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Resistance to innovation: A dynamic capability model based enquiry into retailers' resistance to blockchain adaptation

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ABSTRACT

Blockchain research is significantly growing, yet the practical implementation of blockchain among retailers is still in the novice stage. This research aims to study the underlying factors that build resistance toward blockchain among retailers. The study has used innovation resistance theory (IRT) and the dynamic capability model to build the conceptual model. The study used a single cross-sectional design to investigate the proposed model with data collected from 360 retailers. The data were analysed using structural equation modelling estimated with the maximum likelihood model. The study's results showed that the threat of data ownership is the most significant factor that builds resistance towards blockchain, followed by threat severity. The results also showed that managerial capability and innovation capability could indirectly influence the relationship of IRT variables to resistance towards blockchain. The research extends the knowledge in the blockchain and contributes to relevant literature and business practitioners concerned with the results.

1. Introduction

The scope of blockchain technology in modernising complex supply chain systems is unprecedented. Adaptation and implementation of concrete blockchain infrastructures across key operations add value for partners and stakeholders. In recent years, giant retail companies like Amazon, Walmart, IKEA, Nestle, and Alibaba have collaborated with IBM and Microsoft in exploring opportunities to integrate sophisticated blockchain technology into their ecosystem (Mitzner, 2022). A blockchain is essentially a distributed database of records or a public ledger of executed transactions; in other words, blockchains are digital events shared among participating partners in a secured tokenised form (Angelis & Da Silva, 2019). Sophisticated blockchain systems use fragmented blocks of digital information, also known as "nodes", to record, coordinate, and exchange transaction data within respective electronic ledgers instead of maintaining records within centralised conventional ledger formats. Due to cryptocurrency's recent popularity, distributed ledger technology has become a key trope of the FinTech revolution (Ali et al. 2020).

Blockchain technology has many applications outside the financial sector (Hofstetter et al., 2022; Colicev, 2022). Blockchain application in the supply chain is extensive, from raw material supply to coordination with marketing channel partners (Cole et al., 2019; Tan & Saraniemi, 2022). While every supply chain partner can play a crucial role in functionalising blockchain, the retailer's role remains vital (Sternberg et al., 2021). Current research has developed strong foundations for blockchain applications in supply chain performance (Saberi et al., 2019). While the knowledge and growth of blockchain are recorded in research platforms (Gligor et al., 2021, Kshetri, 2021), its operationality and adoption are yet to be explored, especially in developing economies (Kshetri, 2021). Most of the research investigating the adoption of blockchain in the supply chain has ignored the retailer's role in the network. Considerable knowledge is available to understand the blockchain adoption intention (Kamble et al., 2021; Dehghani et al., 2022), yet on the other hand, practical notes report less adoption with retailers (Southey, 2019). This data only suggests researchers investigate

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what stops retailers from adopting blockchain in their network. Retailers may have functional and psychological difficulties that can resist adopting blockchain in their organisations.

Blockchain technology has a well-organised application scenario for promoting information openness and technology-level benefits to retailers, but we also need to consider the associated issues alongside the benefits. Multi-facet issues are associated with blockchain implementation and usage at functional and psychological levels. The data access provided to blockchain owners is one of the significant threats to the supply chain (Zhang & Chen, 2019). As crucial supply chain members, retailers are responsible for safeguarding their data and customers. Although data security is prominent in the blockchain network, ownership access constantly threatens the stakeholders involved in the blockchain ecosystem (Tan & Salo, 2021). To our knowledge, no studies have highlighted the issue of data ownership risk in data handling in a blockchain-like network. Data security in a blockchain network threatens the retailer at functional and psychological levels. At the operational level, losing data in the blockchain network can threaten retailers to adopt; at the psychological level, retailers can be susceptible to data security. At the psychological level, retailers may be satisfied with their existing system of operations, which can act as a resistance factor for them to adopt a blockchain-based ecosystem. Though the inertia and the security threats may resist retailers in blockchain adoption, how does it go with competent managers? Seminal research has supported that dynamic capability is tuned to risk-taking behaviour and open to transitions (Lawson & Samson, 2001). Huang et al. (2021) highlighted that managerial capability is the key to overcoming resistance behaviour. Can the same apply here where it diminishes the effect of psychological and functional barriers on the adoption of blockchain systems?

In light of the above discussion, this study adapts the innovation resistance theory framework to investigate the following gaps; (1) how do the functional barriers (data security and switching costs) and psychological barriers (inertia) describe the retailers' resistance toward adopting blockchain, (2) Can managerial and innovation capability intervene and reduce the effect in the relationship of barriers to resistance, (3) How does blockchain awareness interact in the proposed relationships. Based on the gaps, the following research questions are proposed:

RQ1: What is the role of functional and psychological barriers in resistance to adopting blockchain technology among retailers?
RQ2: Can managerial and innovation capability impact the relationship of barriers to resistance towards the adoption of blockchain technology among retailers?

Previous studies using innovation resistance theory have accommodated usage, values, and risk as functional barriers, tradition and image as psychological barriers. The present study has introduced inertia as a psychological barrier, switching cost, threat of data ownership, threat severity, and threat susceptibility as functional barriers by adopting the innovation resistance theory (IRT; Ram & Sheth, 1989). Thus, the study extends the available knowledge concerning the theory. The studies investigating the underlying factors for resistance towards technology have never used the strength of business capability as an intervening variable to understand whether it can lessen the effect of the resistance. This study has employed managerial capability and innovation capability as mediating variables; the study's results can upgrade the available understanding of dynamic capability models and their usage in resistance theories.

The manuscript is organised in the following pattern; first, the theory and background literature are discussed, after which the conceptual model's hypotheses are proposed. Secondly, the proposed methodology and analyses are provided. Thirdly, the study results are provided, and the results are discussed next to that. Finally, the theoretical and practical implications are given with concluding remarks.

2. Literature and theoretical background

2.1. Blockchain in retailing

Blockchain has been considered the most reliable technology in recent years, benefiting the stakeholders in the supply chain (Queiroz et al., 2019). Besides reliability, blockchain can also benefit retailers by incorporating sustainable and tracking functions and building a comprehensive retailing ecosystem (Garaus & Treiblmaier, 2021). While blockchain is gradually penetrating the retailer segment, many retail giants have started implementing blockchain in their processes. Implementation of blockchain in primarily dependent upon the knowledge and investments involved in creating the technology architecture (Zhang et al., 2020). Blockchain investments in retail industries are expected to reach $25.8 billion globally by 2029, with a growing CAGR of 68.3 % from 2022 to 2029 (MRICT, 2022). The retail sector has become more dynamic and receptive to engaging various technologies and addressing customer expectations. Blockchain has become a central point for retailers during their progression to innovate any ideas in their processes. For example, Non Fungible Tokens (NFTs) have become integral when retailers think of testing metaverse-based retailer format (Dwivedi et al., 2022a; Dwivedi et al., 2022b). Thus more than a standalone system, blockchain has become a complimenting technology to assist retailers in better benefits.

Most studies that have addressed blockchain functions have holistically derived it from the supply chain format rather than limiting it to retailers (Cole et al., 2019; Kamble et al., 2021). However, research in blockchain-related to various retailing operations is gradually increasing. Garaus and Treiblmaier (2021) highlighted how blockchain-based traceability systems could benefit both retailers and consumers regarding food safety. From a strategic pricing feature, Zhang et al. (2022) found that blockchain may not always be lucrative for retailers, given the competitive structure in the blockchain environment. Treiblmaier and Sillaber (2021) suggested that blockchain can operate without dedicated intermediaries in e-commerce based on a developed framework. Saxena and Sarkar (2023) have supported that blockchain can provide the best replenishment strategies for retailers. The growing literature on the blockchain has asserted that retailing can improve traceability, combat counterfeiting, enforce food safety, faster and secure payment processing, and integrate loyalty programs. Companies are trying to fit into blockchain in the best possible way to leverage the maximum benefit from the technology (Hughes et al., 2019). However, the adoption level of blockchain among supply chain partners, especially with retailers, is still in the introductory stage, and multiple challenges resist blockchain adoption (Queiroz & Wamba, 2019). This research applies IRT and capability theories to investigate the underlying factors causing resistance towards blockchain.

2.2. Innovation resistance theory

Innovation can be regarded as a high degree of change in users' day-to-day activities. Despite the benefits that innovations can provide to an individual or a business, the resistance towards adopting innovation or technology is still higher, and it can play a significant role in shaping the success or failure of the innovation or technology (Ram & Sheth, 1989). Innovation resistance theory (IRT) describes customer resistance in terms of active and passive behaviour (Ram & Sheth,1989; Heidenreich & Handrich, 2015). Active resistance is a form of resistance that develops from the qualities of innovations, IRT's functional barriers can be applied to study active resistance (Yu & Chantatub, 2015). These resistances represent the barriers to innovation acceptance and usage arising from the behavioural inconsistencies that are brought on by functional derivations (Yu & Chantatub, 2015). Conflicts with conventional views result in passive resistance, which can be explored using the IRT-proposed psychological barriers (Yu & Chantatub, 2015). Previous studies have used IRT in the context of resistance toward; mobile

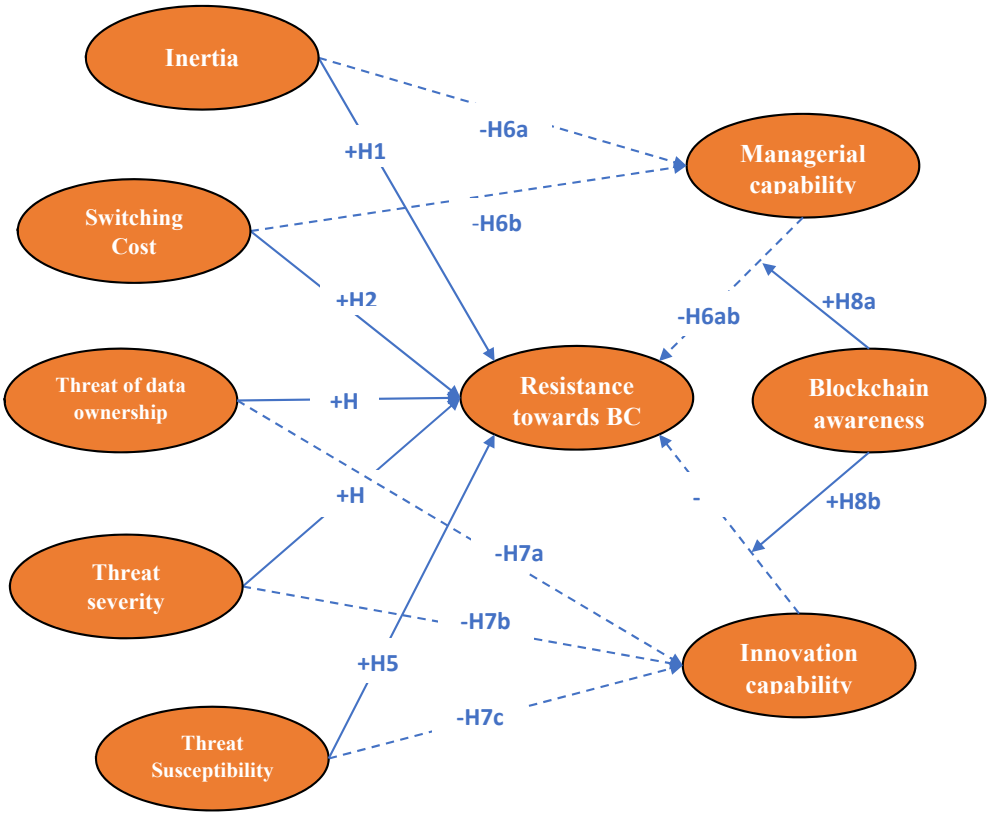

Fig. 1. Conceptual model of the study.

payment solutions (Kaur et al., 2020), eco-friendly cosmetics (Sadiq et al., 2021), mobile ticketing applications (Chen et al., 2022), and electric motor vehicles (Chen et al., 2018).

The IRT is an appropriate framework for assessing customer resistance to innovations because of its holistic approach (Ma & Lee, 2018). Previous research employing IRT has used usage, value, risk, tradition, and image as the significant customer-perceived barriers to examine the resistance approach. However, most IRT-related works focus on understanding the end-consumers resistance behaviour rather than understanding from the business decision-maker's angle. The present study has employed different variables falling under functional (active) and psychological (passive) barriers to fit in the model with the business customer rather than end customers, especially with respect to blockchain technology. The study has conceptualised inertia as a psychological barrier. Though previous studies have not employed inertia as a psychological barrier in IRT, Ram & Sheth (1989), have synonymously used passive resistance as inertia. IRT positions risk as a significant functional barrier. However, the risk is measured generically without any specificity. The present study introduces three specific threats associated with data and security as active barriers: the threat of data ownership, threat severity, and threat susceptibility. Data and its ownership in public and private blockchains are always a cause of concern for the stakeholders involved in the blockchain network (Zhang & Chen, 2019).

The threat of data ownership describes the retailer's concern about data misuse by any stakeholders in the blockchain ecosystem. Threat susceptibility is the degree to which an individual feels at risk of experiencing the threat, and threat severity is the extent of projected harm resulting from the threat (Witte and Allen, 2000). Another crucial functional barrier introduced is switching costs. Switching cost refers to the relative time and effort associated with transitioning to new technology (Balakrishnan et al., 2021). Overall, IRT imposes the ideology of the Status Quo Bias Theory (Kim & Kankanhalli, 2009). According to the SQB theory, people tend to stay in their current state despite the availability of alternatives or potential adjustments. So, building through the tenets of IRT, we propose functional and psychological barriers underlying blockchain transition that may lead to resistance towards adopting the blockchain ecosystem among retailers.

2.3. *Dynamic managerial capability*

This theory states that "managers with superior dynamic managerial capabilities can adapt and change more successfully than those with less effective or no dynamic managerial capabilities" (Helfat & Martin, 2015, p.40). Dynamic managerial capability is an extension of the dynamic capability model, which is grounded in the evolutionary theory of the firm (Nelson & Winter, 1982). One of the essential capabilities of managers is to sense, seize and transform the business ecosystem according to needs and for the organisation's benefit (Wong et al., 2020). The opportunity can revolve around any business orbit, including infrastructure development, technology transition, resource management, and strategic management. Technology development in business and the capability to handle growth is one of the challenging tasks for any manager. However, studies related to organisational change have addressed that decision-makers capability can reduce the effect of resistant behaviours (Giannoccaro, 2018). In this study, managerial capability can be explained as the retailer's competence and ability to plan for new technology implementation. Previous studies have supported that managerial capability can develop a risk-taking ability to build a competitive edge in the business (Kwak et al., 2018). Thus, there is the possibility that managerial capability can reduce the impact of functional and psychological barriers to building resistance towards adopting blockchain.

Besides managerial capability, innovation capability is another important factor determining a company's potential to succeed in the market. Innovation capability is described as its capacity to develop, accept, and apply new concepts, procedures, goods, or services (Wang & Dass, 2017). In the context of the study, innovation capability explains

the retailer's openness to promoting innovative culture in the organisation. Similar to managerial capability, innovation capability can endure risk-taking ability for the organisation's benefit (Camisón & Villar-López, 2014). Most studies have employed innovation capability to examine the firm performance and its impact on competitive advantage (Wang & Dass, 2017). Both managerial and innovation capabilities test the competence of the business managers and their strategic approach to decision-making. Present research employs the capability variables as a mediator to check whether the retailer's capability can reduce the barriers to resistance to adopting blockchain. Based on the above discussion, the study proposes the conceptual model in Fig. 1.

3. Hypotheses development.

3.1. Psychological barriers to resistance toward blockchain

Psychological barriers refer to an individual's perceptive beliefs that act as a hindrance to organisation transformation. Besides functional barriers, psychological barriers act as a roadblock to technology adoption (Balakrishnan et al., 2021). Psychological barriers refer to passive resistance preventing users from adopting the innovation cycle. From the viewpoint of dictionary definitions, inertia denotes "remaining at rest or in uniform motion in the same straight line unless acted upon by some external force". In the context of IS, Polites and Karahanna (2012; p.24) define inertia as a; "user attachment to, and persistence in, using an incumbent system (i.e., status quo), even if there are better alternatives or incentives to change". Though inertia is more recognised as individual psychological behaviour, research has suggested the same may extend to organisational format (Gligor et al., 2021). The study conceptualises inertia considering three major sub-dimensions, namely, cognitive, affective, and behavioural. Cognitive inertia explains a user's conscious decision to continue with the existing system. Whereas behavioural inertia and affective inertia refer to users' behavioural comfort in using the existing system, users enjoy or feel they associate with the existing system, thus not ready to move to the new one. In the context of this study, retailers might be comfortable with existing technology developments; transiting to the blockchain may have psychological roadblocks for them. Previous research has supported that implementing blockchain in the organisational ecosystem needs both functional and psychological transition among the stakeholders (Baruch & Rousseau, 2019). From the retailer's point of view, they are significant intermediaries in the supply chain by integrating the business with the customers. Previous research has supported the idea that transition in the organisation ecosystems also can reflect on various integrated connections such as relationships with the stakeholders, collaborative partner associations, organisational learning, and change management patterns (Shi & Zhang, 2018). Given the integrated effects present in the transition to the blockchain, the same may lead to an inherent psychological barrier among the retailers, subsequently leading to resistance. From the above proposition, the following hypothesis is proposed.

> Hypothesis 1: Inertia will have a positive impact on resistance toward blockchain

3.2. Functional barriers to resistance toward blockchain

Switching costs refer to customers' costs in switching over (Burnham et al., 2003). Previous studies have found the perceived functional and psychological costs associated with switching over to another technology may lead to resistance behaviour among consumers (Balakrishnan et al., 2021) and organisations (Walsh et al., 2021). Temerak and El-Manstrly (2019) categorised switching costs as evaluative and psychological risks. In other words, switching costs are associated with tangible calculative costs and the psychological effort and time a user needs to invest in switching over to a new system. The norm theory postulates that people are more likely to resent events resulting from their conduct than their inaction (Kahneman and Miller, 1986; Miller et al., 1990). The theory explains that many individuals anticipate losses and opportunities lost due to a new transition (Tversky and Kahneman, 1991). Subsequently, this loss aversion tendency may result in users retaining their existing system. Previous studies have documented that switching to the blockchain requires more risk-taking ability to overcome the underlying financial and psychological challenges (De Filippi et al., 2020). However, the effect of this switching cost and its impact on blockchain resistance is yet to be documented. Present retailers have robust enterprise resource planning (ERP) to connect and coordinate with their stakeholders (Garg & Garg, 2013). Switching to the blockchain may require additional modules or a complete changeover from their existing system. The tangible costs, time, and efforts necessary for the transition may instil psychological pressure among the retailers, which subsequently can impact blockchain resistance. Based on the discussion above, the following hypothesis is proposed.

> Hypothesis 2: Switching costs will have a positive impact on resistance toward blockchain

"Psychological ownership is a state in which individuals feel as though the target of ownership or a piece of that target is "theirs" (Pierce et al., 2003, p. 86). This theory's evolving piece has shown that psychological ownership may rest with physical and non-physical entities. For example, an individual can proclaim the ownership of a bicycle (physical entity) or an idea (non-physical entity). Morewedge et al. (2021) recollect psychological ownership in three present trends: sharing economy, digitalisation, and the expansion of personal data. Alongside the opportunities to preserve psychological ownership, there are underlying threats to the ownership. At functional and psychological levels, data preserving and maintaining ownership rights is a huge task to maintain these days. Blockchain is an example of such a phenomenon. Blockchains follow a decentralised data model, which facilitates the stakeholders in the blockchain ecosystem to access the data of others to infuse transparency. However, the transparency entailing blockchain is secured regarding the ecosystem's contracts. Blockchain networks exercise four kinds of smart contracts: smart registry contracts, smart dataset contracts, smart contract ownership, and smart contracts (Jaiman et al., 2022). Despite the secured network, the parties involved in the blockchain ecosystem tend to be careful about data breaches (Moin et al., 2019). Retailers have multiple pieces of information stored in their database and are given access to the blockchain ecosystem. The data becomes transparent to other stakeholders in the supply chain network (Jain et al., 2022). Sharing such information can be perceived as a threat from a retailer's point of view, underpinning both active and passive resistance. Thus, the study proposes that retailers' perceived threat of data ownership in the blockchain network will create resistance. The following hypothesis is proposed thus.

> Hypothesis 3: The threat of data ownership will have a positive impact on resistance towards blockchain

In this study's context, threat severity is a functional classification of data threats prevailing in the blockchain ecosystem. Threat severity can be explained as the degree to which an event can endanger self and others (Rogers & Prentice-Dunn, 1997). Different threats are apparent in information systems, such as; data and security, hacking, and financial fraud. Literature has fundamentally recognised data threats as a primary threat in IS. Though blockchain is proclaimed a secured technology, researchers question the ecosystem's operationality, which may lead to data misuse (Marikyan et al., 2022). Important data reaching the unintended hands may lead to enormous consequences, subjectively explaining the threat's severity. Originally threat severity was conceptualised from the understanding of the protection motivation theory (PMT) proposed by Rogers (1975), which explains the fear appeals and coping strategies. These coping strategies are framed based on the

severity of the threat, thus demanding the importance of studying threat severity (Floyd et al., 2000). As mentioned above, data accessibility is subject to approval from blockchain entities (Marikyan et al., 2022). Data security's integrity arises when the data access passes on to the next block of the supply chain. Retailers may perceive high threat severity because of the transparent network present in the blockchain. Based on the above discussion, the following hypothesis is proposed.

Hypothesis 4: Threat severity will have a positive impact on resistance toward blockchain

In continuation to threat severity, Rogers (1975) conceptualises threat susceptibility as an individual's perception of the probability that a threat can occur. Janz and Becker (1984) explain perceived susceptibility as an individual's belief and the likelihood of experiencing a given condition. Previous studies have found that when an IS user finds the threat more probable, the perception of the effectiveness and efficiency of the system declines (Johnston & Warkentin, 2010). Blockchain provides authentication methods to diffuse information across the ecosystem (Kumar et al., 2022), yet studies have addressed the threat factor that may prevail in the blockchain. The integrity of the supply chain partners is the key to establishing transparent relationships among the stakeholders. So, though the technology (blockchain) can provide secured benefits, the threat of data is always highly susceptible, given the stakeholders' interests and role in the ecosystem. Thus, retailers may be vulnerable to the data threat from the technology and stakeholders' angle. Based on the above discussion, the following hypothesis is proposed.

Hypothesis 5: Threat susceptibility will have a positive impact on resistance toward blockchain

3.3. Managerial and innovation capability as intervening variables

Dynamic managerial capability theory argues that managers with superior dynamic capability can progress well to adapt to new organisational changes (Ambrosini & Bowman, 2009). The theory also emphasises the manager's ability to sense the opportunity and foresee the organisation's developments. Between the cost and risk factors associated with Blockchain, the technology embarks various benefits in the supply chain network. Given the nature of the business, retailers reflect different levels of capability. Frasquet et al. (2018) conceptualise that a retailer exhibits brand building, channel management, adaptation, and knowledge management capability in a social cycle. Among all, adaptation capability is more crucial is information systems implementation because of the changing technological paradigm. However, adapting to a new technological change requires more internal (psychological) and external (environmental) stability. Managers' psychological insecurities can be overshadowed by their underlying capabilities. Retailers' capability to operationalise and strategise blockchain activities is required to build a thriving blockchain-based supply-chain ecosystem. But it is unknown whether their capabilities can mitigate psychological barriers such as inertia in the implementation process. From a rational point of view, capability can reduce inertia's impact on blockchain resistance among retailers. Based on the discussion, we propose the following hypothesis.

Hypothesis 6a: Managerial capability will negatively mediate the relationship between inertia and resistance toward blockchain

Early mover advantage (EMA) theory suggests that early movers and adopters in the marketplace have a relative advantage in creating competitive strength in the market (Lieberman & Montgomery, 1988; Frawley & Fahy, 2006). Despite the EMA's lucrativeness, businesses will be reluctant to adopt a new technology or enter a new market because of specific psychological and functional barriers. Wang et al. (2016) posit that businesses with high resources and capabilities can exploit EMA's to their benefit. One of the significant barriers to EMA is the switching costs and its economic underpinnings, which need higher planning to mitigate the risk (Kerin et al., 1992; Argyres et al., 2019). Previous research has supported organisational capability and mitigated these risks to move forward with their strategic overview (Argyres et al., 2019). In the context of this study, retailers with high managerial capability may not be concerned about the risks underlying the technology transition, which includes the case of switching costs. Though blockchain involves costs associated with switching to new technology, retailers with high managerial capability may have less concern about it, thus resulting in reduced resistance towards blockchain. Likewise, managerial capability can enhance the calculated decisions, which allows them to analyse the switching costs with the value scenario allowing them to have a lesser impact of switching cost towards resistance. Based on the above discussion, we propose the following hypothesis.

Hypothesis 6b: Managerial capability will negatively mediate the relationship between switching costs and resistance toward blockchain

The threat of ownership regarding who handles the data in the blockchain network is a concern. Because data buyers can assert ownership of the purchased data, data ownership is uncertain (Gupta et al., 2022). Gupta et al. (2022) also emphasise that data reselling and payment data leaking can be possible in a blockchain network. As mentioned above, these security threats and fear of data leaking can lead to resistance toward blockchain. In contrast to the ownership threat, the data can also be viewed as a strategic resource aiming to build a lucrative blockchain ecosystem. The resource-based view (RBV; Barney, 1991) suggests considering and using the resources as strategic drivers to benefit competitive advantage and instil innovation (Najafi-Tavani et al., 2018). Mention (2011) explains that collaboration with business stakeholders' networks is crucial for building an innovation ecosystem. An innovative retailer can be open to new ideas and expect the stakeholders to participate in the network to create an innovative ecosystem. In that case, the concern for data ownership will be seen as a beneficial aspect rather than a threat, as how the ecosystem uses data to create an innovative network. Thus, innovative capability can negatively intervene in the threat of data ownership to resistance towards blockchain. Based on the discussion above, we propose the following hypothesis.

Hypothesis 7a: Innovation capability will negatively mediate the relationship between the threat of data ownership and resistance toward blockchain

Previous research has proposed that organisations facing severe external and internal environmental threats mitigate their risks with their dynamic capabilities (Arthurs & Busenitz. 2006; Santa-Maria et al., 2022). Threat severity refers to an IS user's fear of an unfavourable consequence in the system. Previous research has supported that dynamic organisational capability is majorly driven by leadership qualities (O'Reilly & Tushman, 2008), who tries to be positively motivated to take risks (Schoemaker et al., 2018). Innovation capability is scripted with more risk-taking elements, in which the manager may welcome the underlying threats. In the case of data threats and severity perceptions, innovation capability may be open to these threats and place control measures to mitigate the risk. However, managers with high innovative capability can mitigate the threat severity (Carrasco-Carvajal & García-Pérez-De-Lema, 2021). Retailers in blockchain who are more inclined to innovative capability may have a negative aversion towards data threats and their severity. Especially retailers who promote innovative ideas may be inclined to overcome the threats. Such inclination may reduce the impact of resistance toward blockchain. From the above discussion, the following hypothesis is proposed.

Hypothesis 7b: Innovation capability will negatively mediate the relationship between threat severity and resistance toward blockchain

Threat susceptibility is more of a belief in the likelihood of the consequence (Orji et al., 2012). Similar to threat severity, threat susceptibility is grounded on various psychological theories. Dynamic capability models have explained that leaders or managers tend to mitigate the risk perceptions to progress further in organisational development (Schilke, 2014). Thus, the psychological fear and beliefs associated with data threats (susceptible) can be mitigated by the innovative capabilities of the managers. Retailers can be susceptible to various risks related to the transformations within or outside the organisations. Data threat is inevitable, which may produce susceptibility to transformation. However, retailers with high innovation capability can be open to taking risks and may have a careful evaluation pattern to understand the foundations of their psychological beliefs, basically with a high self-efficacy mechanism. Thus, those retailers can overcome the susceptible fears, reducing the effect of resistance toward blockchain. Therefore, from the above discussion, the following hypothesis is proposed.

Hypothesis 7c: Innovation capability will negatively mediate the relationship between threat susceptibility and resistance toward blockchain

3.4. Blockchain knowledge as moderator

Previous studies have supported that knowledge about the external and internal environment is crucial to building organisational capability (Awan et al., 2021). However, to our knowledge, there is no empirical evidence to understand how technology knowledge can interact with the dynamic capability models. Managerial capability explains the competence and ability to perform an activity efficiently (Helfat & Peteraf, 2015). Both competence and ability depend on the underlying knowledge about the technology, event, strategy, or organisation. Knowledge about the technology will allow the managers to understand the impact of the resistant factors by leveraging the cost-benefit scenario. As well as, the managers with high capability will try to overcome the resistance based on the available knowledge about the blockchain. Thus, retailers with high managerial capability and with increased knowledge about the blockchain may have less impact on resistance towards blockchain. Therefore, to test this assumption, we propose the following hypothesis.

Hypothesis 8a: Blockchain knowledge can moderate the causal relationship between managerial capability and resistance toward blockchain

Awareness and knowledge are the main antecedents that build open innovation (Hutton et al., 2021). Previous studies have supported that innovative behaviours and implementation are outcomes of knowledge about the process and organisations (Yuan & Woodman, 2010). Innovative capabilities are driven based on the available information about the organisation and in the market scenario. In a technology context, knowledge about the technology will be crucial to implement the technology successfully. Ruiz-Jiménez and del Mar Fuentes-Fuentes (2013) supports that knowledge about the technology will help managers arrive at stabilised decisions about any investment or innovation. Since blockchain involves more avenues of innovative improvements, knowledge about the blockchain will allow managers to perceive high innovative scope in the technology. Thus, retailers' knowledge about the blockchain can accelerate the negative effect of the innovative capability to resistance to the blockchain. Based on the discussions, the following hypothesis is proposed.

Table 1
Socio-demographic information about the respondents (n = 360).

	Variables	Characteristics	Count	%
CE	Age of the Organisation	Less than 10 years	41	11.39
		11 to 20 years	85	23.61
		21 to 30 years	156	43.33
		Above 30 years	78	21.67
CE	Organisation size (Employees)	Less than 30	28	07.78
		31 to 100	144	40.00
		101 to 200	126	35.00
		Above 200	62	17.22
OE	Industry type	Fashion and Apparel	76	21.11
		Food and Nutrition	28	07.78
		Household and appliances	62	17.22
		Healthcare and cosmetics	30	08.33
		Home furnishing	33	09.17
		Electronics and IT	75	20.83
		Fast Moving Consumer Goods	56	15.56
OE	Most used technology in supply chain interactions	QR and Bar Codes	8	02.22
		Automated solutions	19	05.28
		ERP & MIS	28	07.78
		Digital communications	43	11.94
		CRM	33	09.17
		Inventory management software	12	03.33
		Distributor and Company connected mobile apps	76	21.11
		Kiosks	8	02.22
		Vendor management software	23	06.39
		Digital payments	79	21.94
		Sales Dashboards	31	08.61
OE	Respondent position in the organisation	Head Store manager (Middle level)	63	17.50
		Area manager (Middle level)	159	44.17
		Regional manager (Senior level)	107	29.72
		Product manager (Top level)	31	8.61

CE denotes Close Ended Questions; OE denotes Open-Ended Questions.

Hypothesis 8b: Blockchain knowledge can moderate the causal relationship between innovation capability and resistance toward blockchain

4. Methods

4.1. Research design and operationalisation

The study follows a single cross-sectional research design with data collected from retailers from India. The sample was collected at three product launch events and two entrepreneurs' events/meetings held in India. The data concerning the study is collected from 360 retailers of different industry types. The retailers had a wide range of knowledge about emerging technologies related to retailing, and the approached retailers had a good awareness of blockchain and its role in supply chain and retail. Based on the data collected from the event organisers, more than 1500 retailers attended the meeting. However, all 1500 were not representative of the intended sample. During the event, with the help of organisers a 15-minute session was conducted, themed to explaining the role of blockchain in retailing and supply chain. Based on the session interactivity, 768 retailers were identified as the prospective audience interested in learning more about blockchain and its implementation yet reluctant to implement it immediately. Of the 768 retailers, 380 retailers kindly agreed to participate in a survey. Finally, 360 usable samples were obtained. A brief description of the retailers' profiles is given in Table 1. The sample was collected within two months, and the periodical samples were compared to see whether they were significant across the data collection intervals. The results showed that none of the variables

Table 2
Results of Measurement Model (CFA).

Construct	Items	Mean	Std. Dev	Factor Loadings	CA	AVE
Cognitive Inertia	IC1	3.0222	1.51301	0.968***	0.918	0.904
	IC2	3.0083	1.46546	0.943***		
	IC3	3.1750	1.61812	0.871***		
Affective Inertia	IA1	2.9083	1.48153	0.841***	0.809	0.686
	IA2	3.0667	1.57133	0.803***		
	IA3	3.0556	1.57884	0.799***		
Behavioural Inertia	IB1	3.0944	1.51941	0.824***	0.818	0.785
	IB2	3.1639	1.63810	0.882***		
	IB3	3.0528	1.49651	0.826***		
Sunk Cost	SC1	2.8556	1.71710	0.827***	0.837	0.733
	SC2	3.0611	1.75891	0.775***		
	SC3	2.9667	1.71800	0.872***		
Threat of Data Ownership	TDO1	4.0417	2.26784	0.924***	0.965	0.825
	TDO2	4.2028	2.22307	0.955***		
	TDO3	4.0972	2.21391	0.936***		
	TDO4	4.0139	2.15482	0.911***		
Threat severity	TS1	3.9028	2.17199	0.912***	0.875	0.907
	TS2	4.0417	2.17249	0.952***		
	TS3	3.8722	2.12697	0.888***		
	TS4	3.8028	2.09323	0.921***		
Threat Susceptibility	TSS1	3.2556	1.73646	0.915***	0.822	0.607
	TSS2	3.2083	1.76264	0.861***		
	TSS3	3.1333	1.72448	0.889***		
Managerial Capability	MC1	4.9833	1.97188	0.964***	0.917	0.815
	MC2	5.0139	1.89482	0.953***		
	MC3	4.9194	1.96676	0.916***		
Innovation Capability	ICC1	4.4778	1.85237	0.931***	0.961	0.892
	ICC2	4.4667	1.80652	0.922***		
	ICC3	4.5611	2.04453	0.946***		
Blockchain Resistance	BR1	3.4861	1.79750	0.921***	0.960	0.857
	BR2	3.4917	1.82826	0.933***		
	BR3	3.3778	1.64259	0.911***		
	BR4	3.4194	1.56357	0.956***		
Blockchain Awareness	BA1	4.7083	1.54629	0.910***	0.938	0.836
	BA2	4.5611	1.53207	0.913***		
	BA3	4.8944	1.75044	0.811***		

Note: CA represents "Cronbach's Alpha"; AVE represents "Average Variance Extracted"; CFA Fit indices: $\chi 2/df = 2.83$; GFI = 0.922, CFI = 0.945, (Good fit >0.9); RMSEA = 0.057 (Good fit <0.06); Note: ***denotes $p < 0.001$.

were significantly different across the data collection intervals. This exercise confirms that the data is free from non-response bias issues.

4.2. Survey instrument

The survey instrument consisted of scale information and socio-demographic information about the retailers. The first part of the questionnaire had detailed explanation about the survey followed by study items. The second part of the questionnaire consisted of brief profile information about the retailers. All the scales used in the study are derived from previous studies. The measurements were recorded on a seven-point Likert scale, with seven being very strongly agreed and one very strongly disagreeing. The items for inertia are derived from Polites and Karahanna, (2012) and Raddatz et al. (2021), the items for switching cost are derived from Polites and Karahanna, (2012) and Balakrishnan et al. (2021), and the items of the threat of data ownership are reframed based on the research by Dinev and Hart, (2006). Raddatz et al. (2021), the items for threat severity and threat susceptibility are derived from Johnston and Warkentin (2010) and Raddatz et al. (2021), the items for managerial capability and innovation capability are derived from Park et al. (2021), the items for resistance towards blockchain is derived from Kim and Kankanhalli (2009) and Walsh et al. (2021). The items for blockchain awareness are derived from Soto-Acosta et al. (2018). Given that items of the questionnaire are derived from previous studies, we performed a qualitative pilot study in which 13 retail managers and 7 academic experts evaluated the measurement items of the study constructs. After three iterations of evaluation by the experts, the measurement items were reframed and corrected to fit the study objectives and context. The final iterated data showed good reliability (above 0.70) for all the constructs. Appendix A shows the study constructs and scales.

4.3. Analyses

The study uses a two-step structural equation modelling (SEM) procedure to test the proposed hypotheses and the model. To execute this methodology, the confirmatory factor analysis (CFA) was first performed to test the validity and reliability requirements. The CFA confirms the presence of content validity, convergent validity, discriminant validity, and reliability. Next to the CFA, structural equation modelling analysis is performed to test the model and hypotheses. The study used the maximum likelihood method to estimate the CFA and SEM model measurements. SEM without mediation effect provides the direct or causal effect of the exogenous variables on endogenous variables. In contrast, this study employs managerial capability and innovation capability as mediating variables in the relationship of inertia, suck cost, the threat of data ownership, threat severity, and threat susceptibility to resistance to the blockchain. The total, direct, and indirect effects allow learning the nature of the relationships present in the model. In addition to the mediation analysis, the model also tests the moderation effect of blockchain knowledge in the relationship of managerial and innovation capability to resistance towards blockchain. All the analyses were executed through SPSS 27.0 and SPSS AMOS 27.0 software.

Table 3
Discriminant validity and descriptive statistics of measures.

	IA	SC	TDO	TS	TSS	MC	ICI	RES	BA	IC	IB
IA	**0.766**										
SC	0.665	**0.796**									
TDO	0.179	0.036	**0.962**								
TS	0.106	−0.066	0.764	**0.952**							
TSS	0.691	0.523	0.092	0.003	**0.779**						
MC	−0.281	−0.282	−0.327	−0.149	−0.249	**0.956**					
ICI	−0.198	−0.183	−0.407	−0.205	−0.165	0.754	**0.944**				
RES	0.432	0.411	0.433	0.260	0.402	−0.681	−0.668	**0.926**			
BA	0.063	0.026	−0.129	−0.101	0.036	0.153	0.349	−0.023	**0.914**		
IC	0.691	0.426	0.139	0.094	0.500	−0.202	−0.128	0.326	0.036	**0.826**	
IB	0.692	0.421	0.147	0.100	0.507	−0.204	−0.120	0.336	0.051	0.720	**0.746**

The diagonals value represents $\sqrt{AVE}$; and the off-diagonal values represent inter-construct correlations for respective variables.
Notes: IA denotes affective inertia; SC denotes sunk cost; TDO denotes threat of data ownership; TS denotes threat severity; TSS denotes threat susceptibility; MC denotes managerial capability; ICI denotes innovation capability; RES denotes resistance towards blockchain; BA denotes blockchain awareness; IC denotes cognitive inertia; IB denotes behavioural inertia.

Table 4
Standardised estimates of the proposed model.

Hypotheses	Exogenous Variable	Endogenous Variable	Model 1 Coefficients	Model 2 Coefficient	Model 3 Coefficient
Hypothesis 1	Inertia	Resistance towards Blockchain	0.085 ^{ns}	0.085 ^{ns}	
Hypothesis 2	Switching Cost		0.181***	0.181***	
Hypothesis 3	Threat of Data Ownership		0.341***	0.341***	
Hypothesis 4	Threat Severity		0.237***	0.237***	
Hypothesis 5	Threat Susceptibility		0.168***	0.168***	
Hypothesis 8a	Managerial Capability × Blockchain Knowledge			0.098**	
Hypothesis 8b	Innovation Capability × Blockchain Knowledge			0.107***	
Causal Effect	Managerial Capability				−0.340***
	Innovation Capability				−0.270***

Notes: *** represent values significant at 99% confidence level; ** represent values significant at 95% confidence level.
Model fit indices: $\chi 2$ /df = 2.98; AGFI = 0.918; NFI = 0.905; CFI = 0.916; RMSEA = 0.072.

5. Results

5.1. Confirmatory factor analysis

The factor loadings of all the constructs were found to be above 0.60 and were significantly associated with the constructs. Also, Cronbach's reliability and composite reliability of the constructs were found to be above 0.700, confirming the scale is free from systematic and measurement error and consistent (Portney and Watkins, 2000). Thus, the results confirm the presence of content validity and reliability requirements in the scale (Nunnally, 1978). The item-wise standardised loadings are presented in Table 2. Notably, the construct inertia is evaluated as a second-order construct, and the first-order constructs, cognitive inertia (0.788), affective inertia (0.812), and behavioural inertia (0.826), were found to be consistently associated with the latent factor. Table 2 also shows that the average variance extracted (AVE) for each construct is above 0.500. This result confirms the convergent validity requirements (Fornell and Larcker, 1981). Table 3 shows the inter-correlation values and squared root of AVE values in the diagonals. Table 3 also shows that the inter-correlation values of the constructs are lesser than the squared root of AVE for the respective construct. This result confirms the discriminant validity requirements (Fornell and Larcker, 1981). Overall, the CFA model ensures the content, convergent, and discriminant validity requirements proposed by Bagozzi et al. (1991) and Fornell and Larcker (1981). The CFA model indices is presented in the footnote of Table 2. The fit indices of CFA are found to be good (Kline, 1998; Byrne, 2010; Hair et al., 2012), confirming the satisfactory condition for performing SEM analysis.

As a part of the CFA, we also tested the common method bias issues (CMB) issues using common latent factor (CLF; Podsakoff et al., 2003) method. The CLF model is used to examine the common variance present in the measurement model. A common factor is introduced in the model with a path included to each item in the existing CFA model, adding "1″ as a constraint to the common construct. Such a model explains the common variance shared by each construct concerning the study. Then the standardised estimate in the constrained model with the unconstrained model is compared to check the deviation between the two estimates. Mostly a deviation of about 0.05 is allowed in the model. In this study, estimates between CLF (constrained) and non-CLF (unconstrained) models ranged from 0.002 to 0.041. Thus, confirming the measurement is free from CMB issues (MacKenzie and Podsakoff, 2012).

5.2. Structural equation modelling

The SEM model tested the proposed hypotheses using the maximum likelihood estimation model. Table 4 shows the hypothesis-wise results of the model, and the fit indices are given in the footnote of the table. The model showed good fit indices, confirming the estimated model's robustness. Except for hypothesis 1, the remaining hypotheses are significantly related to resistance towards blockchain in the direct causal model. Of all the hypotheses, the threat of data ownership was highly associated with resistance towards blockchain, and threat susceptibility is found to have lesser coefficient value than other hypotheses. Hypothesis 1 investigated the relationship of inertia to resistance toward blockchain, and the relationship was found to be insignificant at a 95 % confidence level. Hypothesis 2 investigated the relationship of switching cost to resistance towards blockchain, the results showed significant results, but the coefficient is less than 0.200, indicating a weak relationship. As mentioned above, hypothesis 3 was found to be highly significant compared to other relationships. This hypothesis investigated the relationship of the threat of data ownership to blockchain resistance, and the coefficient is found to be near 0.350, which is a relatively better result. Hypothesis 5 investigated the relationship of threat severity to resistance toward blockchain, the result showed the relationship is significantly supported. Besides the hypotheses, the causal relationship between managerial and innovation capability is tested. The results of both the relationships were found to be significant. Thus, confirming that managerial capability and innovation capability are negatively related to blockchain resistance. The r^2 of resistance towards blockchain is 0.374, which explains that the exogenous variables explain 37.4 % of the total variance in the total model.

5.3. Mediation and moderation analysis results

The indirect effects are calculated while testing the SEM in AMOS. The significance of the total, direct, and indirect model is tested using bias-corrected method at a 95 % significance level with bootstrapping to 5000 samples. Hypothesis 6ab investigated the mediation role of managerial capability in the relationship of inertia and switching cost to resistance towards blockchain. The results showed that managerial capability significantly created a negative indirect effect in the model. The results imply the positive direct effect between inertia and switching cost to resistance towards blockchain is reduced by managerial capability. However, the relationship between inertia and resistance towards blockchain was not significantly related in the causal model. Thus, hypothesis 6a cannot be attributed to the results of inertia. Yet the indirect effect concerning switching costs to blockchain resistance is higher than other effects. The effect of managerial capability reduces the impact of resistance, so the total effect of switching cost to resistance becomes negatively related. Hypotheses 7abc investigated the indirect effect of innovation capability in the relationship between data ownership threat, threat severity, and threat susceptibility to resistance towards blockchain. The results showed that innovation capability significantly created a negative indirect effect on the threat of data ownership and threat susceptibility to resistance to blockchain but failed to significantly influence the relationship of threat severity to resistance to the blockchain. Innovation capability negatively intervenes in the relationship of the threat of data ownership to resistance towards blockchain, yet the total effect remains significantly positive in the relationship. In contrast, the total effect of the relationship of threat susceptibility to resistance

Table 5
The results of total, direct, and indirect effects in the model.

Effects	Effects of INER on RES mediated through MC	Effects of SC on RES mediated through MC	Effects of TDO on RES mediated through ICI	Effects of TS on RES mediated through ICI	Effects of TSS on RES mediated through ICI
Total Effects (std. error, lower bound, upper bound)	−0.086 ^{ns} (0.063, −0.312, 0.121)	−0.115** (0.068, −0.412, 0.087)	0.130*** (0.075, −0.098, 0.357)	0.181*** (0.060, −0.012, 0.411)	0.019 ^{ns} (0.066, −0.192, 0.275)
Direct effect (std. error, lower bound, upper bound)	0.085 ^{ns} (0.056, 0.256, −0.124)	0.181*** (0.063, 0.480, 0.010)	0.341*** (0.058, 0.507, 0.112)	0.237*** (0.056, 0.476, 0.031)	0.168*** (0.064, 0.346, −0.080)
Indirect effect (std. error, lower bound, upper bound)	−0.171** (0.024, −0.357, 0.091)	−0.296*** (0.028, −0.456, −0.002)	−0.211*** (0.042, −0.422, 0.015)	−0.056 ^{ns} (0.030, −0.256, 0.156)	−0.187*** (0.019, −0.382, 0.056)

All the estimates are standardised and *** denotes values significant at 99 % level and ** denotes values significant at 95 % level: n = 360, bootstrap iterations = 5000. (Bias corrected method).
Notes: INER denotes inertia; SC denotes sunk cost; TDO denotes threat of data ownership; TS denotes threat severity; TSS denotes threat susceptibility; MC denotes managerial capability; ICI denotes innovation capability; RES denotes resistance towards blockchain; BA denotes blockchain awareness.

towards blockchain was turned insignificant because of the intervening effect of innovation capability. The complete results of the mediation model are given in Table 5. The moderation results showed positive interaction between blockchain knowledge and managerial and innovation capability. However, the interaction effect is relatively less compared to other coefficients. The interaction effect between managerial capability and blockchain knowledge is found to be significant at a 95 % level. So, for every change, one scale increase in blockchain knowledge can increase the existing relationship of the managerial capability to resistance to the blockchain by 9.8 %. Similar results can be seen in the interaction between innovation capability and blockchain knowledge. For every change in scale, the existing relationship between innovation capability and resistance to blockchain increases by 10.7 %. Yet, this interaction is significant at a 99 % confidence level.

6. Discussion and implications

This research employed 360 retailer samples to test the proposed model frame through the lenses of various theoretical backgrounds and literature arguments. Overall, twelve hypotheses were tested using a structural equation modeling conceptual model. The results showed that except inertia the remaining variables could significantly relate to resistance toward blockchain. The results shed meaningful insights and light on several points of discussion from academic and managerial perspectives. The remaining section of the discussion is focussed on discussing the results and highlighting how these results can contribute to the academic and managerial background.

6.1. Discussion of results

Most of the research concerned with exploring the relationship of inertia to resistance has found a positive relationship in the path, both from a consumer perspective (Balakrishnan et al., 2021). Yet, this study found the results concerned with this path to be insignificant. Though no direct literature supports this result, from a rational point of view, the result can be decoded in two ways. First, the relationship between inertia and resistance has no comprehensive results concerning retailers and blockchain perspectives. Second, previous studies have supported the psychological strength of business leaders is relatively higher (Rego et al., 2012). Given the high mean capabilities scores, the retailer sample looks more functionally equipped with dynamic capabilities. Thus, their psychological underpinnings to rationalise their decision to resistance towards blockchain may be weak. So, the results can be viewed from multiple angles. Yet, the result will open a new line of discussion in the research concerned with blockchain adoption and resistance specific to retailers. Hypothesis 2 results are consistent with previous studies (Polites & Karahanna, 2012; Balakrishnan et al., 2021). Switching costs can impart both psychological and functional level barriers, since it incorporates both functional and psychological costs involved in the transition. Given the nature and complexities involved in blockchain (Zhang et al., 2020), retailers would have considered switching costs a significant hindrance to transition, thus subsequently resulting in resistance behaviour.

The result of the threat of data ownership and its relationship to resistance toward blockchain (hypothesis 3) is relatively novel. Previous studies have supported that data security and transparency (Toufaily et al., 2021) is critical in adopting technology; the lack of data transparency can also result in building resistance behaviour. This study has extended such understanding from a data ownership perspective. Entities present in the blockchain gain access to the whole blockchain network data or partial network data to process transactions or business information. This process allows the stakeholders to gain ownership of the data. Despite the case transparency, data misuse is always a hindrance for retailers. This research supports such a hypothesis. Threat severity was significantly related to resistance toward blockchain (hypothesis 4). Threat severity majorly explains the perceived consequence because of the data breach. Previous research has found that threat severity will strongly predict resistance/avoidance toward technology (Liang & Xue, 2010).

On the other hand, research has also found that threat severity has an insignificant relationship with technology avoidance (Gillam & Waite, 2021). Thus, this result can be more representative to blockchain resistance. The retailers perceive that the consequence of a data breach in blockchain can be severe, and it cannot be compromised. Thus, the resistance mentally is in place. Threat susceptibility explains the possibility that the breach can occur. Liang and Xue (2010) state that threat severity and susceptibility are similar dimensions of threat and will have a high correlation. Thus, when one variable fails to create significance, the other will likely exhibit a similar result. The result of hypothesis 5 shows the same. The result implies that threat susceptibility about the data breach can positively create resistance towards blockchain. The retailers in the blockchain network are expressing a possibility that the data can be breached in the blockchain ecosystem. Susceptibility is a potential hindrance that can restrict the retailers' psychological tendencies to look at the scope of blockchain. Overall all three threats (threat of data ownership, threat severity, and threat susceptibility) are more significant barriers to building resistance in the blockchain network.

Shen et al. (2022) found that digital dynamic capabilities can positively mediate to increase digital adoption tendencies. Similary, Lin et al. (2016) found that dynamic capability can, directly and indirectly, influence innovation adoption. However, no study has supported how these dynamic capabilities can reduce the impact of resistance tendency. Hypotheses 6ab and 7abc investigated such effect to understand how

managerial capability and innovation capability can indirectly mitigate the resistance towards blockchain. The results of 6ab showed that managerial capability has a positive indirect effect on the relationship of inertia and switching cost to resistance towards blockchain. Managerial capability is mainly associated with competence connected with organisation performance. In the context of blockchain, retailers with high managerial competency are not seeing inertia and switching costs as major threats. Bogers et al. (2019) confirm that dynamic managers put back cost factors to attain a competitive advantage in the market.

Transition to blockchain has been represented as one of the competitive benefits in the market scenario (Bürer et al., 2019). Thus, capable retailers can consider blockchain's benefits, allowing them to forego the cost hindrances incurred during the switch. Hypothesis 7abc found that innovation capability can indirectly influence the relationship between the threat of data ownership and threat susceptibility to resistance towards blockchain. Ashrafi et al. (2019) find that innovation capability is more agile, which strives to improve organisational performance. In another context, Barlette & Baillette (2022) addresses that agility-based organisation leadership can view data analytics as an opportunity to overcome data-based threats. Previous literature ascertains innovation capability as a competence that includes an agile mindset to use data for the organisation's growth. In this study, though data ownership and data susceptibility are perceived as significant risks, the innovation capability indirectly reduces its impact on building resistance tendency. Thus, retailers with imprinted innovation capability can see data sharing and management as an opportunity more than a threat for the benefit of upscaling the organisation with a competitive advantage. The series of results logically fit with the results arrived with hypotheses 8a and 8b. The results showed that blockchain knowledge can increase the negative relationship between capabilities and resistance towards blockchain when interacting with managerial and innovation capability. Acharya et al. (2022) confirm that technology knowledge can interact positively with capabilities. Shafique et al. (2022) state that knowledge management capability can influence innovation adoption. The importance of capability is highlighted by this result, especially when interacting with blockchain knowledge. The results also infer that managers capability can get accelarated because of the blockchain knowledge, which has a lesser impact on resistance behaviour. Of both, innovation capability is considered to be the most important compared to managerial capability while interacting with blockchain knowledge. Building from these results, it can be rationally inferred that blockchain knowledge is crucial to improve managerial and innovation capability and can reduce the resistance tendency.

6.2. Theoretical implications

The study results offer and extend meaningful implications to the academic literature concerned with blockchain implementation and resistance, dynamic capabilities, innovation resistance, knowledge management practices, and retailers' resistance towards blockchain. Besides a broad literature addition to the available pool of knowledge, the results also extended the foundations of various theoretical propositions. Thus, the study results offer meaningful insights on the following grounds: (1) the innovation resistance theory is extended from the preview of blockchain and threats associated with data ownership, severity, and susceptibility, (2) The dynamic capability theories are examined through the lens of managerial capability and innovation capability to understand its indirect effect, (3) The study has used norm theory (Kahneman and Miller, 1986; Miller et al., 1990), psychological ownership (Pierce et al., 2003), protection motivation theory (Rogers, 1975), early mover advantage theory (Lieberman & Montgomery, 1988; Frawley & Fahy, 2006), and resource-based view (Barney, 1991) as a foundation to propose the study objectives. Thus, the hypothesis results will extend the knowledge available of these theories. (4) The research has given new insights to blockchain implementations and resistance research researchers and has extended the available knowledge in that area.

Innovation resistance theory (Ram & Sheth,1989; Heidenreich & Handrich, 2015) proposed passive and active barriers to understanding the resistance to the innovation cycle. However, Previous research which has employed IRT has used usage, value, risk, tradition, and image as the significant customer-perceived barriers to examine the resistance approach. This research has provided new variables under the umbrella of IRT in terms of psychological and functional barriers. The variables are borrowed from the status quo bias theory (inertia and switching cost) and literature relevant to data security and threats. Thus, this study has built a new dimensional structure to innovation resistance theory under a psychological and functional setup.

Moreover, the study has integrated a new dimension in security threat-related research by introducing ownership of data threats as a potential variable under the IRT framework. Most studies employing dynamic capability theory used capability as a predictor variable or a target variable. This research has attempted to understand the indirect effects of dynamic capability constructs. The previous study has used different capability variables such as adaptive, absorptive, relational, operational, and strategic capability; this study has extended the knowledge available in this domain by employing managerial capability and innovation capability in the same causal model. This research has tailored the dynamic capability framework concerning the blockchain perspective by operating so. From one angle, this research has studied the resistance behaviour among retailers. From another angle, the strategic capability underlying the retailers is exposed. So by bringing both into a singular model, the study can lend researchers to build strategic frameworks by considering behavioural modifications such as resistance, implementation, and continuation, which are very specific to the blockchain.

As mentioned before, the study knowledge of various theories builds the study's hypotheses. Norm theory is mainly postulated under the existing belief system that results in individuals expecting losses and acting upon them. Most of the norm studies focus on examining value belief models (Abdullah & Brown, 2011); this research has extended the understanding from an organisational transition perspective. The idea of psychological ownership is predominantly used in organisation ownership-based model. Still, this research has extended the theoretical lens to data ownership models to explain how the same can threaten organisations or managers. Protection motivation theory (PMT) is a fear appeal used in environmental and clinical research (Eberhardt, & Ling, 2021). This research has extended the applications of PMT by introducing the data threat factors under its banner. Early mover advantage is an innovation paradigm expressing the organisation's benefits from being an innovator. This study adds to the theory by introducing innovation capability as an underlying construct that can indirectly reduce resistance's impact. Global businesses see a great future in blockchain development. Academics support the view by investigating different nuances associated with blockchain technology. This research adds fuel to it by exploring the resistance tendency among retailers. The results of this study will aid researchers who aim to investigate supply chain-based blockchain implementation. Literature in retail technology has not touched on blockchain implementations or resistance, and this research sheds light on this area.

6.3. Practical implications

Besides the academic contributions, this research also provides an important outlook for retailers, supply chain partners, business managers, and technology managers. Retailers can self-address their limitations to the model based on a holistic view. The data security issues threaten retailers, but the fact that blockchain can sustain security should be known to the retailers. The lining between transparency and security needs to be addressed clearly to retailers to reduce the ambiguity concerned with blockchain. Thus, the supply chain partners should enlighten or invest in knowledge programs to discuss data security issues

and develop a secured structure. One of the major threats that even innovation capability failed to influence is threat severity, which shows that retailers are anticipating severe consequences because of the data breach. It is the responsibility of every partner in the supply chain ecosystem to develop a trust-based network that can help in building a sustainable business. The same applies to blockchain networks too. Besides gaining more knowledge about data security in blockchain, retailers can also explore diversified blockchain ideas to mitigate the risk better. Instead of adding all the stakeholders in the blockchain, retailers can choose the necessary stakeholders who should be included in the block. This strategy can reduce the data ownership risk in blockchain, and the corridor of uncertainty can be tightened.

More importantly, the knowledge about blockchain is more niche among retailers. Though the knowledge about fundamental aspects of blockchain is well received, the technical nuances associated with the blockchain must be decoded. Especially, the smart contracts present in the blockchain and the private keys should be enlightened to retailers to impose clarity in the blockchain. The supply chain is a more integrated network where all stakeholders' collaboration demands participation, so it is a mutual interest in the supply chain that every stakeholder should assist others in diffusing necessary knowledge about the supply chain to mitigate the threat. The model in a holistic picture expresses that the psychological barrier is not much, but the functional threats are more. Thus a detailed strategy should be developed in the supply chain to resolve these functional barriers.

7. Conclusion, limitation, and future research directions

Blockchain research is steadily increasing, and more inclined to learn the implementation plans across the supply chain. Yet the implementation of blockchain in the supply chain in the global scenario is still less. This research focussed on understanding the resistance tendency among retailers. To operate the study, we proposed a conceptual model from the lens of innovation resistance theory and dynamic capability modelling and tested the model with 360 retailer data. The results showed that the threat of data ownership is the most significant variable that builds resistance towards blockchain, followed by threat severity. The results conclude that retailers are more inclined to functional threats than psychological barriers, which can lead to resistant tendencies. Managerial capability and innovation capability are vital variables that reduce the impact of the proposed variable to resistance to the blockchain. Improving managerial and innovative capability for self and organisation can help retailers and managers sustain the competitive market. Knowledge creation about blockchain is crucial to building a fruitful capability to reduce resistance behaviour. The research has used a single cross-sectional design survey method, and future studies can consider employing a mixed method research model. The researcher's opinion correlates with the organisational performance in terms of present technology feasibility, competitive advantage, and relationship with the supply chain partners from the perspective of blockchain implementation. The research has only used managerial and innovation capabilities. Future research can consider employing other capability dimensions, such as the adaptive, absorptive, relational, operational, and strategic capabilities to understand the model more comprehensively. The study approached retailers with preliminary knowledge about blockchain across five to six industries. Also, most companies had less than 200 employees representing small and medium enterprises. Future research can investigate retailers across various industries and use the level of blockchain complexity as a moderator in the model. Also, future studies can increase the scope of this model by investigating the resistance pattern among large-scale organisations equipped with more resources and affordability to highlight how the results may differ. Primarily, it is essential to investigate the blockchain adoption or resistance from the preview of smart contracts, private vs public blockchain networks, smart contractual terms, and the financial flow in the supply chain. Besides retailing, the applications of

Table A1
Table showing the measurement scales (All scales are measured from 7 to 1).

Constructs	Items	Source
Inertia	I will continue with my existing centralised database because it would be stressful to change to blockchain ecosystem in the organisation. (A) I will continue with my existing centralised database because I am more comfortable doing so than changing to blockchain ecosystem in the organisation. (A) I will continue with my existing centralised database because I enjoy doing so than changing to blockchain ecosystem in the organisation. (A) I will continue with my existing centralised database simply because it is what I have always done in the organisation. (B) I will continue with my existing centralised database simply because it is part of my normal routine in the organisation. (B) I will continue with my existing centralised database simply because I've done so regularly in the past in the organisation. (B) I will continue with my existing centralised database even though I know it is not the best way of doing things in the organisation. (C) I will continue with my existing centralised database even though I know it is not the most efficient way of doing things in the organisation. (C) I will continue with my existing centralised database even though I know it is not the most effective way to do things in the organisation. (C)	Polites and Karahanna, (2012); Raddatz et al. (2021)
Switching Cost	I have already invested a significant amount of time and effort mastering the current way of working in the organisation. It would take a lot of time and effort for me to switch to the blockchain way of operations in the organisation. Integrating blockchain in our present information and transaction processing could result in unexpected additional work or effort in the organisation.	Polites and Karahanna, (2012); Balakrishnan et al. (2021)
Threat of data ownership	I am concerned that our personal and transactional information stored in the existing centralised database could be misused in blockchain ecosystem in the organisation. I am concerned about storing my organisation's descriptive and transactional information in existing centralised	Dinev and Hart, (2006); Raddatz et al. (2021)

(continued on next page)

Table A1 (*continued*)

Constructs	Items	Source
	database, because of what others might do with it in blockchain ecosystem.	
	I am concerned that the ownership/access to data in a public or private blockchain, can provide complete private information about my organisation.	
	I am concerned about storing organisation's descriptive and transactional information on my existing centralised database, because the ownership/access could be misused in a way that I did not foresee.	
Threat severity	If my organisation's database is accessed by unauthorised entities in blockchain ecosystem, it would be significant.	Johnston and Warkentin (2010); Raddatz et al. (2021)
	If my organisation's database is accessed by unauthorised entities in blockchain ecosystem, it would be severe.	
	If my organisation's database is accessed by unauthorised entities in blockchain ecosystem, it would be serious.	
	If my organisation's database is compromised in blockchain ecosystem, it would be serious.	
Threat Susceptibility	It is possible that my organisation's database in blockchain ecosystem will be accessed by unauthorised entities.	Johnston and Warkentin (2010); Raddatz et al. (2021)
	My organisation's database in blockchain ecosystem is at risk of being accessed by unauthorised entities.	
	My organisation's database in blockchain ecosystem is vulnerable to unauthorised access.	
Managerial capability in technology implementation	We have the ability to plan and implement new technologies like blockchain in our organisation setup.	Park et al. (2021)
	We have technical competence for planning and development of new technologies like blockchain in our organisation setup.	
	We have the ability to manage processes of new technologies like blockchain in our organisation setup.	
Innovation capability in technology implementation	We encourage members of the organisation to think creatively to promote new technologies such as blockchain.	Park et al. (2021)
	We provide administrative support at all levels to facilitate technology innovations such as blockchain in our organisation.	
	We provide all possible resources to promote technology innovation such as blockchain in our organisation.	
Resistance towards Blockchain adoption	I would oppose changing some of the systems I currently use in our organisation, for blockchain-based systems	Kim and Kankanhalli (2009), Walsh et al. (2021)
	I do not agree with changing some of the systems I currently use in our organisation, for blockchain-based systems	
	I would not cooperate with changing some of the systems I currently use in our organisation, for blockchain-based systems	
	I would not comply with changing some of the systems I currently use in our organisation, for blockchain-based systems	
Blockchain awareness	We possess high degree of expertise knowledge in Blockchain technology	Soto-Acosta et al. (2018)
	We are very knowledgeable about the contracts and operational features of blockchain technology	
	Our organisation possesses a high degree of expertise for the development and maintenance of blockchain technology	

(A) denotes affective inertia; (B) denotes behavioural inertia; (C) denotes cognitive inertia.

blockchain in marketing is huge, future research can focus on exploring the role of blockchain in advertising markets (Joo et al., 2022), use of NFTs in pricing scenario (Zhang 2022), and on how blockchain can help in sustainable solutions (Dwivedi et al., 2022c).

CRediT authorship contribution statement

Yogesh K. Dwivedi: Writing – review & editing, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Janarthanan Balakrishnan:** Writing – original draft, Visualization, Validation, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Ronnie Das:** Writing – review & editing, Visualization, Validation, Supervision, Resources, Formal analysis, Conceptualization. **Vincent Dutot:** Writing – original draft, Visualization, Supervision, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A

See Table A1.

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