The Role of Knowledge Management and Knowledge Capabilities in Driving Innovation and Business Performance in e-Commerce SMEs

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Abstract: Small and medium-sized businesses (SMEs), especially those in the e-commerce industry, are finding it more challenging to use intangible assets to support innovation and commercial performance in the knowledge-based digital economy. Few studies have thoroughly investigated how various aspects of knowledge capability collectively impact business performance through innovation capability, particularly in the context of emerging economies like Vietnam, despite the substantial body of literature on knowledge management (KM) and innovation. By integrating five essential knowledge factors—knowledge management, knowledge absorptive capability, knowledge application, knowledge transformation, and knowledge sharing—and evaluating their effects on innovation capability and business performance, this study seeks to close this gap. A quantitative research strategy was used to accomplish this goal. Using a standardized questionnaire with validated scales, 567 SMEs in the Vietnamese e-commerce industry were surveyed to collect primary data. To test the hypotheses and assess the structural links between the constructs, the data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that all five knowledge-related elements have a beneficial impact on corporate performance and innovation capability. Interestingly, knowledge transformation had the most significant influence on innovation potential, while knowledge management had the most significant direct impact on company performance. The association between knowledge components and business results was also found to be somewhat mediated by innovation capability, underscoring its function as a dynamic capability that transforms knowledge into concrete value. The theoretical presumptions of the Knowledge-Based View (KBV), the Resource-Based View (RBV), and the Dynamic Capabilities theory are all supported by these findings. The results show how knowledge management and knowledge capabilities can be used to boost innovation and enhance business performance in the digital economy, with practical implications for SME managers, legislators, and other stakeholders.

Keywords: Knowledge management, Innovation capability, Business performance, E-Commerce SMEs, Absorptive capacity, Dynamic capabilities

1. Introduction

In today's fast-evolving digital economy, knowledge has become one of the most valuable assets for organizations seeking to sustain competitiveness and achieve superior performance. Small and medium-sized enterprises (SMEs), particularly those operating in the e-commerce sector, are facing increasing pressure to innovate and adapt quickly to rapid technological advances and shifting consumer behavior. In this context, effective knowledge management (KM) is not merely a support function but a strategic imperative that enables organizations to harness, apply, and transform knowledge into value-creating innovation.

In modern organizations, knowledge serves as a fundamental basis for competitive advantage (Zack, 1999), while information technology is considered an essential enabler for effective knowledge management (Bose, 2016). In today's dynamic environment, two critical factors determine an organization's survival and long-term success: e-commerce and customer knowledge. These elements drive e-commerce adoption and promote the use of the Internet as a platform for accessing and gathering valuable customer insights. In other words, the success of e-commerce increasingly depends on how well organizations manage their knowledge resources (Borges et al., 2007; Saeed, Grover & Hwang, 2005).

Knowledge Management (KM) has emerged as a strategic tool that enables organizations to enhance organizational learning capabilities, improve operational efficiency, and lay the foundation for innovation. In the context of e-commerce—an environment characterized by rapid change and intense competition—the ability

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to effectively acquire, store, share, and apply knowledge, both internally and externally, is critical for organizational adaptation, growth, and long-term sustainability. By making data and information accessible and visible to organizational members when needed, effective KM can help create new sources of competitive advantage.

While a growing body of research has explored the relationship between KM and organizational outcomes, there remains a limited understanding of how the distinct dimensions of KM individually influence those outcomes. Previous studies often treat KM as a unidimensional construct by aggregating all its dimensions into a single variable, thereby limiting the ability to assess the specific impact of each KM component (Koohang, Paliszkiewicz

& Goluchowski, 2017; Bamel & Bamel, 2018). In the digital era, where data and information have become strategic assets, KM plays a pivotal role in sustaining and enhancing business competitiveness—particularly in the fast-paced, constantly evolving landscape of e-commerce. E-commerce is not merely a shift to digital transactions; it requires organizations to skillfully collect, store, analyze, and creatively apply knowledge to generate superior value.

According to Damiyana et al. (2024), e-commerce cannot reach its full potential without a strong KM foundation. While the adoption of e-commerce allows businesses to access information more quickly and interact with customers more efficiently, turning that information into actionable knowledge for strategic decision-making demands an appropriate KM system. This is especially vital for small and medium-sized enterprises (SMEs), which often face resource, financial, and human capital constraints. KM enables these firms to leverage both internal and external knowledge to compensate for these limitations.

For instance, according to the Vietnam E-commerce Association (VECOM, 2023), over 40% of SMEs in the e-commerce sector struggle to sustain growth due to limited knowledge management practices and weak innovation capability. A recent World Bank report (2022) also highlighted that SMEs in emerging markets often cannot absorb and apply external knowledge, hindering their competitiveness in the digital economy. These examples underscore the importance of understanding how knowledge factors and innovation capability shape the performance of e-commerce SMEs in Vietnam.

In the e-commerce environment, knowledge exists not only in structured formats like documents and databases but also in experiential know-how, customer feedback, digital platform interactions, consumer behavior data, and emerging technological trends. Effectively managing these knowledge flows allows SMEs to strengthen innovation capabilities, improve product development, optimize operations, and ultimately enhance customer experience. In this sense, KM serves as a strategic bridge between technology and business objectives—empowering firms not only to use e-commerce but to thrive in it.

Furthermore, the COVID-19 pandemic accelerated digital transformation across all sectors, compelling SMEs to adapt swiftly in order to survive. Those enterprises equipped with robust KM systems—able to harness knowledge to refine workflows, develop digital sales channels, and manage risks flexibly—demonstrated greater resilience and sustainability than their less-prepared counterparts. Thus, KM has evolved from a supportive function into a core component of digital business models.

The study by Damiyana et al. (2024) also highlights that KM not only directly impacts the sustainability of micro, small, and medium enterprises (MSMEs) but also serves as a crucial mediating factor linking innovation and performance to long-term development. These findings send an important message to business leaders and policymakers alike: in order for e-commerce to truly catalyze digital economic growth, it is essential to prioritize the development of KM capabilities, particularly among MSMEs.

This study contributes to the existing literature in several novel ways. First, it focuses on e-commerce SMEs in Vietnam, an emerging economy where empirical evidence on knowledge management and innovation remains limited. Second, unlike many prior studies that adopt a single theoretical lens, this research integrates the Resource-Based View (RBV), Knowledge-Based View (KBV), and Dynamic Capabilities theory into a unified framework. Third, the study employs PLS-SEM with a large sample of 567 SMEs, yielding statistically robust results in an underexplored context. Collectively, these aspects enhance the research's novelty and provide valuable insights for both theory and practice.

In line with the research objectives and the identified gaps in the literature, this study seeks to address the following research questions:

RQ1: How does knowledge management influence innovation capability and business performance in e-commerce SMEs?

RQ2: What roles do knowledge absorptive capacity, knowledge transformation, knowledge application, and knowledge sharing play in shaping innovation capability and business performance?

RQ3: To what extent does innovation capability mediate the relationship between knowledge-related factors and business performance in e-commerce SMEs?

2. Literature Review

2.1 Concept

2.1.1 Knowledge management

Scholars have conceptualized "knowledge capability" in multiple, complementary ways. Early work emphasized knowledge as an organizational process—concerned with activities for creating, storing, sharing, and applying knowledge (Davenport & Prusak, 1998; Wiig, 1997). Another strand framed knowledge as a strategic resource that underpins competitive advantage (Resource-Based View) and therefore called for capabilities to manage and exploit knowledge assets (Grant & Phene, 2021). A third, more dynamic perspective emphasizes the firm's capacity to sense, seize, and reconfigure knowledge in changing environments (Zahra, Petricevic & Luo, 2022). Together, these approaches suggest that knowledge capability is multi-dimensional—encompassing structures and systems (architecture), processes (absorptive, transformation, application), and relational practices (sharing, governance) that convert information into strategic outcomes. Building on these traditions, many empirical studies adopt multi-factor constructs to operationalize knowledge capability. Common dimensions found across prior work include: (1) mechanisms for knowledge governance and management, (2) absorptive capacities, (3) mechanisms for knowledge transformation/integration, (4) the ability to apply knowledge in operational and innovation processes, and (5) practices for sharing and dissemination. The five-factor framework used in this study synthesizes these strands and captures both the static (resources, systems) and dynamic (learning, transformation, application) facets of organizational knowledge capability.

Knowledge is widely recognized as a fundamental element in society, representing an individual's perception and understanding of reality (Nonaka, 1994). It stems from personal experiences and educational backgrounds, and is inherently internalized within an individual's mind (Harrington, Srai & Kumar, 2019). From an academic standpoint, knowledge management refers to the systematic approach through which organizations acquire, disseminate, utilize, and retain knowledge, ultimately fostering the creation of new knowledge and competencies that support ongoing innovation (Weerasinghe & Sedera, 2023). Consequently, knowledge management involves multifaceted processes and components. Kiessling et al. (2009) emphasize that a business's sustained success is significantly influenced by its knowledge management practices. In both public and private sectors, knowledge management is regarded as essential for boosting organizational efficiency and adaptability (Mårtensson, 2000). Furthermore, it plays a critical role in driving organizational growth, as firms must not only possess valuable knowledge resources but also ensure their uniqueness and the capacity to renew dynamic capabilities (Koshelieva et al., 2023). According to Gurteen (1998), knowledge management encompasses a strategic framework of processes, structures, technologies, and tools designed to support knowledge workers in enhancing their competencies, fostering innovation, and contributing greater business value.

Knowledge absorptive capacity (KAC). Absorptive capacity denotes the ability to identify, assimilate, and apply external knowledge—critical for learning from partners, customers, and markets (Chichkanov, 2020). Studies show that higher absorptive capacity enhances firms' innovation outcomes by enabling effective exploitation of external knowledge flows (Khraishi et al., 2022).

Knowledge transformation (KT). Transformation involves converting knowledge forms, integrating new knowledge with existing knowledge bases, and reconfiguring routines to embed learning (Mele et al., 2023). This capability is closely linked to organizational adaptation and the generation of novel ideas that can be operationalized into innovation (González-Ramos, Guadamillas & Donate, 2022).

Knowledge application (KA). Application is the capability to put knowledge into practice—improving decisions, processes, products, and services (Rajagopal et al., 2022). Many scholars stress that knowledge only yields economic value when it is applied effectively; thus, application capability links intellectual assets to tangible performance gains (Ali et al., 2021; De Matos Pedro, Alves & Leitão, 2020).

Knowledge sharing (KS). Sharing covers the dissemination and exchange of knowledge across individuals, teams, and organizational boundaries. Practices such as communities of practice, training, and inter-unit interaction

accelerate innovation and reduce duplication of effort (Awada & Youssef, 2024). Knowledge sharing also strengthens absorptive and transformative processes by widening the firm's knowledge base.

Together, these five dimensions capture complementary aspects of organizational knowledge capability: KM provides the enabling architecture; absorptive capacity brings in external inputs; sharing expands and diffuses knowledge; transformation reorganizes and integrates knowledge; and application converts knowledge into innovations and performance. Empirically measuring these interrelated capabilities allows the present study to examine not only direct effects on innovation and performance, but also the mechanisms (e.g., mediation by innovation capability) through which knowledge is translated into firm outcomes.

While the five knowledge-related factors share conceptual linkages, they are theoretically and empirically distinct. Knowledge Management (KM) provides the overarching architecture and governance systems that support all other knowledge processes. In contrast, Knowledge Sharing (KS) specifically refers to the relational practices of disseminating knowledge across individuals and units. Similarly, Knowledge Absorptive Capacity (KAC) emphasizes the ability to recognize and assimilate external knowledge, which differs from Knowledge Transformation (KT)—the internal process of reconfiguring and integrating knowledge into existing routines. Knowledge Application (KA) represents the final stage, whereby accumulated and transformed knowledge is put into practice to create value.

Despite these distinctions, potential overlaps and synergies among the factors cannot be ignored. For instance, effective KM systems often facilitate KS, and high absorptive capacity may enhance transformation and application processes. Such complementarities suggest that interaction effects may exist, in which the combined presence of two or more knowledge capabilities strengthens their overall impact on innovation and business performance. Although the present study focuses on direct and mediating relationships, future research should explore possible interaction effects using advanced analytical techniques, as these may yield additional insights into how different knowledge processes jointly drive organizational outcomes.

2.1.2 Business performance

Business performance is literally defined as a measure of how well a company implements its strategies and achieves its objectives (Lau et al., 2022). Business performance is commonly evaluated using key performance indicators (KPIs) tailored to an organization's specific goals and industry standards (Van De Ven et al., 2023). High levels of business performance are often associated with profitability, growth, competitive advantage, and sustainability. By focusing on continuous improvement and aligning strategies with objectives, organizations can enhance performance and position themselves for long-term success (Yasir & Majid, 2017). Understanding and applying these elements can drive growth and development for SMEs in the broader economic and business context, thereby improving their performance (Wang & Yang, 2016).

2.1.3 Innovation capability

Innovation has long been recognized as a critical factor for gaining a competitive edge (Drucker, 1985; Kafetzopoulos, Gotzamani & Gkana, 2015). Kuhn and Marisck (2010) define innovation as the conversion of ideas or discoveries into valuable products or services that effectively address and fulfill customer needs and expectations. In a similar vein, Crossan and Apaydin (2010) characterize innovation as the generation, adaptation, and implementation of novelty and added value in business and production. This process includes enhancing and diversifying products, services, and markets, as well as developing new production methods and management systems. The importance of innovation in shaping both economic and social systems has intensified to the extent that some scholars view the contemporary economy as being fundamentally innovation-driven (Zhou, Mavondo & Saunders, 2019; Aujirpongpan & Hareebin, 2020). According to Acosta, Popa & Martinez-Conesa (2018), innovation refers to the degree to which organizations introduce new or improved products and services to the market. This encompasses novel products, ideas, technologies, institutions, behaviors, values, and practices—in essence, innovation represents either the refinement or the invention of ideas aimed at continuous advancement to meet evolving customer expectations (Sanchez-Famoso et al., 2019). For innovation to be sustained, leaders must pay attention not only to technologies, products, and processes but also to the organizational culture, norms, and underlying values that shape company behavior (Srisathan, Ketkaew & Naruetharadhol, 2020; Muafi, 2020).

2.1.4 E-Commerce

E-commerce refers to the advancement of buying and selling activities facilitated through digital platforms and internet-based technologies (Chamorro et al., 2019). Essentially, it allows consumers to engage in online

shopping with greater convenience, speed, and flexibility—anytime, anywhere—as long as they are connected to the internet, setting it apart from traditional retail methods. According to the World Trade Organization (WTO, 1998), e-commerce encompasses "the production, distribution, marketing, sale or delivery of goods and services by electronic means." Over time, e-commerce has undergone significant development, accompanied by a growing number of users exchanging electronic documents, both within organizational settings and among individual consumers.

2.1.5 SMEs

Small and medium-sized enterprises (SMEs) play a critical role in most economies by driving innovation, creating employment, and contributing to GDP (Storey, 2016). Unlike large firms, SMEs are typically characterized by limited resources, less formalized structures, and a strong reliance on flexibility and entrepreneurial decision-making (Freel, 2000). These characteristics mean that SMEs often face significant challenges in developing and sustaining competitive advantage, especially in dynamic, knowledge-intensive environments. Knowledge management in SMEs tends to be more informal and people-oriented compared to the codified, IT-driven systems found in larger firms (Scuotto et al., 2017). For example, SMEs often rely on direct communication, mentoring, and day-to-day interactions to transfer and integrate knowledge across teams (Durst & Edvardsson, 2012). At the same time, their agility and flatter organizational structures allow them to transform and apply knowledge more quickly, enabling rapid responses to changing market conditions (Shaikh, 2024). Focusing on e-commerce SMEs is especially relevant. Operating in highly dynamic, digitally mediated markets, these firms are continuously exposed to external knowledge flows from customers, platforms, and competitors. They must therefore develop strong knowledge-related capabilities to capture, share, and apply knowledge effectively in order to innovate and remain competitive (Damiyana et al., 2024). In emerging economies such as Vietnam, where SMEs dominate the business landscape and digital adoption is accelerating, understanding how knowledge factors drive innovation and performance provides valuable insights for both theory and practice.

2.2 Theoretical Foundation

2.2.1 The resource-based view – RBV

The Resource-Based View (RBV) is one of the foundational theories in strategic management, focusing on internal resources to explain differences in performance and competitive advantage among organizations (Barney, 1991; Wernerfelt, 1984). Rather than emphasizing external factors such as industry or market conditions, RBV highlights the critical role of a firm's unique resources and capabilities. Penrose (1959) was the first to conceptualize this view by proposing that a firm is essentially a collection of resources managed and combined through human knowledge and capabilities. These resources include physical assets (e.g., machinery and equipment), human assets (e.g., skills and experience), and organizational assets (e.g., corporate culture, processes, and organizational knowledge). Among them, knowledge—especially tacit knowledge—has increasingly been recognized as a valuable, rare, and difficult-to-imitate strategic resource (Bontis, 1998; Curado & Bontis, 2006).

According to Barney (1991), in order for a resource to generate sustainable competitive advantage, it must satisfy four criteria: (1) Value, (2) Rarity, (3) Inimitability, and (4) Non-substitutability, known collectively as the VRIN framework. Intangible resources such as organizational culture, innovation capability, or specialized knowledge often possess these characteristics, thereby enabling firms to maintain superior long-term performance (Peteraf, 1993). However, traditional RBV emphasizes the possession of resources. Teece, Pisano & Shuen (1997) extended the theory with the concept of dynamic capabilities, which refer to an organization's ability to integrate, coordinate, and reconfigure resources in response to changing environments. Especially in today's knowledge-based economy, the management, transformation, and flexible application of knowledge are key factors in maintaining sustainable competitive advantage (Grant, 1996).

2.2.2 Knowledge-based view – KBV

The Knowledge-Based View (KBV) is an extension and deeper development of the Resource-Based View (RBV), emphasizing that knowledge is the most important strategic resource of a firm in the modern business environment (Grant, 1996; Curado & Bontis, 2006). While RBV considers resources—both tangible and intangible—as the basis for competitive advantage, KBV specifically highlights knowledge as the core factor that provides differentiation and sustainability. According to KBV, a firm is not merely a production entity but a "learning entity"—where knowledge is created, retained, transferred, and applied to generate value (Nonaka & Takeuchi, 1995; Curado & Bontis, 2006). Knowledge within organizations exists in various forms: explicit and

tacit knowledge, the latter being difficult to share or replicate and thus serving as the foundation for sustainable competitive advantage (Winter, 2003; Szulanski, 2003).

Unlike traditional resources that may be depleted when used, knowledge increases in value the more it is utilized and can be applied across various contexts without diminishing its intrinsic worth (Spender, 2002). Additionally, KBV acknowledges the critical role of social and cultural factors in knowledge sharing and development—this underpins innovation capabilities and strategic adaptability. Curado and Bontis (2006) propose that value creation in KBV depends on an organization's ability to: (1) accumulate knowledge (through learning and acquiring new knowledge), (2) integrate knowledge (by combining individual and organizational knowledge), and (3) apply knowledge in practice to generate innovation and performance.

2.2.3 Dynamic capabilities theory

The Dynamic Capabilities Theory is regarded as a significant extension of the Resource-Based View (RBV), especially in the context of continuously changing business environments. While RBV focuses on the possession of valuable, rare, inimitable, and non-substitutable (VRIN) resources to achieve sustainable competitive advantage (Barney, 1991; Eisenhardt & Martin, 2000), the Dynamic Capabilities theory emphasizes a firm's ability to continuously restructure, integrate, and renew its existing resources to adapt to environmental changes (Teece, Pisano & Shuen, 1997). Accordingly, dynamic capabilities are defined as "a firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments." The six key components of dynamic capabilities include sensing, seizing, reconfiguring, absorptive capacity, connectivity, and integration—enabling firms to generate more flexible and sustainable competitive advantages in uncertain environments.

2.2.4 Absorptive capacity theory

The Theory of Absorptive Capacity was first introduced by Cohen & Levinthal (1990) and has since been further developed by numerous scholars both theoretically and empirically. Absorptive capacity is defined as a firm's ability to recognize, assimilate, and apply new knowledge to generate commercial value.

Cohen and Levinthal (1990) initially argued that absorptive capacity is a byproduct of efforts in innovation and problem-solving within a learning organization. This organizational capability is influenced by the absorptive capacity of individual employees (Minbaeva et al., 2003) and the diversity of expertise within the organization (Cohen & Levinthal, 1990) and tends to improve in environments that support knowledge sharing and effective internal communication (Chalos & O'Connor, 2004). An individual's absorptive capacity is affected by their prior related knowledge and the level of personal effort exerted (Cohen & Levinthal, 1990).

Previous studies have identified several factors influencing the absorptive capacity of local partners, such as trust, cultural similarity, industry relevance, technical and managerial support, and joint venture goals (Lane, Salk & Lyles, 2001), as well as learning orientation and the possession of relevant knowledge (Park & Choi, 2014). In this study, "knowledge absorptive capacity" is included as one of the variables in the research model—directly derived from this theory. The theory complements the dynamic capabilities framework, emphasizing the importance of learning from external sources as a critical condition for innovation and firm performance.

2.3 Development of Hypothesis

2.3.1 Knowledge management (KM)

In today's highly competitive markets, innovation has become an essential element for organizational survival and long-term growth (Hurley & Hult, 1998). The capacity for innovation within organizations is deeply linked to how well they generate and utilize their internal knowledge resources. In particular, knowledge management plays a critical role in driving and sustaining innovation (Duan, 2017). A qualitative investigation by Ibarra et al. (2020) conducted with 78 small and medium-sized enterprises (SMEs) in Spain revealed that the flow of information regarding both market demands and technological capabilities—along with collaborative networks involving customers and partners—is a key enabler of innovation within firms. Hence, efficient knowledge management systems are essential for enhancing a company's competitive position, strengthening customer orientation, improving relationships and employee capabilities, boosting innovation, and lowering operational costs. Numerous researchers have stressed that adopting knowledge management practices significantly contributes to innovation (Ibarra et al., 2020; Al-Mamoori & Ahmad, 2015). By developing and applying knowledge-sharing infrastructures, organizations are encouraged to move beyond traditional mindsets about intellectual property and work culture, embracing new processes and disciplines that promote organizational change and innovation.

Knowledge management is widely regarded as a strategic tool for enhancing competitiveness (Audretsch & Thurik, 2004), since knowledge itself is a key resource that enables firms to achieve greater innovation and performance outcomes (Chirico, 2008). Supporting this, Barney (2007) argues that effectively managed knowledge leads to better organizational performance. Activities such as acquiring, generating, sharing, storing, and applying knowledge are fundamental for attaining high performance (Soderberg & Holden, 2002). Therefore, firms aiming to stay ahead in the market must invest in the strategic management of knowledge assets to drive profitability, sales growth, and market expansion. Empirical studies have consistently found a positive connection between knowledge management and firm performance. For instance, Wang and Lin (2013) demonstrated that a strong orientation toward knowledge management enhances organizational performance in Chinese firms. Likewise, Noruzy et al. (2013) identified a positive impact of knowledge management on the performance of manufacturing enterprises. Roland (2006) further emphasized that organizations striving for sustained high performance must develop robust systems for knowledge generation, transfer, and integration.

Based on the above discussions, the study proposes the following hypotheses:

H1: Knowledge management positively affects innovation capability.

H2: Knowledge management positively affects the business performance of SMEs in the e-commerce sector.

2.3.2 Knowledge absorptive capacity (KAC)

A well-developed knowledge base often serves as the foundation for business innovation, which is understood as a continuous process of accumulating and integrating knowledge from diverse sources. As such, the breadth and depth of a firm's knowledge base are closely linked to its level of innovation performance (Zhou & Li, 2012). Absorptive capacity—a firm's ability to recognize, assimilate, and apply external knowledge—plays a pivotal role in influencing innovation outcomes through key elements such as information technology, organizational culture, and structural design. Information technology, in particular, facilitates knowledge transfer by enabling both formal and informal communication channels, thereby encouraging knowledge exchange across different departments and functions, and ultimately increasing the occurrence of innovative activities (Scuotto et al., 2017; Trantopoulos et al., 2017). Furthermore, an organizational culture that fosters innovation can enhance employees' motivation and creative engagement by cultivating an environment that supports experimentation and new ideas (George, McGahan & Prabhu, 2012). In parallel, a flexible and adaptive organizational structure enables businesses to realign internal operations in response to external changes, thereby reducing lag time and supporting faster innovation (Vendrell-Herrero, Bustinza & Opazo-Basaez, 2021). Altogether, absorptive capacity enables more effective organizational learning and product development, thereby boosting the frequency, depth, and speed of innovative efforts.

Several studies have found that absorptive capacity significantly contributes to business performance. Najafi-Tavani et al. (2018) explored the importance of product and process innovation capabilities as independent mechanisms through which cooperative ecosystems enhance new product success, finding that innovation networks significantly impact innovation capabilities only when absorptive capacity is present. Considering technology firms from an organizational learning perspective, Garcìa-Morales, Ruiz-Moreno & Llorens-Montes (2007) found that absorptive capacity positively influences both learning and creativity, and that increasing absorptive capacity within an organization motivates individuals to pursue and understand new ideas; thus, organizational learning and innovation improve business performance. Similarly, Gebauer, Worch & Truffer (2011) demonstrated that knowledge transfer between exploration and exploitation learning processes significantly impacts business performance when absorptive capacity is stronger. Liu, Dutta & Park (2020) also revealed how companies can focus on labor productivity by leveraging absorptive capacity to achieve high performance.

Based on the above discussions, the following hypotheses are proposed:

H3: Knowledge Absorptive capacity positively affects innovation capability.

H4: Knowledge Absorptive capacity positively affects the business performance of SMEs in the e-commerce sector.

2.3.3 Knowledge transformation (KT)

Knowledge is increasingly viewed as a strategic asset that facilitates the transmission of information about market needs and trends, which can then be incorporated into new organizational routines, products, or

processes to address the demands of dynamic markets (Vasconcelos et al., 2018). As a key element of organizational learning, knowledge transformation is the process of converting novel ideas, data, or behaviors into forms that firms can internalize and utilize (Yew, 2021). However, establishing effective transformation mechanisms presents a significant challenge, as firms must carefully distinguish between existing knowledge and newly acquired insights that require validation, integration, or rejection (Muñoz et al., 2022). This process of embedding new knowledge into organizational frameworks is essential for driving enhanced business performance (Cruz-Ros, Guerrero-Sánchez & Miquel-Romero, 2018).

For innovation to take place, organizations must possess the necessary innovation capabilities (Laforet, 2011). Innovation is typically categorized into product/service innovation—what the firm delivers—and process innovation—how those offerings are created and delivered, especially within the context of sustainability (Adams et al., 2015). Firms that introduce highly novel offerings often rely on diverse knowledge inputs during the development phase and are more likely to learn through the innovation process itself (Rhaiem & Amara, 2019). Collaboration with external partners plays a critical role in this, as firms with strong alliances tend to develop more robust innovation capabilities that contribute to improved outcomes (Mention, 2010). High levels of collaborative innovation facilitate direct engagement between the focal firm and external stakeholders, thereby enhancing the flow of strategic resources essential for innovation (Ireland & Webb, 2006). Engaging with outside actors enables organizations to broaden their resource base and accelerate the development of new products and services.

Transforming knowledge remains a complex endeavor, as it demands continuous evaluation of what knowledge should be retained, tested, or discarded (Muñoz et al., 2022). The significance of this process has been demonstrated across various industries, including tourism. For example, Batra et al. (2021) highlight how knowledge transformation drives improved performance in tourism settings. Likewise, Liu and Dong (2021) note that it fosters innovation, enhances service quality, reduces operational costs, and ultimately boosts profitability. Successfully converting individual knowledge into organizational knowledge requires robust knowledge management practices (Liebowitz, 2001), especially amid ongoing technological advances that have transformed how knowledge is digitized and managed, opening new avenues for virtual collaboration and e-commerce (Tiago et al., 2007).

Based on the above arguments, the following hypotheses are proposed:

H5: Knowledge transformation positively affects innovation capability.

H6: Knowledge transformation positively affects the business performance of SMEs in the e-commerce sector.

2.3.4 Knowledge application (KA)

Knowledge application refers to an organization's capacity to leverage accumulated knowledge to drive innovation efforts (Ha et al., 2021). It enhances innovation performance by effectively deploying relevant knowledge across different innovation types, particularly in the development of new products and technologies. Given that knowledge application is inherently a process of transforming intellectual capital into tangible innovative outcomes, firms must strategically manage this capability. Specifically, they need the competence to assess external opportunities and threats arising from environmental shifts, while simultaneously leveraging internal knowledge assets to support innovation. Moreover, the integration and transformation of knowledge across various units and external partners are essential components of successful knowledge application. This integration process fosters a steady flow of innovative ideas and strengthens the organization's ability to capitalize on emerging opportunities (Shujahat et al., 2017). In essence, the application of knowledge is both a foundational requirement for achieving organizational objectives and a critical driver of innovation effectiveness. Knowledge that has been absorbed and transformed through prior processes becomes economically valuable only when applied in real-world business contexts. By doing so, organizations can not only unlock new avenues for innovation but also enhance the likelihood of commercializing knowledge-based outputs.

Applying knowledge enables businesses to respond more quickly to changing business conditions by integrating knowledge into new products or processes (Gold, Malhotra & Segars, 2001). According to Alavi and Leidner (2001), knowledge application is the most important management process to improve organizational performance. Zaim, Muhammed & Tarim (2018) argue that knowledge application has the greatest impact on business performance. Moreover, knowledge application plays a vital role in enhancing operational processes and driving better decisions, all contributing to improved business performance (Loke et al., 2020; Xie, Zou & Qi,

2018). According to Serrasqueiro et al. (2010), R&D activities can significantly contribute to the development of small and medium enterprises.

Based on the above arguments, the author proposes the following hypotheses:

H7: Knowledge application positively affects innovation capability.

H8: Knowledge application positively impacts the business performance of SMEs in the e-commerce sector.

2.3.5 Knowledge sharing (KS)

Studies show a positive relationship between knowledge sharing and innovation. Knowledge sharing contributes to improving innovation speed and quality, as well as overall company performance (Doğan & Doğan, 2020; Fern, Ashraf & Batool, 2022). The relationship between knowledge sharing and innovation is particularly important in high-tech industries and manufacturing sectors, where rapid technological changes and fierce competition require continuous innovation (Fern, Ashraf & Batool, 2022). Therefore, it is important to implement knowledge-sharing activities to improve innovation and overall company performance. Wang & Wang (2012) and Wang, Sharma & Cao (2016) indicated that knowledge sharing facilitates better flow of information and resources within organizations, leading to measurable increases in performance. Knowledge sharing clearly involves codified knowledge such as documents and manuals, which can improve innovation speed and financial performance (Wang & Wang, 2012). Knowledge sharing is an essential part of open innovation strategies. In inbound open innovation, knowledge sharing and innovation strategies fully mediate the relationship between open innovation efforts and performance, ensuring that these efforts lead to tangible outcomes (Bagherzadeh et al., 2020).

Knowledge sharing takes place through multiple channels, including training sessions, communication, observation, technology transfer, replication of routines, presentations, and interactions with both suppliers and customers, encompassing various types of relationships within and between organizations (Chua & Pan, 2006). This process has been shown to enhance the performance of manufacturing firms and their suppliers (Fugate et al., 2008). Additionally, effective knowledge sharing contributes to improved design outcomes by fostering new insights and enhancing capabilities (Chen & Huang, 2008). Consequently, performance improvement is considered crucial for manufacturing companies aiming to achieve their innovation goals (Cabrera & Cabrera, 2002). Numerous studies have confirmed the positive effects of knowledge sharing on organizational performance in the manufacturing sector (Law & Ngai, 2007). Indeed, this connection is often viewed as a fundamental prerequisite, enabling knowledge sharing to support and amplify other business activities and drive superior business results. Based on the above arguments, the author proposes the following hypotheses:

H9: Knowledge sharing positively affects innovation capability.

H10: Knowledge sharing positively impacts the business performance of SMEs in the e-commerce sector.

2.3.6 Innovation capability (IC)

In the face of growing competitive pressures, small and medium enterprises (SMEs) need to consistently evaluate their competitive standing by fostering sustainable innovation. Audretsch & Belitski identify that search by Agyapong, Agyapong & Poku (2017) indicates a positive correlation between innovation activities and the business performance of SMEs. Similarly, Bahta et al. (2020) highlight that SMEs' innovation capabilities significantly enhance productivity and operational efficiency. Exposito & Sanchis-llopis (2018) also found that innovation plays a crucial role in influencing the business effectiveness of SMEs in Spain. Maldonado-Guzmán et al. (2018) reported that innovations across product development, processes, marketing, and management have a positive and meaningful impact on the performance of SMEs. Moreover, empirical evidence from Arsawan et al. (2020) supports a positive link between innovation capabilities and SME business outcomes. From a theoretical standpoint, the dynamic capabilities framework stresses the strategic value of intangible assets as key drivers of firm performance (Teece, Pisano & Shuen, 2001). Based on this, the following hypothesis is proposed:

H11: Innovation capability positively impacts the business performance (BP) of SMEs in the e-commerce sector.

The research model presented in Figure 1 illustrates the relationship between knowledge factors, innovation capability, and business performance.

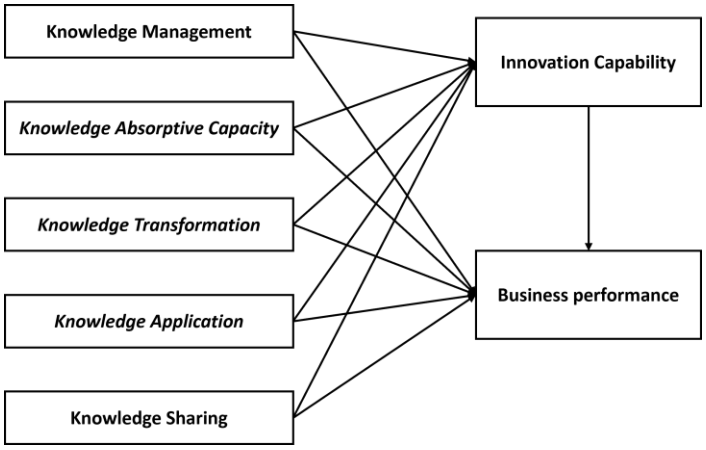

Figure 1: Proposed research model

3. Research Methodology

3.1 Qualitative Research Method

Based on the research objectives, the author develops the research model and hypotheses, identifies the observed variables and measurement scales for the research concepts, and evaluates and synthesizes results from previous related studies.

After completing the initial version of the measurement scales, the author conducted interviews with two English-proficient students to assess translation accuracy and ensure the scales were appropriate in terms of terminology.

Next, in-depth interviews were carried out with five lecturers specializing in Business Administration and E-commerce to verify the reliability of the measurement scales and the suitability of the proposed research model. The purpose of this study is to adjust the concepts in the measurement scales (possibly adding or removing factors, observed variables, and refining wording to suit the research context) through two rounds of discussions with five experienced experts:

Round 1: Discussion on factors in the proposed research model

Round 2: Discussion on observed variables in the measurement scales

3.2 Quantitative Research Method

This study is divided into two stages: preliminary quantitative research and official quantitative research.

3.2.1 Preliminary quantitative research

Preliminary quantitative research was conducted via a survey of 60 respondents from small and medium enterprises (SMEs). The goal was to evaluate the content and format of statements in the draft measurement scales to finalize the official scales used in the main study (evaluating form, wording, and grammar of statements to ensure consistency, clarity, and no confusion for respondents) and to assess the reliability of observed variables using a 5-point Likert scale (1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Strongly Agree), so that inappropriate variables could be removed and the official questionnaire could be finalized. This preliminary quantitative study aimed to evaluate the Cronbach's Alpha reliability coefficient. After the scales were finalized, they were used for the official quantitative study.

3.2.2 Official quantitative research

The official quantitative research was conducted via a survey targeting approximately 567 SMEs in Vietnam. The surveyed firms represent a variety of e-commerce-related industries, including retail (fashion, electronics, household goods), services (education, travel, logistics), and digital products (software, online platforms). This diversity ensures that the sample reflects the heterogeneity of Vietnam's e-commerce ecosystem. The growth rate of e-commerce in Vietnam reached 27% in 2024, with the online retail market size hitting USD 32 billion, strengthening the country's solid position in e-commerce. Building on this foundation, along with a series of policies and legal documents that came into effect or were issued in 2025, VECOM assessed that Vietnam's e-commerce is entering its fourth phase—a stage of rapid and sustainable development. At the same time,

Vietnamese small and medium-sized enterprises (SMEs) often face financial, technological, and human resource constraints, which hinder their ability to manage knowledge effectively and foster innovation. This makes Vietnam a highly relevant yet underexplored context for examining the role of knowledge and innovation in SME operations. Data collection was conducted in 2025, a year of strong recovery in the digital economy, providing a unique opportunity to observe how SMEs leverage knowledge capabilities to enhance innovation and business performance.

Business performance (BP) was measured using a validated multi-item scale adapted from Truong & Nguyen (2024). The scale includes both financial (e.g., profitability, sales growth) and non-financial (e.g., customer satisfaction, market share) dimensions. All items were rated on a five-point Likert scale. Descriptive analysis confirmed that the BP construct follows an approximately normal distribution, with skewness and kurtosis values falling within acceptable thresholds, ensuring suitability for PLS-SEM analysis.

After data collection, the author performed statistical aggregation of the survey data, reliability testing of each measurement scale component through Cronbach's Alpha, and hypothesis testing using Partial Least Squares Structural Equation Modeling (PLS-SEM).

3.3 Sampling Method and Sample Size

The study applied a non-probability convenience sampling method, targeting SMEs in the e-commerce sector in Ho Chi Minh City. The sample size was determined based on two factors, as outlined by Hair et al. (2006): a minimum of 50 samples and the number of variables included in the analysis. The formula is:

$$n = \sum_{j=1}^{m} kPj$$

Where:

- m is the number of measurement scales,
- P_j is the number of observed variables for scale jjj,
- The sample-to-variable ratio k is either 5:1 or 10:1.

In this research model, there are 7 factors and a total of 35 observed variables. Using k = 5: 1, the minimum sample size required is n = 35 × 5 = 175

Additionally, the author considered studies by Comrey & Lee (2013) and Tabachnick & Fidell (2007). According to Comery & Lee (2013), sample sizes of 100 are poor, 200 are acceptable, 300 are good, 500 are very good, and 1,000+ are excellent. Tabachnick & Fidell (2007) suggest that 300 observations are sufficient for SEM models, and 500 are very good. Therefore, to balance resource constraints and account for invalid responses, this study planned for an estimated sample size of 600 observations. This satisfies the minimum of 160 observations recommended by Hair et al. (2006) and is considered a very good sample size per Comrey & Lee (2013) and Tabachnick & Fidell (2007).

3.4 Secondary Data Collection

Secondary data were collected from reputable sources on knowledge management, e-commerce, business performance, and innovation capacity, both domestically and internationally. These data supported the importance of knowledge management in businesses today.

The study also reviewed foundational theories and previous research on knowledge management in books, academic journals, and scientific articles from databases such as ScienceDirect, Elsevier, Sage, Taylor & Francis, SpringerLink, Google Scholar, and Emerald Insight. Most sources were published on these platforms and have been peer-reviewed for scientific credibility.

3.5 Primary Data Collection

Primary data was collected in three steps:

Step 1: After qualitative research, the author developed a preliminary (draft) survey using a 5-point Likert scale (from 1 = Strongly Disagree to 5 = Strongly Agree).

Step 2: From the draft survey, 60 SMEs were selected to assess the scales' reliability and refine the questionnaire into the official form.

Step 3: The official questionnaire survey was conducted. The collected data were analyzed using SmartPLS 4.0.

4. Result

4.1 Descriptive Analysis

Table 1 provides a descriptive overview of the study sample, comprising 567 respondents. Regarding gender distribution, males accounted for 56.97% of participants, while females accounted for 43.03%. Regarding age, the majority of respondents were between 24 and 30 years old (41.62%), followed by those aged 30 to 36 years (21.69%) and over 42 years (17.28%), indicating that the sample primarily consists of individuals in their prime working years. Regarding educational attainment, a significant proportion of respondents held a university degree (82.01%), while 10.93% had completed college and 4.76% held postgraduate qualifications, reflecting a generally high level of education among participants. In terms of income, the most common range was 15-20 million VND per month (39.86%), suggesting a moderate to upper-middle income profile. Regarding company size, the majority of respondents worked in small enterprises (62.79%), followed by micro enterprises (19.75%) and medium-sized enterprises (17.46%). In terms of job position, technical specialists accounted for the highest proportion (43.56%), followed by sales managers (21.34%). Most respondents were employed in companies that had been operating for more than five years (53.79%), indicating a relatively stable business environment. Lastly, in terms of enterprise type, private enterprises accounted for the largest proportion (56.97%), followed by joint-stock or joint-venture enterprises (43.03%).

Table 1: Description of the study sample

Personal Information		Frequency	Percent (%)
Gender	Male	323	56.97
	Female	244	43.03
Age	From 18 to 24 years old	36	6.35
	From 24 to 30 years old	236	41.62
	From 30 to 36 years old	123	21.69
	From 36 to 42 years old	74	13.05
	Over 42 years old	98	17.28
Education Level	Lower secondary school	3	0.53
	Upper secondary school	10	1.76
	College	62	10.93
	University	465	82.01
	Postgraduate	27	4.76
Income Level	Under 10 million VND	68	11.99
	From 10 to 15 million VND	126	22.22
	From 15 to 20 million VND	226	39.86
	From 20 to 25 million VND	100	17.64
	Over 25 million VND	47	8.29
Company Size	Micro enterprise	112	19.75
	Small enterprise	356	62.79
	Medium enterprise	99	17.46
Job Position	Marketing Director	56	9.88
	Sales Director	78	13.76
	General Director	65	11.46
	Sales Manager	121	21.34
	Technical Specialist	247	43.56
Business Operating Time	Less than 5 years	262	46.21
	More than 5 years	305	53.79

Personal Information		Frequency	Percent (%)
Type of Enterprise	Private enterprise	323	56.97
	Joint stock – Joint venture enterprise	244	43.03

Table 2 presents the descriptive statistics for all measurement items. The mean values ranged from 3.69 to 4.22, indicating generally positive responses across constructs. Standard deviations ranged from 0.71 to 1.10, suggesting moderate variability in participants' evaluations.

Table 2: Descriptive statistics of survey items

Item	N	Mean	SD	Min	Max
KM1	567	3.79	1.01	1	5
KM2	567	3.70	1.10	1	5
KM3	567	3.76	1.01	1	5
KM4	567	3.75	0.99	1	5
KM5	567	3.80	0.96	1	5
KAC1	567	3.76	0.89	1	5
KAC2	567	3.81	0.79	1	5
KAC3	567	3.76	0.89	1	5
KAC4	567	3.79	0.85	1	5
KAC5	567	3.69	0.81	1	5
KT1	567	4.05	0.85	1	5
KT2	567	4.02	0.81	1	5
KT3	567	3.99	0.80	1	5
KT4	567	4.00	0.82	1	5
KT5	567	4.04	0.75	1	5
KA1	567	4.15	0.82	1	5
KA2	567	4.17	0.76	1	5
KA3	567	4.18	0.81	1	5
KA4	567	4.22	0.79	1	5
KA5	567	4.19	0.71	1	5
KS1	567	4.11	0.74	1	5
KS2	567	4.08	0.74	1	5
KS3	567	4.20	0.73	1	5
KS4	567	4.19	0.73	1	5
KS5	567	4.20	0.75	1	5
IC1	567	4.09	0.84	2	5
IC2	567	3.98	0.71	2	5
IC3	567	4.05	0.74	2	5
IC4	567	4.09	0.84	2	5
IC5	567	4.13	0.82	2	5
BP1	567	3.74	0.85	1	5
BP2	567	3.79	0.82	1	5
BP3	567	3.78	0.77	1	5
BP4	567	3.78	0.75	1	5
BP5	567	3.78	0.74	1	5

Table 3 shows the mean scores of survey items across five respondent groups. Overall, the evaluations are consistent, with most scores ranging between 3.7 and 4.2. The KA and KS items received the highest ratings (above 4.1 across groups), while the IC and BP items were relatively lower (around 3.7–3.9). These findings suggest that although perceptions vary slightly across items, differences between respondent groups are minimal.

Table 3: Mean scores of survey items by respondent group

Item	Marketing Director	Sales Director	General Director	Sales Manager	Technical Specialist
KM1	3.79	3.79	3.79	3.78	3.79
KM2	3.70	3.70	3.70	3.70	3.70
KM3	3.75	3.76	3.75	3.75	3.76
KM4	3.74	3.75	3.75	3.75	3.75
KM5	3.80	3.80	3.80	3.80	3.80
KAC1	3.76	3.76	3.76	3.76	3.76
KAC2	3.79	3.81	3.82	3.82	3.81
KAC3	3.74	3.76	3.76	3.76	3.76
KAC4	3.77	3.79	3.79	3.79	3.79
KAC5	3.72	3.69	3.69	3.69	3.68
KT1	4.07	4.05	4.06	4.06	4.05
KT2	4.03	4.02	4.02	4.02	4.02
KT3	4.00	3.99	3.99	3.99	3.99
KT4	4.01	4.00	4.00	4.00	4.00
KT5	4.04	4.04	4.04	4.03	4.04
KA1	4.17	4.14	4.14	4.14	4.14
KA2	4.20	4.17	4.16	4.15	4.17
KA3	4.21	4.18	4.18	4.18	4.18
KA4	4.24	4.22	4.22	4.22	4.22
KA5	4.23	4.22	4.22	4.21	4.22
KS1	4.21	4.19	4.19	4.18	4.18
KS2	4.12	4.11	4.11	4.12	4.11
KS3	4.09	4.08	4.08	4.09	4.08
KS4	4.22	4.19	4.20	4.20	4.19
KS5	4.22	4.19	4.19	4.19	4.19
IC1	4.05	4.04	4.04	4.04	4.05
IC2	3.97	3.98	3.98	3.98	3.98
IC3	4.05	4.05	4.05	4.06	4.05
IC4	4.08	4.08	4.08	4.08	4.08
IC5	4.12	4.11	4.11	4.11	4.11
BP1	3.74	3.74	3.74	3.73	3.74
BP2	3.78	3.78	3.78	3.78	3.79
BP3	3.76	3.76	3.76	3.75	3.76
BP4	3.78	3.78	3.78	3.77	3.78
BP5	3.78	3.77	3.77	3.77	3.78

4.2 Measurement Model

For evaluating the discriminant validity, convergent validity, and reliability of the constructs in order to determine how well the measuring model performed. The findings of the reliability analysis of the constructs using Cronbach's alpha (CA) are indicated in Table 4. All of the constructions' CA values are greater than 0.7, indicating their reliability. This study used average variance extracted (AVE), composite reliability (CR), and outer loadings (OL) to evaluate convergent validity. All numbers are over the 0.7 threshold, and no indicator loading is below it. With AVE values greater than 0.5, each construction satisfied the requirements. Convergent validity is supported by composite reliability values that exceed 0.7 (Hair et al., 2022).

Table 4: Reliability and Validity

Factor	Cronbach's Alpha (CA)	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)	Outer loading (OL)
BP	0.937	0.938	0.952	0.800	0.844 – 0.918
IC	0.884	0.884	0.915	0.683	0.777 – 0.867
KA	0.888	0.890	0.918	0.691	0.795 – 0.869
KAC	0.893	0.894	0.922	0.702	0.782 – 0.879
KM	0.893	0.894	0.921	0.700	0.803 – 0.872
KS	0.881	0.885	0.913	0.678	0.791 – 0.859
KT	0.819	0.820	0.873	0.580	0.726 – 0.778

This study computed the heterotrait-monotrait correlation ratio (HTMT) to assess discriminant validity. Table 5's HTMT values are below the 0.9 threshold, indicating discriminant validity (Henseler, Ringle & Sarstedt, 2014). As a result, the measurement model showed sufficient discriminant and convergent validity.

Table 5: Validity – HTMT Ratio

	BP	IC	KA	KAC	KM	KS	KT
BP							
IC	0.758						
KA	0.607	0.541					
KAC	0.485	0.482	0.349				
KM	0.674	0.581	0.353	0.341			
KS	0.597	0.594	0.482	0.380	0.380		
KT	0.754	0.740	0.545	0.374	0.565	0.560	

4.3 Structural Model

The f^2 effect sizes in Table 6 ranged from 0.024 to 0.153, indicating minor but acceptable effects of the exogenous variables on innovation and business performance. Specifically, KA, KAC, KS, and KT had minor effects on IC, with f^2 values ranging from 0.028 to 0.143. Among them, KT had the most potent effect on IC with an f^2 value of 0.143 (approaching the medium level), while KA and KAC had minimal effects (f^2 = 0.028 and 0.042, respectively). The effect of KM on IC was small (f^2 = 0.066), indicating a moderate role in shaping innovation capability.

For BP, KM had the largest effect size (f^2 = 0.153), indicating that knowledge management plays a significant role in improving business performance. KT and KA had minor effects (f^2 = 0.077 and 0.067), while KAC and KS had minimal effects (f^2 = 0.024 and 0.031).

Overall, the f^2 values ranged from 0.024 to 0.153, indicating that the exogenous variables had effects ranging from very small to medium on innovation capability (IC) and business performance (BP).

All Variance Inflation Factor (VIF) values were below the critical value of 5, indicating no multicollinearity among the variables. Furthermore, the endogenous constructs—innovation (Q^2 = 0.533) and business performance (Q^2 = 0.646)—showed Q^2 values above zero, which confirms the model's predictive relevance. Overall, the evaluation of effect size (f^2), VIF, and predictive relevance (Q^2) suggests that the structural model demonstrates satisfactory predictive power and no multicollinearity concerns among the constructs.

The analysis results showed that the R^2 value for the business performance variable (BP) reached 0.670, indicating that 67% of the variance in business performance was explained by the independent variables in the model, including innovation capability and knowledge-related factors. This is considered a high explanatory level, suggesting the model has good predictive power for the business performance of e-commerce enterprises. Meanwhile, the innovation capability variable (IC) had an R^2 value of 0.540, indicating that the knowledge-related factors explained 54% of the variance in innovation capability. According to Hair et al. (2022), both R^2 values fall within the medium to high range, reflecting that the research model has strong explanatory power and is appropriate for testing the proposed hypotheses.

Table 6: Result of f^2 , Q^2 , and VIF

Construct	F^2		VIF		Q^2	R^2
	BP	IC	BP	IC		
BP					0.646	0.670
IC	0.067		2.193		0.533	0.540
KA	0.067	0.028	1.445	1.406		
KAC	0.024	0.042	1.275	1.223		
KM	0.153	0.066	1.461	1.371		
KS	0.031	0.056	1.527	1.446		
KT	0.077	0.143	1.903	1.665		

The PLS-SEM analysis in Table 7 shows that all hypothesized relationships are supported, as all path coefficients are positive and statistically significant ($p < 0.01$). These findings indicate that knowledge-related factors (KA, KAC, KM, KS, KT) and innovation capability (IC) positively influence business performance (BP). Additionally, knowledge factors play a crucial role in enhancing firms' innovation capability.

Specifically, innovation capability (IC) positively affects business performance ($\beta = 0.219$, $t = 6.600$, $p < 0.001$), supporting Hypothesis H1. This result suggests that as firms enhance their innovation capabilities, their business performance improves correspondingly.

Regarding the knowledge-related factors, all have a positive impact on business performance. Knowledge management (KM) has the most decisive influence ($\beta = 0.270$, $t = 9.942$, $p < 0.001$), followed by knowledge transformation (KT) ($\beta = 0.219$, $t = 6.487$, $p < 0.001$), knowledge application (KA) ($\beta = 0.178$, $t = 5.830$, $p < 0.001$), knowledge sharing (KS) ($\beta = 0.124$, $t = 4.307$, $p < 0.001$), and finally, knowledge absorptive capability (KAC) ($\beta = 0.100$, $t = 3.779$, $p < 0.001$). These findings reinforce the positive role of knowledge resources in enhancing a firm's business performance. In addition, the knowledge-related factors also positively influence innovation capability (IC). Among them, knowledge transformation (KT) has the most significant impact ($\beta = 0.329$, $t = 8.088$, $p < 0.001$), indicating that transformation plays a key role in the innovation process. The other factors include: knowledge absorptive capability (KAC) ($\beta = 0.153$, $t = 5.145$, $p < 0.001$), knowledge sharing (KS) ($\beta = 0.193$, $t = 4.888$, $p < 0.001$), knowledge management (KM) ($\beta = 0.203$, $t = 6.067$, $p < 0.001$), and knowledge application (KA) ($\beta = 0.134$, $t = 3.406$, $p = 0.001$). These results show that knowledge-related factors are essential foundations for promoting innovation in e-commerce enterprises. Overall, the research model confirmed all proposed hypotheses, clarifying the mediating role of innovation capability in the relationship between knowledge and business performance.

Table 7: Results of Structural Model

Relationships	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
IC -> BP	0.219	0.216	0.033	6.600	0.000
KA -> BP	0.178	0.179	0.030	5.830	0.000
KA -> IC	0.134	0.138	0.039	3.406	0.001
KAC -> BP	0.100	0.101	0.026	3.779	0.000
KAC -> IC	0.153	0.151	0.030	5.145	0.000
KM -> BP	0.270	0.271	0.027	9.942	0.000
KM -> IC	0.203	0.201	0.033	6.067	0.000

Relationships	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values
KS -> BP	0.124	0.123	0.029	4.307	0.000
KS -> IC	0.193	0.196	0.039	4.888	0.000
KT -> BP	0.219	0.220	0.034	6.487	0.000
KT -> IC	0.329	0.328	0.041	8.088	0.000

This research employed SmartPLS bootstrapping with 5,000 resamples to investigate the mediating effect of innovation capability (IC) on the relationship between knowledge management components and business performance (BP) (Hayes, 2013). Due to its effectiveness in accurately estimating indirect effects, this approach is widely recommended for assessing mediation within PLS-SEM frameworks. The results demonstrated that innovation capability partially mediates the impact of the three knowledge management dimensions on business performance. The mediating effects are summarized in Table 8, which details the role of innovation capability in linking knowledge management to business outcomes.

Table 8: Result - Mediating Role of Innovation

Relationships	Indirect effect			Direct effect			Mediation Role	Result
	Beta	T Statistics	P Values	Beta	T Statistics	P Values		
KA -> IC -> BP	0.029	3.085	0.002	0.178	5.830	0.000	Partial	Supported
KAC -> IC -> BP	0.034	4.050	0.000	0.100	3.779	0.000	Partial	Supported
KM -> IC -> BP	0.045	4.596	0.000	0.270	9.942	0.000	Partial	Supported
KS -> IC -> BP	0.042	3.938	0.000	0.124	4.307	0.000	Partial	Supported
KT -> IC -> BP	0.072	4.817	0.000	0.219	6.487	0.000	Partial	Supported

The mediation analysis results from the PLS-SEM model indicate that innovation capability (IC) partially mediates the relationship between knowledge resources and business performance (BP) in small and medium-sized e-commerce enterprises in Ho Chi Minh City. Figure 2 presents the PLS-SEM model, illustrating the relationships among the latent variables in the research model and the magnitude of their effects.

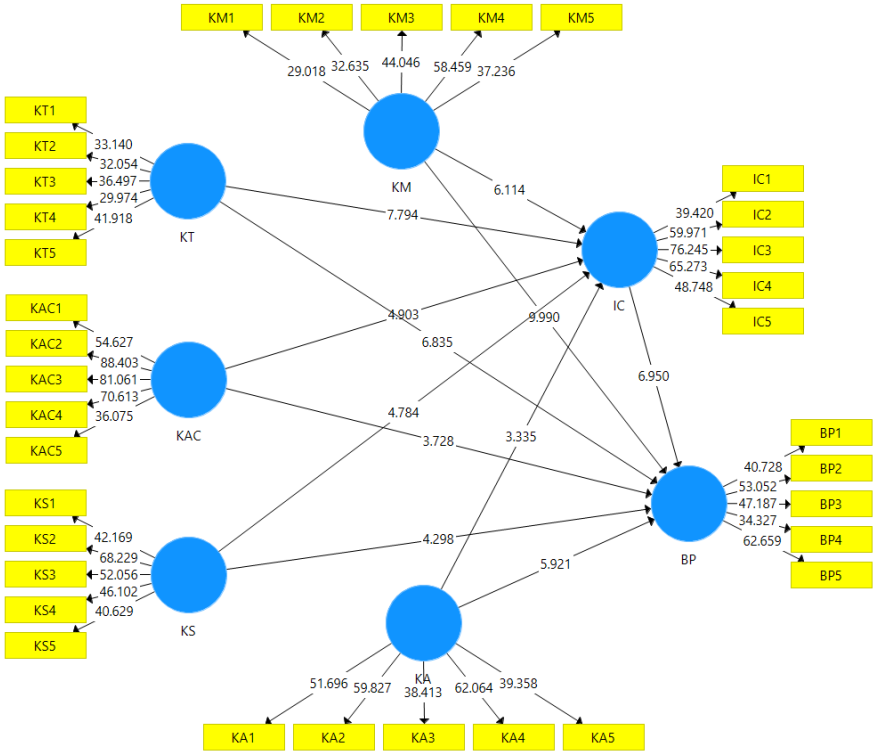

Figure 2: PLS – SEM Model

Specifically, knowledge application (KA) has a significant effect on business performance through two paths: a direct effect (β = 0.178, t = 5.830, p < 0.001) and an indirect effect via IC (β = 0.029, t = 3.085, p = 0.002). This indicates that when firms effectively apply knowledge in practice, they not only achieve immediate performance improvements but also enhance their innovation capabilities, which in turn further boost business outcomes. The partially mediated relationship by IC demonstrates that innovation acts as a crucial bridge between practical knowledge and ultimate business results.

Similarly, knowledge absorptive capability (KAC) also shows an indirect effect on BP through IC (indirect β = 0.034, t = 4.050, p < 0.001), alongside a direct effect (β = 0.100, t = 3.779, p < 0.001). This highlights that the ability to learn and absorb external knowledge (from markets, partners, customers, etc.) not only directly improves performance but also helps develop innovation capabilities to adapt to the competitive digital environment. According to the RBV theory, knowledge is a strategic resource, but innovation capability enables firms to reorganize those resources to create sustainable competitive advantage.

For knowledge management (KM) – the core component of a firm's knowledge base – the results show substantial impacts both directly (β = 0.270, t = 9.942, p < 0.001) and indirectly through IC (β = 0.045, t = 4.596, p < 0.001). This supports the argument by Nonaka & Takeuchi (1995) that an effective knowledge management system not only optimizes the use of existing knowledge but also serves as a launching pad for innovation in products, processes, and business models.

Knowledge sharing (KS) – the activity that facilitates the dissemination and exchange of knowledge within the firm – also influences BP through IC (indirect β = 0.042, t = 3.938, p < 0.001) and directly (β = 0.124, t = 4.307, p < 0.001). This suggests that a knowledge-sharing culture can trigger collective innovation capabilities, accelerating problem-solving, new product development, and improving service quality.

Lastly, knowledge transformation (KT) – the ability to convert tacit knowledge into explicit knowledge and vice versa – shows the most substantial indirect effect via IC on BP (β = 0.072, t = 4.817, p < 0.001), alongside a significant direct effect (β = 0.219, t = 6.487, p < 0.001). This clarifies the foundational role of the ability to convert knowledge into actionable capabilities. According to RBV, integrating and reconfiguring knowledge is essential for generating strategic value from intangible resources such as organizational knowledge.

All relationships reflect the partial mediation role of innovation capability, meaning that IC is not only a transmission mechanism but also an independent and important driver of business performance. These results underscore that to fully leverage knowledge resources, firms must focus on developing innovation capability as a dynamic capability—one that enables organizations to adapt and thrive in a volatile business environment.

5. Discussion

5.1 Discussion of Research Result

The research findings have confirmed the positive relationships between components of knowledge management and innovation capability in enhancing the business performance of small and medium-sized enterprises (SMEs) in the e-commerce sector in Vietnam. The PLS-SEM model analysis shows that all hypotheses (H1–H11) are supported at a high level of statistical significance (p < 0.001), reinforcing the central role of knowledge and innovation in driving firm performance. Each factor in the model contributes distinct insights, as discussed below:

Knowledge Management (KM) has the most substantial direct impact on business performance (β = 0.270) and a significant influence on innovation capability (β = 0.203). This supports the perspectives of the RBV and KBV theories, which consider knowledge a strategic resource and the ability to manage it as a critical driver of organizational success. According to Nonaka & Takeuchi (1995), effective knowledge management not only preserves existing knowledge but also fosters a continuous learning and innovation environment. This finding is also consistent with Wang & Lin (2013), who highlighted that a knowledge management orientation can enhance organizational performance.

Knowledge Transformation (KT) exerts the most decisive influence on innovation capability (β = 0.329), indicating that the ability to convert tacit knowledge into explicit knowledge (and vice versa) is a key enabler of innovation. This clearly supports the Dynamic Capabilities theory, which emphasizes the importance of reconfiguring knowledge in response to environmental changes. KT also positively impacts business performance (β = 0.219). This aligns with the findings of Muñoz et al. (2022) and Cruz-Ros, Guerrero-Sánchez & Miquel-Romero (2021), who stressed that knowledge transformation enhances product, service, and business model innovation.

Knowledge Sharing (KS) has a positive effect on both innovation capability (β = 0.193) and business performance (β = 0.124). This suggests that a knowledge-sharing culture within organizations fosters collective innovation, faster problem-solving, and improved operational efficiency. These findings support prior studies (Doğan & Doğan, 2020; Wang & Wang, 2012) and affirm the importance of knowledge sharing in open innovation strategies, especially in dynamic e-commerce environments.

Knowledge Application (KA) significantly impacts business performance (β = 0.178) and innovation capability (β = 0.134), emphasizing the role of applying knowledge in practice to generate value. Alavi & Leidner (2001) emphasized that knowledge application is the most critical phase of the knowledge management process, bridging the gap between theory and action. The findings also align with the KBV theory, which holds that knowledge only becomes a source of competitive advantage when effectively applied to support innovation.

Knowledge Absorptive Capacity (KAC) positively influences both innovation capability (β = 0.153) and business performance (β = 0.100). This validates Cohen & Levinthal's (1990) Absorptive Capacity theory, which posits that the ability to recognize, assimilate, and apply external knowledge is essential for innovation and organizational adaptation. The result is also consistent with Gebauer, Worch & Truffer (2012), who emphasized that absorptive capacity facilitates knowledge transfer and improves organizational outcomes.

Innovation Capability (IC) is not only a mediating variable but also has a direct and significant impact on business performance (β = 0.219). This highlights the role of IC as a dynamic capability that enables organizations to reconfigure and deploy resources to respond effectively to competitive environments (Teece, Pisano & Shuen, 1997). Prior studies (Bahta et al., 2020; Agyapong, Agyapong & Poku, 2017) have also shown that innovation capability significantly enhances SME performance in digital economies.

The mediation analysis confirms that innovation capability partially mediates the relationship between knowledge-related factors and business performance. All indirect effects are statistically significant ($p < 0.01$), proving that IC acts as a key mechanism for transforming knowledge into tangible business outcomes. This reinforces the theoretical integration of KBV and Dynamic Capabilities, where IC is viewed as the strategic converter of intangible resources into performance improvements.

The novelty of this study lies in its context-specific contribution, theoretical integration, and methodological rigor. By examining e-commerce SMEs in Vietnam, the research extends prior studies that have predominantly focused on developed economies or large enterprises. The integration of RBV, KBV, and Dynamic Capabilities theory provides a comprehensive explanation of how knowledge-related factors drive innovation and business performance. Moreover, by highlighting the partial mediating role of innovation capability, the study clarifies the mechanism through which knowledge resources are transformed into tangible business outcomes. These contributions enrich the existing body of knowledge and offer meaningful implications for scholars and practitioners.

5.2 Managerial Implications

The findings of this study provide important guidance for managers of small and medium-sized enterprises (SMEs) in the e-commerce sector. Since knowledge management (KM) showed the most substantial direct impact on business performance, managers should prioritize building robust KM systems that include effective processes for acquiring, storing, and utilizing knowledge. In practice, firms can adopt digital knowledge repositories, collaborative platforms, and internal wikis to ensure knowledge is accessible. Managers are also advised to establish reward and recognition systems that encourage employees to share knowledge, thereby reducing duplication of effort and accelerating innovation cycles. In addition, cross-functional workshops, mentoring programs, and after-action reviews can be used to strengthen knowledge transformation. To translate knowledge into tangible results, managers should integrate knowledge application into routine decision-making, product development, and customer service activities.

Beyond managerial practice, the results also have implications for policymakers. Government agencies and regulators can design targeted support programs—such as subsidies for digital knowledge systems, training initiatives to improve absorptive capacity, and incentives for collaborative innovation networks—that directly strengthen SMEs' knowledge capabilities. By creating an enabling environment, policymakers can help SMEs overcome structural resource limitations and enhance their contribution to the digital economy.

Other stakeholders also play an important role. SME associations can act as intermediaries by creating collaborative platforms and knowledge-sharing networks across firms. Universities and training institutions can integrate KM and innovation capability into educational programs, thereby equipping the workforce with the

skills required to support digital transformation. Investors and incubators can use knowledge-related capabilities as a key criterion in evaluating SMEs' growth potential, providing funding and mentorship to firms with strong knowledge and innovation systems.

Overall, the study highlights that managers, policymakers, and stakeholders must act in a coordinated manner. While managers focus on firm-level practices to strengthen knowledge processes and innovation, policymakers and ecosystem partners should provide complementary resources and support structures. Such alignment will maximize the impact of knowledge and innovation capabilities on the long-term performance and competitiveness of SMEs in Vietnam's digital economy.

5.3 Limitations and Future Research Directions

Despite the valuable insights provided by this study, several limitations must be acknowledged, which also open up potential avenues for future research.

This study was conducted with a sample of SMEs operating primarily in the e-commerce sector in Ho Chi Minh City, Vietnam. While this focus enhances the contextual relevance, it limits the generalizability of the findings to other geographic regions or industries. Future studies could expand the sample to include SMEs from other cities and rural areas, as well as across different ASEAN countries, to compare the cultural and economic effects on knowledge management and innovation.

The research employed a cross-sectional design, capturing data at a single point in time. As such, it does not allow for the assessment of causal relationships or changes in innovation capability and performance over time. Longitudinal studies are recommended to track how knowledge-related capabilities and business performance evolve in response to internal changes and external market dynamics.

Data for this study were collected using self-reported questionnaires, which may introduce response biases such as social desirability or subjective interpretation. Future research may benefit from incorporating multiple data sources, such as objective performance metrics, financial reports, or third-party evaluations, to enhance data accuracy and reduce bias.

Although the model explains a significant portion of the variance in innovation capability and business performance, other influential variables may not be included in this study. Factors such as leadership style, organizational culture, technological infrastructure, market turbulence, and digital maturity could also play mediating or moderating roles. Future studies should consider integrating these variables for a more comprehensive analysis.

While the study utilized validated measurement scales adapted from prior research, the context-specific nature of the Vietnamese e-commerce environment may require further refinement or development of culturally tailored instruments. Future research could employ qualitative methods or exploratory factor analysis in different cultural settings to refine scale reliability and validity.

This study focused on direct and mediating effects but did not fully explore the potential moderating effects or interaction terms among knowledge components. For instance, future research could investigate whether the relationship between knowledge application and performance is moderated by organizational agility or environmental uncertainty.

In conclusion, while the current study offers a robust model and empirical evidence regarding the role of knowledge and innovation in e-commerce SMEs, addressing these limitations in future research will further enhance theoretical contributions and provide deeper insights for both scholars and practitioners.

6. Conclusion

In the context of an increasingly dynamic and knowledge-intensive digital economy, especially in the e-commerce sector, the role of knowledge as a strategic resource has become more vital than ever. This study investigated the impact of knowledge-related factors—specifically knowledge management, knowledge absorptive capability, knowledge application, knowledge transformation, and knowledge sharing—on innovation capability and business performance among small and medium-sized enterprises (SMEs) in Vietnam. Grounded in the Resource-Based View (RBV), Knowledge-Based View (KBV), and Dynamic Capabilities theories, the research proposed and tested a comprehensive model using Partial Least Squares Structural Equation Modeling (PLS-SEM).

The empirical results confirmed that all knowledge components positively and significantly influence both innovation capability and business performance. Among them, knowledge management had the most substantial direct effect on business performance, while knowledge transformation had the most significant impact on innovation capability. Moreover, innovation capability partially mediated the relationship between knowledge-related factors and business performance, highlighting its importance as a dynamic mechanism that converts intangible knowledge assets into tangible organizational outcomes.

These findings make several theoretical contributions. First, they validate and extend the RBV and KBV frameworks by demonstrating how knowledge, when effectively managed and applied, can drive performance through enhanced innovation. Second, the study underscores the relevance of the Dynamic Capabilities theory by showing that innovation capability is essential in enabling SMEs to respond to market shifts and maintain competitiveness. Third, the model provides empirical evidence that supports integrating multiple theoretical perspectives to better explain organizational behavior in the digital age.

From a practical standpoint, the results offer actionable insights for SME managers, particularly in developing economies. To thrive in highly competitive e-commerce environments, firms must prioritize investments in knowledge systems, foster a culture of sharing and continuous learning, and institutionalize innovation as a core competency across all operations.

However, the study is not without limitations. Its scope was geographically constrained, the design was cross-sectional, and data relied on self-reported responses. Future research should address these issues by conducting longitudinal, multi-country studies, using mixed-methods, and incorporating additional variables such as digital transformation readiness, leadership style, and environmental turbulence.

In conclusion, this study affirms that strategic knowledge management, coupled with strong innovation capability, constitutes a foundational pathway for enhancing the business performance of SMEs in the digital economy. By understanding and applying these insights, both scholars and practitioners can help build more resilient, agile, and knowledge-driven enterprises in the years to come.

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Appendix A. Survey Measurement Items

Construct	Code	Measurement Item	Source
Knowledge Management (KM)	KM1	Our company frequently shares information and knowledge across departments to improve e-commerce business performance.	Tseng & Fan (2011)
	KM2	Our company has an effective system for collecting and storing customer information.	
	KM3	Our company encourages employees to apply their knowledge in their daily work.	
	KM4	Our company has processes that make it easy for employees to store and retrieve information.	
	KM5	Our company regularly updates and improves its knowledge management processes to better align with the e-commerce market.	
Knowledge Absorptive Capacity (KAC)	KAC1	Our company is willing to acquire and apply external knowledge (from customers, partners, competitors, etc.) to drive innovation in e-commerce.	Truong & Nguyen (2024)
	KAC2	Our company collects e-commerce industry information from both official sources (reports, conferences, government agencies) and informal sources (social media, forums, groups, etc.).	
	KAC3	Our company effectively utilizes acquired knowledge to improve performance and innovate products/services.	
	KAC4	Our company is willing to invest in suitable new technologies (e.g., AI, chatbots, data analytics) to enhance business performance.	
	KAC5	Our company regularly evaluates the impact of market changes in e-commerce to promptly introduce new products and services.	
Knowledge Transformation (KT)	KT1	Our company encourages employees to share ideas and professional knowledge.	Tseng & Fan (2011)
	KT2	Our company has mechanisms to convert individual experiences into shared organizational documents/guidelines.	
	KT3	Our company combines multiple sources of information to create new knowledge.	
	KT4	Our company applies best practices across different departments.	
	KT5	Our company encourages learning from past experiences to improve future performance.	
Knowledge Application (KA)	KA1	Our company has specific processes for applying accumulated knowledge from practical experience to e-commerce business operations.	Pérez-López & Alegre (2012); Dedunu, Weerasinghe & Wickcramasinghe (2025)
	KA2	Our company has procedures for leveraging internal knowledge to develop new e-commerce products or services.	
	KA3	Our company can adapt and apply knowledge to respond to changes in the e-commerce competitive environment.	
	KA4	Our company frequently applies lessons learned from past situations to current issues.	
	KA5	Our company encourages employees to apply existing knowledge to minimize risks when handling similar problems in the future.	
Knowledge Sharing (KS)	KS1	Our company can absorb new technical knowledge from partners.	Aisjah, Arsawan & Suhartanto (2023)
	KS2	Our company can solve practical problems by leveraging knowledge from partners.	
	KS3	Our company regularly collaborates with partners on training and professional development.	
	KS4	Our company proactively shares and updates partners on e-commerce industry trends.	
	KS5	Our company shares internal knowledge with partners to enhance business performance and improve customer service jointly.	

Innovation Capability (IC)	IC1	Our company has developed new operational or production methods/processes suitable for the e-commerce environment.	Lam et al. (2021); Truong & Nguyen (2024)
	IC2	Our company has introduced new (or improved) management methods/processes in the past three years.	
	IC3	Our company has introduced new (or improved) products/services in the past three years.	
	IC4	Our company regularly improves or adjusts existing products/services to meet market needs.	
	IC5	Our company demonstrates creativity in organizing and implementing business activities.	
Business Performance (BP)	BP1	Our company has achieved sustainable business growth over the past three years.	Truong & Nguyen (2024)
	BP2	Our company has a good reputation in the e-commerce sector.	
	BP3	Customers highly evaluate the quality of our products/services.	
	BP4	Our company has achieved its revenue targets over the past three years.	
	BP5	Our company has achieved its profit targets over the past three years.	