychology*, **73**, pp. 199–225.

Homburg, C. and D. M. Wielgos (2022). 'The value relevance of digital marketing capabilities to firm performance', *Journal of the Academy of Marketing Science*, **50**, pp. 666–688.

Hoonsopon, D. and W. Puriwat (2021). 'Organizational agility: key to the success of new product development', *IEEE Transactions on Engineering Management*, **68**, pp. 1722–1733.

Hu, M., J. Dou and X. You (2023). 'Is organizational ambidexterity always beneficial to family-managed SMEs? Evidence from China', *Journal of Business Research*, **167**, art. 114184.

Huang, M.-H. and R. T. Rust (2018). 'Artificial intelligence in service', *Journal of Service Research*, **21**, pp. 155–172.

Huang, M.-H. and R. T. Rust (2021). 'A strategic framework for artificial intelligence in marketing', *Journal of the Academy of Marketing Science*, **49**, pp. 30–50.

Huang, M.-H. and R. T. Rust (2022). 'A framework for collaborative artificial intelligence in marketing', *Journal of Retailing*, **98**, pp. 209–223.

Hughes, M., M. Filser, R. Harms, S. Kraus, M. L. Chang and C. F. Cheng (2018). 'Family firm configurations for high performance: the role of entrepreneurship and ambidexterity', *British Journal of Management*, **29**, pp. 595–612.

Igalla, M., J. Edelenbos and I. van Meerkerk (2020). 'What explains the performance of community-based initiatives? Testing the impact of leadership, social capital, organizational capacity, and government support', *Public Management Review*, **22**, pp. 602–632.

Igna, I. and F. Venturini (2023). 'The determinants of AI innovation across European firms', *Research Policy*, **52**, art. 104661.

Im, S., M. Hussain and S. Sengupta (2008). 'Testing interaction effects of the dimensions of market orientation on marketing program creativity', *Journal of Business Research*, **61**, pp. 859–867.

Im, S., M. M. Montoya and J. P. Workman (2013). 'Antecedents and consequences of creativity in product innovation teams', *Journal of Product Innovation Management*, **30**, pp. 170–185.

Jugend, D., C. J. C. Jabbour, J. A. Alves Scaliza, R. S. Rocha, J. A. G. Junior, H. Latan, et al. (2018). 'Relationships among open innovation, innovative performance, government support and firm size: comparing Brazilian firms embracing different levels of radicalism in innovation', *Technovation*, **75**, pp. 54–65.

Junni, P., R. M. Sarala, S. Y. Tarba and Y. Weber (2015a). 'The role of strategic agility in acquisitions', *British Journal of Management*, **26**, pp. 596–616.

Junni, P., R. M. Sarala, S. Y. Tarba, Y. Liu and C. L. Cooper (2015b). 'Guest editors' introduction: the role of human resources and organizational factors in ambidexterity', *Human Resource Management*, **54**, pp. 1–28.

Katou, A. A., P. S. Budhwar and C. Patel (2021). 'A trilogy of organizational ambidexterity: leader's social intelligence, employee work engagement and environmental changes', *Journal of Business Research*, **128**, pp. 688–700.

Khan, H. (2020). 'Is marketing agility important for emerging market firms in advanced markets?', *International Business Review*, **29**, art. 101733.

Kim, M., J. Song and J. Triche (2015). 'Toward an integrated framework for innovation in service: a resource-based view and dynamic capabilities approach', *Information Systems Frontiers*, **17**, pp. 533–546.

Kitchens, B., D. Dobolyi, J. Li and A. Abbasi (2018). 'Advanced customer analytics: strategic value through integration of relationship-oriented big data', *Journal of Management Information Systems*, **35**, pp. 540–574.

Kivimaa, P. and K. S. Rogge (2022). 'Interplay of policy experimentation and institutional change in sustainability transitions: the case of mobility as a service in Finland', *Research Policy*, **51**, art. 104412.

Kopalle, P. K., M. Gangwar, A. Kaplan, D. Ramachandran, W. Reinartz and A. Rindfleisch (2022). 'Examining artificial intelligence (AI) technologies in marketing via a global lens: current trends and future research opportunities', *International Journal of Research in Marketing*, **39**, pp. 522–540.

Kozinets, R. V. and U. Gretzel (2021). 'Commentary: artificial intelligence: the marketer's dilemma', *Journal of Marketing*, **85**, pp. 156–159.

Krakowski, S., J. Luger and S. Raisch (2023). 'Artificial intelligence and the changing sources of competitive advantage', *Strategic Management Journal*, **44**, pp. 1425–1452.

Kühl, N., M. Mühlthaler and M. Goutier (2020). 'Supporting customer-oriented marketing with artificial intelligence: automatically quantifying customer needs from social media', *Electronic Markets*, **30**, pp. 351–367.

Kurniawan, R., D. Budiastuti, M. Hamsal and W. Kosasih (2020). 'The impact of balanced agile project management on firm performance: the mediating role of market orientation and strategic agility', *Review of International Business and Strategy*, **30**, pp. 457–490.

Liu, H., S. B. Dust, M. Xu and Y. Ji (2021). 'Leader–follower risk orientation incongruence, intellectual stimulation, and creativity: a configurational approach', *Personnel Psychology*, **74**, pp. 143–173.

Lundvall, B.-Å. and C. Rikap (2022). 'China's catching-up in artificial intelligence seen as a co-evolution of corporate and national innovation systems', *Research Policy*, **51**, art. 104395.

Magistretti, S., C. T. A. Pham and C. Dell'Era (2021). 'Enlightening the dynamic capabilities of design thinking in fostering digital transformation', *Industrial Marketing Management*, **97**, pp. 59–70.

McKay, A. S., M. Mohan and C. S. Reina (2022). 'Another day, another chance: daily workplace experiences and their impact on creativity', *Journal of Product Innovation Management*, **39**, pp. 292–311.

McKinsey. (2021). 'The growth triple play: creativity, analytics, and purpose'. www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/the-growth-triple-play-creativity-analytics-and-purpose.

Medeiros, M. M. D. and A. C. G. Maçada (2021). 'Competitive advantage of data-driven analytical capabilities: the role of big data visualization and of organizational agility'. *Management Decision*, **60**, pp. 953–975.

Mikalef, P., K. Conboy and J. Krogstie (2022). 'Artificial intelligence as an enabler of B2B marketing: a dynamic capabilities microfoundations approach', *Industrial Marketing Management*, **98**, pp. 80–92.

Mikalef, P. and M. Gupta (2021). 'Artificial intelligence capability: conceptualization, measurement calibration, and empirical study on its impact on organizational creativity and firm performance', *Information & Management*, **58**, art. 103434.

Millar, C. C. J. M., O. Groth and J. F. Mahon (2018). 'Management innovation in a VUCA world: challenges and recommendations', *California Management Review*, **61**, pp. 5–14.

Moore, Z., D. E. Harrison and J. Hair (2021). 'Data quality assurance begins before data collection and never ends: what marketing researchers absolutely need to remember', *International Journal of Market Research*, **63**, pp. 693–714.

Ng, F. and K. Au (2022). 'Entrepreneurship and innovation in a metropolis: education and policy implications in Hong Kong', *Journal of Product Innovation Management*, **39**, pp. 489–491.

Oliver, C. (1997). 'Sustainable competitive advantage: combining institutional and resource-based views', *Strategic Management Journal*, **18**, pp. 697–713.

O'Reilly, C. A. and M. L. Tushman (2004). 'The ambidextrous organization', *Harvard Business Review*, **82**, pp. 74–83.

O'Reilly, C. A. and M. L. Tushman (2008). 'Ambidexterity as a dynamic capability: resolving the innovator's dilemma', *Research in Organizational Behavior*, **28**, pp. 185–206.

O'Reilly, C. A. and M. L. Tushman (2011). 'Organizational ambidexterity in action: how managers explore and exploit', *California Management Review*, **53**, pp. 5–22.

Pagani, M. and R. Champion (2023). *Artificial Intelligence for Business Creativity*. London: Routledge.

Park, H. and W. M. Hur (2023). 'Customer showrooming behavior, customer orientation, and emotional labor: sales control as a moderator', *Journal of Retailing and Consumer Services*, **72**, art. 103268.

Park, S. D. (2022). 'Policy discourse among the Chinese public on initiatives for cultural and creative industries: text mining analysis', *SAGE Open*, **12**, art. 215824402210799.

Peerally, J. A., F. Santiago, C. De Fuentes and S. Moghavvemi (2022). 'Towards a firm-level technological capability framework to endorse and actualize the Fourth Industrial Revolution in developing countries', *Research Policy*, **51**, art. 104563.

Puriwat, W. and D. Hoonsopon (2022). 'Cultivating product innovation performance through creativity: the impact of organizational agility and flexibility under technological turbulence', *Journal of Manufacturing Technology Management*, **33**, pp. 741–762.

Roberts, H., J. Cowls, J. Morley, M. Taddeo, V. Wang and L. Floridi (2021). 'The Chinese approach to artificial intelligence: an analysis of policy, ethics, and regulation'. In L. Floridi (ed.), *Ethics, Governance, and Policies in Artificial Intelligence*, pp. 47–79. Cham: Springer International.

Sarstedt, M., C. M. Ringle, J. H. Cheah, H. Ting, O. I. Moisescu and L. Radomir (2020). 'Structural model robustness checks in PLS-SEM', *Tourism Economics*, **26**, pp. 531–554.

Schulze, A., J. D. Townsend and M. B. Talay (2022). 'Completing the market orientation matrix: the impact of proactive competitor orientation on innovation and firm performance', *Industrial Marketing Management*, **103**, pp. 198–214.

Schwandt, F. (2019). 'Digital economy compass', *Statistista*, 230. https://cdn.statcdn.com/download/pdf/DigitalEconomyCompass2019.pdf.

Selviaridis, K., A. Hughes and M. Spring (2023). 'Facilitating public procurement of innovation in the UK defence and health sectors: innovation intermediaries as institutional entrepreneurs', *Research Policy*, **52**, art. 104673.

Shamim, S., Y. Yang, N. U. Zia, Z. Khan and S. M. Shariq (2023). 'Mechanisms of cognitive trust development in artificial intelligence among front line employees: an empirical examination from a developing economy', *Journal of Business Research*, **167**, art. 114168.

Shams, R., D. Vrontis, Z. Belyaeva, A. Ferraris and M. R. Czinkota (2021). 'Strategic agility in international business: a conceptual framework for "agile" multinationals', *Journal of International Management*, **27**, art. 100737.

Sheng, S., K. Z. Zhou and J. J. Li (2011). 'The effects of business and political ties on firm performance: evidence from China', *Journal of Marketing*, **75**, pp. 1–15.

Shirazi, F., H. T. Tseng, O. Adegbite, N. Hajli and S. Rouhani (2022). 'New product success through big data analytics: an empirical evidence from Iran', *Information Technology and People*, **35**, pp. 1513–1539.

Shu, C., D. De Clercq, Y. Zhou and C. Liu (2019). 'Government institutional support, entrepreneurial orientation, strategic renewal, and firm performance in transitional China', *International Journal of Entrepreneurial Behaviour and Research*, **25**, pp. 433–456.

Shu, C., Q. Wang, S. Gao and C. Liu (2015). 'Firm patenting, innovations, and government institutional support as a double-edged sword', *Journal of Product Innovation Management*, **32**, pp. 290–305.

Škare, M. and D. R. Soriano (2021). 'A dynamic panel study on digitalization and firm's agility: what drives agility in advanced economies 2009–2018', *Technological Forecasting and Social Change*, **163**, art. 120418.

Spoelma, T. M., K. M. Mai and W. Wei (2022). 'Understanding the effects of cheating configurations on team creative performance: a social impact theory perspective', *Personnel Psychology*, https://doi.org/10.1111/peps.12563.

Sultana, S., S. Akter and E. Kyriazis (2022). 'How data-driven innovation capability is shaping the future of market agility and competitive performance?', *Technological Forecasting and Social Change*, **174**, art. 121260.

Tarba, S. Y., J. G. Frynas, Y. Liu, G. Wood, R. M. Sarala and S. Fainshmidt (2023). 'Strategic agility in international business', *Journal of World Business*, **58**, art. 101411.

Tarba, S. Y., J. J. P. Jansen, T. J. M. Mom, S. Raisch and T. C. Lawton (2020). 'A microfoundational perspective of organizational ambidexterity: critical review and research directions', *Long Range Planning*, **53**, art. 102048.

Teece, D. J. (2007). 'Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance', *Strategic Management Journal*, **28**, pp. 1319–1350.

Teece, D. J., M. Peteraf and S. Leih (2016). 'Dynamic capabilities and organizational agility: risk, uncertainty, and strategy in the innovation economy', *California Management Review*, **58**, pp. 13–35.

Teece, D. J. (2018). 'Business models and dynamic capabilities', *Long Range Planning*, **51**, pp. 40–49.

Teece, D. J., G. Pisano and A. Shuen (1997). 'Dynamic capabilities and strategic management', *Strategic Management Journal*, **18**, pp. 509–533.

The Economist. (2017, July 15). 'China may match or beat America in AI'. https://tinyurl.com/3ftxj9uv.

Tønnessen, Ø., A. Dhir and B.-T. Flåten (2021). 'Digital knowledge sharing and creative performance: work from home during the COVID-19 pandemic', *Technological Forecasting and Social Change*, **170**, art. 120866.

Tushman, M. L. and C. A. O'Reilly (1996). 'Ambidextrous organizations: managing evolutionary and revolutionary change', *California Management Review*, **38**, pp. 8–29.

Uhl-Bien, M. and M. Arena (2018). 'Leadership for organizational adaptability: a theoretical synthesis and integrative framework', *Leadership Quarterly*, **29**, pp. 89–104.

Vahlne, J.-E. and A. Jonsson (2017). 'Ambidexterity as a dynamic capability in the globalization of the multinational business enterprise (MBE): case studies of AB Volvo and IKEA', *International Business Review*, **26**, pp. 57–70.

Wang, L., J. L. Jin and K. Z. Zhou (2023). 'Technological capability strength/asymmetry and supply chain process innovation: the contingent roles of institutional environments', *Research Policy*, **52**, art. 104724.

Warner, K. S. and M. Wäger (2019). 'Building dynamic capabilities for digital transformation: an ongoing process of strategic renewal', *Long Range Planning*, **52**, pp. 326–349.

Weber, Y. and S. Y. Tarba (2014). 'Strategic agility: a state of the art introduction to the special section on strategic agility', *California Management Review*, **56**, pp. 5–12.

Wu, F., C. Lu, M. Zhu, H. Chen, J. Zhu, K. Yu, et al. (2020). 'Towards a new generation of artificial intelligence in China', *Nature Machine Intelligence*, **2**, pp. 312–316.

Xia, S., J. Song, N. Ameen, D. Vrontis, J. Yan and F. Chen (2023). 'What changes and opportunities does big data analytics capability bring to strategic alliance research? A systematic literature review', *International Journal of Management Reviews*, **26**, pp. 34–53.

Yang, Y. and A. M. Konrad (2011). 'Understanding diversity management practices: implications of institutional theory and resource-based theory', *Group & Organization Management*, **36**, pp. 6–38.

Yang, Y., P. K. C. Lee and T. C. E. Cheng (2016). 'Continuous improvement competence, employee creativity, and new service development performance: a frontline employee perspective', *International Journal of Production Economics*, **171**, pp. 275–288.

Yi, J., M. Murphree, S. Meng and S. Li (2021). 'The more the merrier? Chinese government R&D subsidies, dependence, and firm innovation performance', *Journal of Product Innovation Management*, **38**, pp. 289–310.

Zahoor, N., H. Khan, F. Donbesuur, Z. Khan and T. Rajwani (2023). 'Grand challenges and emerging market small and medium enterprises: the role of strategic agility and gender diversity', *Journal of Product Innovation Management*, https://doi.org/10.1111/jpim.12661.

Zhang, Y., Y. Zhang, K. S. Law and J. Zhou (2022). 'Paradoxical leadership, subjective ambivalence, and employee creativity: effects of employee holistic thinking', *Journal of Management Studies*, **59**, pp. 695–723.

Zhang, Z. D. and H. Sharifi (2000). 'A methodology for achieving agility in manufacturing organizations', *International Journal of Operations and Production Management*, **62**, pp. 7–22.

Zhang, Z. D. and H. Sharifi (2007). 'Towards theory building in agile manufacturing strategy – a taxonomical approach', *IEEE Transactions on Engineering Management*, **54**, pp. 351–370.

Nisreen Ameen is a Senior Lecturer (Associate Professor) in Digital Marketing at Royal Holloway, University of London and Director of the Digital Organisation and Society Research Centre. Nisreen is also currently serving as Vice President of the UK Academy of Information Systems (UKAIS). Nisreen's research focuses on two main themes: first, consumer interactions with cutting-edge technologies; and second, how organizations can use these technologies to provide better experiences, services and products.

Shlomo Y. Tarba is Chair (Full Professor) of Strategy & International Business, University of Birmingham, and is a Fellow of Academy of Social Sciences (FAcSS). He serves as an Associate Editor of Journal of Product Innovation Management. His research interests include M&A, agility, ambidexterity, resilience, and AI. His papers have been published in the *Journal of Management*, *Journal of Product Innovation Management*, *Journal of Organizational Behavior, Academy of Management Perspectives and Journal of Service Research*.

Jun-Hwa Cheah (Jacky) is an Associate Professor at Norwich Business School, the University of East Anglia. His areas of interest include consumer behaviour, quantitative research and methodological issues. His publications have appeared in the *Journal of Business Research*, *European Journal of Marketing*, *Psychology and Marketing*,

Technological Forecasting and Social Change, *Internet Research*, *Tourism Management*, *International Journal of Contemporary Hospitality Management*, *International Journal of Hospitality Management*, and so on. He has received several research awards, for example the Emerald Young Researcher Award 2021.

Senmao Xia is a Senior Lecturer (Associate Professor) at the University of Surrey. He serves as Vice President for the Chinese Economic Association (Europe) and acts as Managing Editor/Associate Editor/EBM for multiple journals, including the *Journal of Chinese Economic and Business Studies*, *EuroMed Journal of Business* and *Journal of Innovation and Knowledge*. Senmao coauthored the UK Parliament APPG white paper as well as other multiple impactful research reports. He is a Senior Fellow of Higher Education Academy (SFHEA) and acts as an advisor for multiple high-tech firms in London.

Gagan Deep Sharma currently works as a Professor of Management at Guru Gobind Singh Indraprastha University, New Delhi. He is Associate Director, Office of International Affairs at the university. He holds a PhD in Management and a Master's in Philosophy and Commerce. He has more than 20 years of academic experience. He has published in, reviewed for and edited/guest-edited a number of high-impact journals.

Supporting Information

Additional supporting information can be found online in the Supporting Information section at the end of the article.