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FACTORS AFFECTING THE INTENTION TO ADOPT BLOCKCHAIN TECHNOLOGY IN E-COMMERCE IN VIETNAM

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INTRODUCTION

1. The urgency of the research topic

In the context of the Fourth Industrial Revolution, the convergence of emerging digital technologies such as artificial intelligence, big data, and the Internet of Things is profoundly changing the structure and operation of the global economy. In this trend, blockchain technology has emerged as a groundbreaking data infrastructure due to its decentralized, immutable, and transparent characteristics, enabling the establishment of reliable transaction mechanisms without intermediaries, thereby opening up the potential to enhance economic management efficiency and market regulation quality.

E-commerce is rapidly developing and has become a crucial pillar of the digital economy, particularly in Vietnam, where the market continues to grow significantly. However, the rapid expansion of e-commerce also brings many challenges in management, such as trade fraud, lack of transparency in traceability, data security risks, and difficulties in tax management. These issues not only undermine market trust but also create an urgent need to modernize state management tools toward a technology and data-driven approach.

In that context, blockchain technology is considered a potential solution to address the limitations of e-commerce through its ability to record transparent data, trace origins, and enhance accountability. However, current research mainly focuses on the fields of finance and supply chains, while the analysis of blockchain application behavior in e-commerce, particularly from the perspective of economic management and the regulatory role of the state, remains limited, especially in Vietnam.

Additionally, Vietnam is vigorously implementing national digital transformation strategies and developing blockchain technology, creating a favorable framework but also requiring a scientific basis to guide policies and promote technology application. Therefore, the research on ***"Factors influencing the Intention to Adopt Blockchain Technology in E-commerce in Vietnam"*** is not only theoretically significant in filling research gaps but also practically important in supporting businesses to enhance their competitiveness and assisting the government in perfecting management mechanisms, aiming for the development of a transparent and sustainable digital economy.

2. Research objectives and tasks

- ***Theoretical objectives:***

The general objective of the thesis is to construct and validate a model of the factors influencing the intention to adopt blockchain technology by B2C e-commerce enterprises in Vietnam, while clarifying the regulatory role of government support.

- **Research tasks:**

The research tasks include: (i) systematizing the theoretical basis and proposing a research model; (ii) constructing measurement scales for the variables; (iii) model and hypothesis testing; (iv) analyzing results in the institutional context; and (v) proposing governance and policy implications.

3. Research objects and scope

Research subject: The thesis focuses on studying the factors influencing the intention to adopt blockchain technology by e-commerce enterprises, while also analyzing the supportive and regulatory roles of the government in promoting the application of this technology within the context of sustainable digital economy development in Vietnam.

Scope of the study: In terms of content, the research adopts a management-behavior approach to analyze the impact of groups of factors related to technology, organization, environment, and institutions on the intention to apply blockchain in e-commerce enterprises, while also examining the regulatory role of policies and legal frameworks.

In terms of space, the research is conducted on B2C e-commerce businesses in the retail sector in Vietnam.

Regarding the timeline, the research data includes secondary data up to 2024 and primary data collected during the period of 2022- 6/2025; the recommendations are oriented toward the period of 2025 - 2030, with a vision until 2050.

4. Theoretical, practical basis, and research methodology

Theoretical basis: The dissertation is built on the foundation of integrating theories of behavior and technology acceptance such as TRA, TPB, TAM, IDT, TR, and TOE to explain the intention to apply blockchain in e-commerce enterprises. At the same time, the COM-B model and the circular economy approach are supplemented to clarify the role of behavioral motivation and sustainable development orientation in the context of the digital economy.

Practical basis: The research is based on synthesizing international experiences and practices in Vietnam regarding the application of blockchain, digital transformation, and e-commerce development, along with the relevant policy and legal framework. Thru this, the thesis evaluates the current implementation status and the issues arising for businesses and regulatory agencies.

Research method: The thesis uses a mixed-methods approach. Qualitative research (literature review, expert interviews) aims to build models and scales; quantitative research uses surveys and analytical techniques such as Cronbach's Alpha, CFA, and SEM (SPSS, AMOS) to test hypotheses. The expert method is used as a supplementary approach to interpret and reinforce the research results..

5. New points of the thesis

Theoretically: The research proposes a multi-theory integrated model, adds new observed variables, and identifies impact mechanisms such as partner pressure and trust, while also verifying the mediating and moderating roles of factors, especially government support.

In practice: the study provides empirical evidence on the factors influencing the intention to adopt blockchain, clarifying the direct, indirect, and moderating relationships, thereby supporting policy and business strategy formulation.

6. Theoretical and practical significance

The thesis contributes theoretically by developing a multidimensional analysis model of blockchain application behavior at the enterprise level while clarifying the role of institutional factors. In practice, the research provides a scientific basis for policy design, supporting e-commerce businesses in enhancing their competitiveness and promoting the development of a digital economy in a transparent and sustainable manner.

7. Structure of the thesis

The thesis consists of 5 chapters: (i) Research overview; (ii) Theoretical basis; (iii) Research methods; (iv) Current situation and research results; (v) Solutions and policy recommendations.

This study affirms that blockchain technology is a strategic tool in enhancing the efficiency of e-commerce management and developing the digital economy in Vietnam, while also emphasizing the crucial role of institutional factors and government support in promoting the technology adoption process at the enterprise level.

Chapter 1
OVERVIEW OF THE RESEARCH SITUATION

1.1. BLOCKCHAIN TECHNOLOGY AND ITS APPLICATION IN E-COMMERCE

Blockchain technology is structured as a distributed ledger system that enables the storage and verification of data through a decentralized mechanism, independent of intermediaries. The core characteristics of this technology include data immutability, transparency, high security, and consensus mechanisms among network nodes. As a result, blockchain creates a reliable transaction environment in which information is recorded and verified automatically, thereby minimizing the risk of fraud or data manipulation.

In the field of e-commerce, blockchain technology is considered a potential solution to overcome the limitations of traditional systems, such as high transaction costs, lack of transparency, and the risk of fraud. This technology enhances trust among participating parties through applications such as product traceability, intermediary-free electronic payments, and smart contracts. These applications not only optimize transaction processes but also improve supply chain management efficiency and enhance the consumer experience.

However, despite its potential, the implementation of blockchain technology in e-commerce still faces numerous challenges. Major barriers include limitations in technical infrastructure, high initial investment costs, the lack of standardized protocols, and, most notably, an incomplete legal framework. These factors hinder the widespread adoption of blockchain, requiring coordinated efforts among governments, businesses, and other stakeholders to fully realize its potential in e-commerce.

1.2. RESEARCH STREAMS ON ECONOMIC IMPACT AND INFLUENCING FACTORS

Previous studies on blockchain technology in e-commerce have generally developed along two main approaches, reflecting complementary perspectives on its role and applicability.

First, the research stream on economic impact focuses on analyzing the role of blockchain in improving market efficiency. These studies highlight blockchain’s ability to reduce transaction costs by eliminating intermediaries, minimizing information asymmetry, and enhancing transparency in exchange processes. Consequently, blockchain contributes to improved resource allocation, increased market trust, and the advancement of the digital economy.

Second, the research stream on technology acceptance behavior focuses on identifying the factors influencing the intention and adoption of blockchain at both individual and organizational levels. Common theoretical models such as TAM

(Technology Acceptance Model), TPB (Theory of Planned Behavior), and TOE (Technology–Organization–Environment framework) are widely used to explain factors such as perceived usefulness, ease of use, technological readiness, environmental pressure, and institutional conditions.

In recent years, research has increasingly shifted toward integrated models that combine multiple theoretical frameworks to better capture the complexity and multidimensional nature of blockchain adoption in e-commerce. This approach enables the simultaneous examination of technological, organizational, environmental, and institutional factors, thereby improving explanatory and predictive power in real-world contexts.

1.3. RESEARCH ON BLOCKCHAIN TECHNOLOGY IN VIETNAM

In Vietnam, research on blockchain remains limited and has primarily focused on sectors such as finance, banking, and logistics, with recent expansion into e-commerce. Existing studies indicate that factors such as technological capability, trust, leadership support, and the policy environment significantly influence blockchain adoption. However, the literature remains fragmented, lacks an integrated analytical framework, and has yet to fully clarify the role of the State in promoting technology adoption.

1.4. LEGAL FRAMEWORK, STATE MANAGEMENT, AND INSTITUTIONAL BARRIERS

The application of blockchain in e-commerce is strongly influenced by the institutional environment, in which the State plays a critical role in establishing legal frameworks, supportive policies, and regulatory mechanisms. Although Vietnam has introduced various policies to promote digital transformation, the legal framework for blockchain remains incomplete, inconsistent, and unclear. This creates barriers such as inadequate regulatory mechanisms, limited support for businesses, and weak coordination capacity, thereby affecting technology adoption decisions.

1.5. RESEARCH GAPS

The literature review reveals several significant gaps: (i) the absence of an integrated theoretical framework that simultaneously incorporates technological, organizational, and institutional factors; (ii) limited research within the context of e-commerce; (iii) insufficient clarification of the proactive role of the State as a regulatory actor; and (iv) a lack of empirical evidence in the Vietnamese context. These gaps highlight the need for a comprehensive, dual-approach study in Vietnam.

Chapter 2
THEORETICAL FOUNDATIONS ON FACTORS INFLUENCING THE INTENTION TO ADOPT BLOCKCHAIN TECHNOLOGY IN E-COMMERCE

2.1. OVERVIEW OF E-COMMERCE ACTIVITIES IN VIETNAM

E-commerce is widely recognized as a central component of the digital economy, playing a crucial role in digital transformation and modern economic development. It is characterized by the digitization of all or part of commercial transactions, including information search, contract execution, payment, and goods distribution, thereby expanding market boundaries beyond traditional geographical constraints.

In the context of Vietnam, e-commerce has experienced rapid growth, driven by improvements in information technology infrastructure, a high rate of internet penetration, and evolving consumer behavior. E-commerce activities not only enable businesses to expand their markets, optimize operational costs, and enhance management efficiency, but also foster competition, improve service quality, and enhance the consumer experience.

Furthermore, e-commerce contributes significantly to economic growth by improving resource allocation efficiency, promoting innovation, and facilitating the emergence of new business models. However, its rapid expansion also raises significant regulatory challenges, particularly in terms of information transparency, data security, and product quality control. These challenges necessitate the adoption of appropriate technological solutions and policy frameworks to ensure sustainable development.

2.2. THEORIES ON BLOCKCHAIN TECHNOLOGY

Blockchain technology can be conceptualized as a distributed ledger system that enables transparent, secure, and intermediary-free data storage and validation. Fundamentally, it operates through consensus mechanisms among network nodes, where information is recorded in blocks that are chronologically linked, ensuring immutability and resistance to alteration. Its core characteristics include decentralization, transparency, high security, and the ability to automate processes through smart contracts.

From a functional perspective, blockchain enhances data reliability, reduces the risk of fraud, and optimizes transaction processes by eliminating or minimizing the role of intermediaries. Consequently, it contributes to lowering transaction costs, improving operational efficiency, and strengthening information control within digital economic systems.

In the e-commerce sector, blockchain is considered a key solution for enhancing transparency, ensuring data integrity, and strengthening information

security. It supports applications such as product traceability, transaction verification, and the automation of business processes through smart contracts. Moreover, it contributes to the development of sustainable supply chains, enhances consumer trust, and improves overall market efficiency.

Nevertheless, the adoption of blockchain in e-commerce faces several challenges, including limitations in technological infrastructure, high implementation costs, the absence of standardized technical frameworks, and an incomplete legal environment. These challenges require coordinated efforts among stakeholders to effectively unlock the potential of the technology.

2.3. RELEVANT FOUNDATION THEORIES

This study integrates foundational theories on behavior and technology acceptance to develop an analytical framework explaining the intention to adopt blockchain technology in e-commerce. Specifically, theories such as TRA (Theory of Reasoned Action) and TPB (Theory of Planned Behavior) are employed to examine the roles of attitudes, social norms, and perceived behavioral control in shaping technology adoption decisions. The TAM model (Technology Acceptance Model) further explains the influence of perceived usefulness and perceived ease of use on user acceptance.

In addition, theories such as IDT (Innovation Diffusion Theory) and TR (Technology Readiness) provide insights into the diffusion process of innovation and the readiness of organizations to adopt new technologies. The TOE framework (Technology–Organization–Environment) offers a comprehensive perspective by simultaneously considering internal and external factors influencing technology adoption at the organizational level. Furthermore, the COM-B model is incorporated to complement the behavioral perspective, emphasizing the roles of capability, opportunity, and motivation in driving adoption behavior.

At the same time, the study draws on circular economy principles and modern economic growth theories to highlight the role of blockchain in improving resource efficiency, enhancing transparency, and supporting sustainable development. The integration of these theoretical perspectives enables the construction of a comprehensive research framework that captures the multidimensional nature of blockchain adoption in the context of e-commerce and the broader digital economy.

2.4. HYPOTHESIS DEVELOPMENT AND RESEARCH MODEL

2.4.1. Blockchain adoption intention (IB)

Blockchain adoption intention reflects users' deliberate willingness, readiness, and commitment to accept and implement blockchain technology. It plays a pivotal role in predicting actual adoption behavior and mitigating the risk of technology implementation failure. In the context of e-commerce, adoption

intention represents a critical antecedent of successful blockchain diffusion and utilization.

2.4.2. Perceived ease of use (PEU) and perceived usefulness (PU)

Based on the Technology acceptance model (TAM), perceived ease of use reflects the extent to which a technology is considered easy to understand, implement, and operate, thereby reducing adoption barriers and enhancing firms' willingness to adopt blockchain technology in e-commerce.

Meanwhile, perceived usefulness refers to the degree to which blockchain technology is perceived to improve organizational performance, operational efficiency, and value creation. Higher perceived usefulness is therefore expected to positively influence blockchain adoption intention.

Accordingly, the following hypotheses are proposed:

H_1: Perceived ease of use (PEU) has a positive effect on blockchain adoption intention in e-commerce in Vietnam.

H_2: Perceived usefulness (PU) has a positive effect on blockchain adoption intention in e-commerce in Vietnam.

2.4.3. Traceability (TA)

Enhanced traceability enabled by blockchain technology improves transparency, reliability, and the accuracy of product information throughout the value chain. These improvements strengthen enterprises' evaluation of blockchain's functional benefits, thereby positively influencing perceived usefulness in e-commerce contexts.

Therefore, this study proposes the following hypothesis:

H_3: Traceability has a positive effect on perceived usefulness of blockchain technology in e-commerce in Vietnam.

2.4.4. Cost savings (CS)

Operational cost savings derived from blockchain adoption-such as reduced transaction costs, lower verification expenses, and minimized intermediary involvement-contribute positively to enterprises' perceptions of the technology's usefulness. Enhanced perceived usefulness, in turn, indirectly promotes blockchain adoption intention in e-commerce firms.

Thus, the following hypothesis is proposed:

H_4: Cost savings have a positive effect on perceived usefulness of blockchain technology in e-commerce in Vietnam.

2.4.5. Technology readiness (TR)

Technology readiness reflects an enterprise's level of preparedness in terms of digital infrastructure, human resources, and digital management capabilities. A higher degree of technology readiness provides a solid foundation for understanding, implementing, and effectively utilizing blockchain technology in e-commerce.

Accordingly, technology readiness is expected to directly influence blockchain adoption intention, as well as indirectly enhance perceived usefulness and perceived ease of use. The following hypotheses are proposed:

H_5: Technology readiness has a positive effect on blockchain adoption intention in e-commerce in Vietnam.

H_6: Technology readiness has a positive effect on perceived usefulness of blockchain technology in e-commerce in Vietnam.

H_7: Technology readiness has a positive effect on perceived ease of use of blockchain technology in e-commerce in Vietnam.

2.4.6. Data privacy security (DPS)

In the context of e-commerce, increasing risks related to data breaches and data misuse have heightened concerns over privacy and security. Blockchain technology's ability to ensure data integrity, confidentiality, and user privacy is considered a core advantage that enhances system reliability and governance effectiveness.

Therefore, the following hypothesis is proposed:

H_8: Data privacy security have a positive effect on perceived usefulness of blockchain technology in e-commerce in Vietnam.

2.4.7. Trading partner pressure (TPP)

In e-commerce ecosystems, pressure from key trading partners—through requirements for system integration, standardization, and technical collaboration—can reduce perceived complexity and implementation risks associated with blockchain adoption. Such pressure is expected to facilitate ease of use perceptions among adopting firms. Thus, the study proposes the following hypothesis:

H_9: Trading partner pressure has a positive effect on perceived ease of use of blockchain technology in e-commerce in Vietnam.

2.4.8. Sustainability (SU)

In the e-commerce context, sustainability orientation-encompassing economic efficiency, social responsibility, and environmental protection-has emerged as a strategic driver motivating enterprises to seek technological solutions that support long-term development. Blockchain technology is increasingly viewed as an enabler of sustainable and circular business practices. Accordingly, the following hypothesis is proposed:

H_{10}: Sustainability has a positive effect on blockchain adoption intention in e-commerce in Vietnam.

2.4.9. Trust (TRU)

In e-commerce environments, trust in blockchain technology-manifested through perceptions of security, transparency, and risk reduction-plays a foundational role in alleviating technological uncertainty and enhancing firms'

readiness to operate blockchain-based systems. Trust is therefore expected to improve users' perceptions of the technology's ease of use. Hence, this study proposes the following hypothesis:

H_{11}: Trust has a positive effect on perceived ease of use of blockchain technology in e-commerce in Vietnam.

2.5. THE MODERATING ROLE OF GOVERNMENT SUPPORT IN THE RELATIONSHIP BETWEEN TECHNOLOGY READINESS AND BLOCKCHAIN ADOPTION INTENTION

Government support, manifested through regulatory frameworks, public policies, and infrastructure investment, plays a critical role in reducing uncertainty and fostering the adoption of emerging technologies such as blockchain. For e-commerce enterprises in Vietnam, particularly small and medium-sized enterprises (SMEs), resource constraints often imply that technology readiness alone is insufficient to ensure a strong intention to adopt blockchain technology.

Within a supportive institutional environment, government support can amplify the positive impact of technology readiness on blockchain adoption intention by providing legal clarity, financial incentives, technical guidance, and infrastructural facilitation. Conversely, the absence of adequate government support and regulatory alignment may weaken this relationship, even when firms possess relatively high levels of technological capability. Accordingly, this study proposes the following hypothesis:

H_{12}: Government support moderates the relationship between technology readiness and blockchain adoption intention among e-commerce enterprises in Vietnam.

2.6. PROPOSED RESEARCH MODEL

Based on the hypotheses formulated above, this study proposes the following research model.

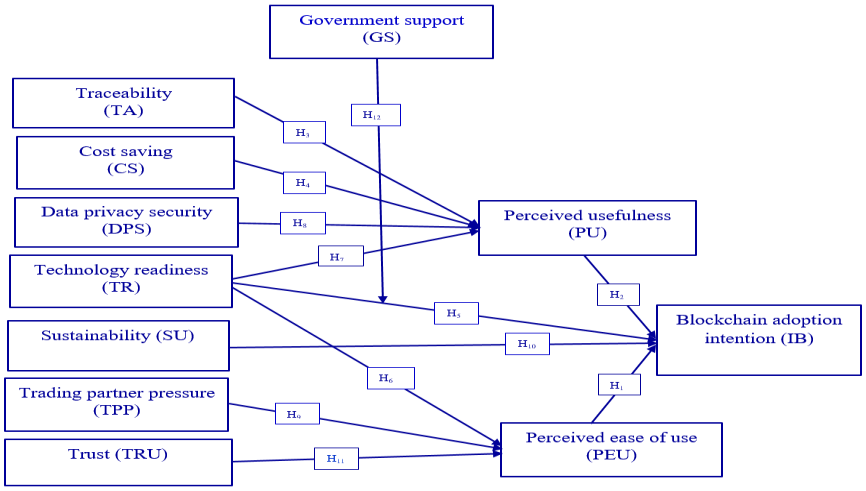


Figure 2.1. Proposed research model

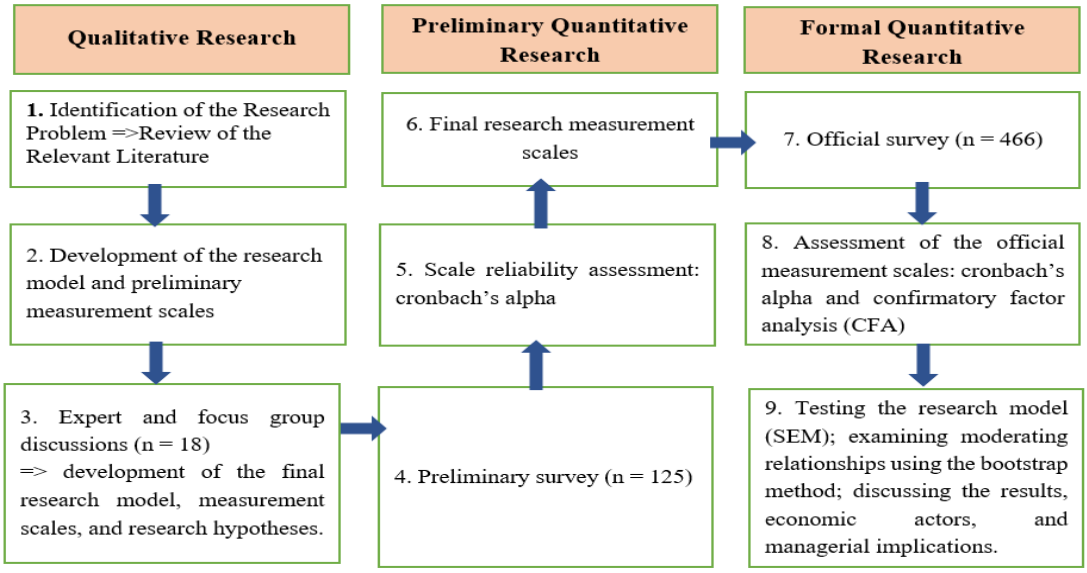
Source: Author's own research (2024)

Chương 3
RESEARCH METHODOLOGY

3.1. RESEARCH DESIGN

3.1.1. Selection of research methodology

This dissertation reviews qualitative, quantitative, and mixed-method research approaches, among which the mixed-methods approach is considered the most appropriate, as it enables both the exploration and development of constructs and hypotheses, as well as the empirical testing of relationships among research variables. In line with the research objectives of testing the proposed hypotheses and examining the moderating role of government support, the study adopts an integrated qualitative and quantitative approach to ensure the comprehensiveness and methodological rigor of the findings. The overall research process is summarized and illustrated in Figure 3.1 below.



Hình 3.1. Overview of the research process

3.1.2. Development of measurement scales and research model

3.1.2.1. Scale development and preliminary research

The dissertation develops an initial research model, identifies key constructs, and formulates draft measurement scales for the proposed relationships. The model comprises seven independent variables, including Cost Savings, Traceability, Data privacy security, Technological readiness, Sustainability, Trading partner pressure, and Trust; three dependent variables: Perceived usefulness, perceived ease of use, and Blockchain adoption intention, and one moderating variable: Government support.

The measurement scales are primarily adapted from validated instruments in prior studies and subsequently refined and extended to better fit the Vietnamese context and enhance the explanatory power of the proposed model.

3.1.2.2. Expert interviews and focus group discussions

In the context of Vietnam's e-commerce sector, the study utilizes qualitative methods, specifically in-depth interviews with 18 experts, to investigate and enhance the measurement scales and relationships within the research model. The findings indicate a high level of consensus regarding the relevance and clarity of the constructs and proposed relationships, thereby providing a solid foundation for establishing the finalized research model and hypotheses.

3.1.2.3. Development of the pilot survey questionnaire

Based on insights from expert interviews and group discussions, the measurement scales were adjusted to align with the Vietnamese B2C e-commerce context, and a pilot survey questionnaire was developed comprising three sections: research information and screening questions, respondent characteristics, and measurement items using a five-point Likert scale.

The pilot study, conducted with 125 valid responses, indicates that most measurement scales achieve acceptable reliability and validity as assessed by Cronbach's Alpha. Several items that did not meet the required criteria were removed, thereby establishing a robust foundation for the main survey.

3.2. SAMPLING AND DATA COLLECTION

3.2.1. Sample size

Based on recommendations for exploratory factor analysis and structural equation modeling (SEM), and given 39 observed variables, the final sample size of 466 valid observations exceeds the minimum threshold of 195 and is considered sufficient to ensure the reliability and accuracy of the research results.

3.2.2. Data collection subjects and procedures

Data were collected from 466 valid respondents who possess professional experience in B2C e-commerce enterprises in Vietnam. Convenience sampling methods, both offline and online, were employed, incorporating screening questions to ensure respondent relevance and data reliability.

3.3. DATA ANALYSIS METHODS

After data cleaning, coding, and entry, SPSS 21.0 was used to assess the reliability of the measurement scales through Cronbach's Alpha, followed by confirmatory factor analysis (CFA) to examine convergent, unidimensional, and discriminant validity. Subsequently, the theoretical model was tested using structural equation modeling (SEM) with AMOS 21.0, while the moderating effects were analyzed using the Bootstrap method with Hayes' PROCESS macro version 4.0.

Following the quantitative analysis, in-depth interviews were conducted to further explore perspectives, validate, and substantiate the underlying mechanisms and empirical findings of the study.

Chapter 4
CURRENT STATUS OF BLOCKCHAIN ADOPTION AND FACTORS INFLUENCING THE INTENTION TO ADOPT BLOCKCHAIN TECHNOLOGY IN E-COMMERCE IN VIETNAM

4.1. CURRENT STATUS OF BLOCKCHAIN TECHNOLOGY ADOPTION IN VIETNAM

4.1.1. Institutional and policy context of blockchain technology in Vietnam

In the context of the Fourth Industrial Revolution, blockchain technology has increasingly been recognized as a foundational digital infrastructure playing a critical role in restructuring transaction models within the digital economy and e-commerce. Acknowledging this trend, Vietnam has gradually developed and refined its policy and legal frameworks to regulate, guide, and promote the research and application of emerging technologies, including blockchain.

From 2017 to 2025, numerous resolutions, decisions, and action programs issued by the government and relevant ministries have focused on digital transformation, science and technology development, innovation, and the establishment of national digital infrastructure. These policy instruments reflect the state's proactive approach, which seeks to balance risk management with the encouragement of innovation and the adoption of advanced technologies. Notably, blockchain technology has been identified as one of the strategic technologies in national programs and strategies for science and technology development and digital transformation.

However, the existing legal framework has yet to establish a comprehensive, coherent, and explicit regulatory regime for blockchain applications. The legal status of blockchain technology, smart contracts, and distributed data systems has not been fully clarified. Moreover, the legal validity of transactions, evidence, and data recorded on blockchain platforms remains uncertain. This regulatory ambiguity increases legal risks for participants in e-commerce activities and constitutes a significant barrier to the large-scale deployment and commercialization of blockchain applications. Consequently, these limitations hinder the effective realization of national digital transformation objectives.

4.1.2. Current status of the blockchain technology market size in Vietnam

4.1.2.1. Global development context of the blockchain technology market

Over the past decade, blockchain technology has undergone a clear transition from the stages of research and experimentation to commercialization, thereby driving the rapid expansion of the global market for blockchain infrastructure and applications. The global blockchain market was valued at approximately USD

28.93 billion in 2024 and is projected to grow substantially in the coming years, reflecting the increasingly widespread adoption of this technology across multiple economic sectors. Key growth drivers include the expansion of decentralized finance, the digitization, fragmentation, and tokenization of assets on blockchain platforms, rising demand for transparency and data integrity in transaction systems, and the integration of blockchain with other digital technologies to enhance operational efficiency. Notably, since 2022, blockchain has increasingly been approached as a foundational digital infrastructure for comprehensive digital transformation, extending beyond its initial role as a supporting technology for cryptocurrencies. Owing to its capabilities in security, verification, and the reduction of reliance on intermediaries, blockchain is regarded as a significant catalyst for restructuring business models and digital transformation strategies in both the private and public sectors.

4.1.2.2. Market size and development trends of blockchain technology in Vietnam

Within the global context, Vietnam has emerged as one of the fastest-adopting blockchain markets in the region, as evidenced by the widespread use of digital assets and strong societal interest in blockchain-based applications. The size of Vietnam's blockchain market was estimated at approximately USD 350 million in 2023 and is projected to reach around USD 925 million by 2029, with a compound annual growth rate (CAGR) of approximately 17.4%. During the 2024–2025 period, on-chain cryptocurrency transaction values exceeded USD 200 billion, indicating large-scale economic interactions conducted on blockchain platforms and creating a foundation for the expansion of blockchain applications beyond digital assets. Concurrently, the market for blockchain solutions, platforms, and services is forecast to reach USD 2–2.5 billion by 2026, driven by the development of the domestic blockchain startup ecosystem and growing demand for applications in e-commerce, traceability, and supply chain management.

4.1.2.3. Development stages of the blockchain market in Vietnam

From a temporal perspective, the blockchain market in Vietnam can be divided into three main stages. The 2019-2020 period was characterized by experimentation, small-scale deployment, and concentration within technology communities and early-stage startups. The 2021-2022 period witnessed a surge driven by crypto-assets, accompanied by rapid growth in transaction volumes as well as heightened volatility and risk. From 2023 to the present, the market has entered a phase of adjustment and restructuring, marked by a shift away from speculative activities toward blockchain applications serving the real economy, such as data management, traceability, digital payments, and information authentication.

4.1.2.4. Factors influencing the size of the blockchain technology market in Vietnam

The size of the blockchain market in Vietnam is simultaneously influenced by multiple factors. On the one hand, the high level of adoption among individual users provides a broad market base for blockchain-related services. On the other hand, the national digital transformation strategy and government policies promoting digital technology development indirectly foster blockchain as an emerging technological infrastructure. Nevertheless, the absence of a comprehensive legal framework governing blockchain technology, smart contracts, and digital assets remains a significant barrier, causing many enterprises to remain at the pilot or experimental stage and slowing market expansion, particularly in the enterprise segment. Overall, Vietnam's blockchain market is in a growth phase but remains unstable, reflecting the characteristics of an emerging technology market: rapid growth, high sensitivity to policy environments and global trends, and substantial development potential if supported by coherent strategies and a consistent regulatory framework.

4.1.3. Current status of blockchain technology adoption in the enterprise and public sectors since 2019

According to Decision No. 749/QĐ-TTg, blockchain is identified as a foundational digital technology serving the development of the digital economy and digital society, with a role in enhancing transparency, ensuring data integrity, and improving public governance efficiency. However, to date, blockchain adoption in both the public and enterprise sectors has largely remained at the stages of research and pilot implementation, without widespread integration into core operational systems and services. This indicates a notable gap between policy orientation and actual implementation.

4.1.3.1. Current status of blockchain adoption in the enterprise industry

From 2019 to the present, Vietnamese enterprises have gradually adopted blockchain technology; however, implementation has primarily been limited to pilot projects or small-scale deployments rather than full-scale integration across value chains. Blockchain has been most widely applied in traceability and supply chain management, particularly for agricultural and food products for export, while in logistics and e-commerce, it has mainly served as a supporting tool for data management and transaction authentication. Overall, blockchain adoption in the enterprise sector remains largely auxiliary in nature, constrained by the lack of a clear legal framework, technical standards, and specialized human resources.

4.1.3.2. Current status of blockchain adoption in the public industry

Blockchain adoption in Vietnam's public sector since 2019 has proceeded cautiously, primarily through research and pilot initiatives aligned with the national digital transformation strategy under Decision No. 749/QĐ-TTg. The

technology has been deployed mainly in areas with high requirements for data authentication and transparency, such as administrative record management, academic certificates, and traceability systems, functioning as a "trust layer" that supports existing information systems. Nevertheless, the scope of implementation remains limited, and blockchain has yet to become a core digital infrastructure due to the absence of a comprehensive legal framework, unified technical standards, and adequate human resource capacity.

4.2. RESEARCH FINDINGS ON FACTORS INFLUENCING THE INTENTION TO ADOPT BLOCKCHAIN TECHNOLOGY IN E-COMMERCE IN VIETNAM

4.2.1. Descriptive statistical results

Data were collected through both offline and online surveys from 466 respondents with professional experience in B2C e-commerce enterprises in Vietnam, operating across e-commerce platforms, corporate websites, and social media platforms. Screening questions were employed to ensure the relevance and appropriateness of the respondents. The descriptive statistical results indicate that the sample exhibits a well-balanced structure in terms of gender, age, and work experience, accurately reflecting the characteristics of a young, dynamic workforce with an increasingly professional level of participation in the e-commerce sector. In terms of industry distribution and firm size, the sample is predominantly concentrated in fast-moving consumer goods, beauty, fashion, and micro and small enterprises, which is consistent with the actual development patterns of Vietnam's e-commerce market. Accordingly, the collected data demonstrate a high level of representativeness and reliability for subsequent quantitative analyses.

4.2.2. Quantitative analysis results

4.2.2.1. Reliability assessment of measurement scales using Cronbach's Alpha

The preliminary reliability assessment indicates that, after removing four observed variables that failed to meet the acceptable thresholds and re-estimating the model, the remaining 11 constructs comprising 35 observed variables satisfy the reliability requirements. These scales are therefore deemed suitable for inclusion in the subsequent Confirmatory Factor Analysis (CFA).

4.2.2.2. Measurement model assessment using Confirmatory Factor Analysis (CFA)

The CFA results demonstrate that all constructs achieve adequate reliability and convergent validity, as composite reliability (CR) values exceed the 0.7 threshold, average variance extracted (AVE) values are greater than 0.5, and standardized factor loadings of all observed variables exceed 0.5. These results indicate a high level of internal consistency and conformity with established

theoretical standards. In addition, discriminant validity is ensured as the maximum shared variance (MSV) is lower than AVE, the square root of AVE exceeds the inter-construct correlation coefficients, and the correlation estimates are significantly different from unity. Collectively, these findings confirm that the constructs in the model meet the necessary conditions for Structural Equation Modeling (SEM) analysis (Anderson & Gerbing, 1988).

4.2.2.3. Structural Equation Modeling (SEM) results

After the measurement model achieved an acceptable fit through CFA, the validated observed variables were entered into the structural model to test the research hypotheses using SEM with AMOS 21.0. The SEM results indicate that the theoretical model exhibits a good fit with the empirical data, as key fit indices (CMIN/df, TLI, CFI, RMSEA) fall within acceptable thresholds. All eleven hypotheses are supported at the 95% confidence level, with all structural relationships demonstrating positive effects. Moreover, the relative magnitudes of the factors influencing blockchain adoption intention are identified, thereby confirming the theoretical consistency of the proposed model and directly addressing the research objectives within the Vietnamese e-commerce context.

4.2.2.4. Moderating effect of government support on the relationship between technological readiness and blockchain adoption intention

The analysis of the moderating role of government support on the relationship between technological readiness and blockchain adoption intention reveals that both technological readiness and government support exert positive direct effects on the intention to adopt blockchain technology. However, the interaction effect is negative, indicating a weakening moderating role whereby higher levels of government support attenuate the relationship between technological readiness and adoption intention. This finding suggests that existing policies primarily stimulate short-term adoption intentions by reducing institutional uncertainty, rather than strengthening the internal technological capabilities of e-commerce enterprises. Consequently, to promote sustainable blockchain adoption, public policy should shift its focus from external environmental support toward systematic investment in enterprises' technological resources, human capital, and data infrastructure.

4.2.2.5. Hypothesis testing results

Based on standardized SEM estimates and moderation analysis conducted using PROCESS Macro 4 (SPSS), all hypotheses from H1 to H12 are supported, indicating that the proposed model possesses strong explanatory and predictive power. Perceived ease of use (PEU) and perceived usefulness (PU) exert positive effects on blockchain adoption intention, with PEU demonstrating a stronger dominant influence, consistent with the Technology Acceptance Model (TAM) and further reinforced by in-depth interview evidence.

Core technological factors, including technological readiness, traceability capability, cost savings, data privacy protection, partner pressure, and trust, exert either direct or indirect effects on perceived ease of use, perceived usefulness, and blockchain adoption intention. These results reflect the multidimensional nature of blockchain adoption decisions in e-commerce and are also consistent with insights derived from qualitative interviews. Notably, technological readiness not only exerts a strong direct effect on adoption intention but also serves as a foundational determinant shaping perceptions of usefulness and ease of use of blockchain technology. The R^2 values indicate that the model explains 49.5% of the variance in PEU, 42.9% in PU, and 48.7% in adoption intention (IB), thereby demonstrating a relatively high level of explanatory power in the Vietnamese research context.

A key novel finding of this study is the negative moderating effect of government support on the relationship between technological readiness and blockchain adoption intention, implying that current policy instruments in Vietnam tend to stimulate short-term adoption intentions rather than enhance firms' internal technological capabilities. Overall, the combined quantitative results and in-depth interviews indicate that blockchain adoption in Vietnam's e-commerce sector simultaneously depends on internal technological foundations, perceived technological value, and the broader institutional and market-relational context.

Chapter 5
ORIENTATIONS AND POLICY IMPLICATIONS TO STRENGTHEN THE IMPACT OF DETERMINANTS ON BLOCKCHAIN ADOPTION INTENTION AMONG E-COMMERCE ENTERPRISES IN VIETNAM

5.1. PERSPECTIVES, OBJECTIVES, AND DEVELOPMENT ORIENTATION FOR BLOCKCHAIN APPLICATION IN E-COMMERCE IN VIETNAM FOR THE PERIOD 2025 –2030 WITH A VISION TO 2050

5.1.1 Global and National Trends in Blockchain Technology Development

- **Global trends in blockchain technology development**

The trend toward institutionalization and legal standardization of blockchain technology is becoming increasingly evident in advanced economies. The United States has taken the lead in driving technological convergence, particularly the integration of blockchain technology with artificial intelligence (AI). Asian economies have emerged as major centers for large-scale blockchain applications. The adoption of blockchain technology in global e-commerce is increasingly becoming a central axis of development. At the same time, emerging technological trends are reshaping the global blockchain ecosystem.

At the global level, blockchain technology has transitioned from a phase of high expectations to one of practical implementation and is increasingly recognized as a foundational digital infrastructure of the digital economy. Many countries and international organizations regard blockchain as a key instrument for restructuring transaction models, data governance, and market operations, particularly in e-commerce, digital finance, and public administration. The trend toward institutionalization and legal standardization of blockchain technology has become more pronounced, exemplified by the European Union's Markets in Crypto-Assets (MiCA) regulatory framework, which establishes cross-border regulatory standards.

Countries such as France and Germany play a central role in linking blockchain with Industry 4.0, digital supply chains, and e-commerce, reflecting an institutional-constructive approach to governance. Meanwhile, the United States leads the trend of convergence between blockchain and artificial intelligence, where blockchain functions as a "trust layer" for automated systems and data-driven decision-making. In Asia, China and South Korea have emerged with large-scale blockchain application models, treating blockchain as public infrastructure for e-commerce, logistics, and digital consumer protection.

Globally, e-commerce has become a focal application domain for blockchain technology, aimed at addressing issues related to authentication, transparency, traceability, and cross-border payments. Concurrently, emerging trends such as cross-chain interoperability, asset tokenization, and sustainable blockchain solutions are reshaping the blockchain technology ecosystem. Overall, blockchain is shifting from isolated technological experimentation toward the construction of institutional infrastructure and ecosystem-based applications. International experience indicates that blockchain can achieve its full potential only when it is coherently integrated with public policy, digital infrastructure, and national digital economy development strategies.

- **Trends in blockchain technology development in Vietnam**

In Vietnam, blockchain technology is transitioning from a phase of fragmented experimentation to one of institutionalization and strategic deployment, based on three core pillars: institutional completion, mastery of "Make in Vietnam" technological infrastructure, and the expansion of applications into real economic sectors, particularly e-commerce.

From an institutional perspective, blockchain has been established as a strategic digital infrastructure of the digital economy through major resolutions and decisions of the Communist Party and the Government. At the same time, the regulatory mindset is gradually shifting toward an "innovation-accompanying" model through the implementation of regulatory sandboxes and legal frameworks for digital assets.

In terms of technological infrastructure, Vietnam is promoting the development of domestic blockchain platforms aligned with data sovereignty and information security requirements, while simultaneously shaping a convergent technological architecture in which blockchain serves as a "trust layer" connecting AI, big data, and digital identity systems.

With regard to practical applications, e-commerce represents a key priority sector for blockchain deployment, with primary application directions including supply chain traceability and transparency, transaction authentication and smart contracts, as well as secure and compliant consumer data governance. In terms of human resources and international positioning, Vietnam is emerging as a promising destination on the global blockchain map, owing to its high level of technology acceptance, a young engineering workforce, and a growing ecosystem of education and innovation. These factors provide a foundation for blockchain to become an effective instrument in promoting a transparent, secure, and sustainable e-commerce ecosystem.

5.1.2. Blockchain technology development from the perspective of the Party and the State

According to Resolution No. 52-NQ/TW and the Documents of the 13th National Congress of the Communist Party of Vietnam, proactive participation in the Fourth Industrial Revolution is identified as a strategic task in which blockchain technology is classified as a key priority technology for development. Blockchain is positioned as an important instrument for modernizing state governance and enhancing transparency, accountability, and efficiency in socio-economic management.

To operationalize this orientation, the government promulgated the National Strategy on Blockchain Application and Development to 2025, with orientations toward 2030 (Decision No. 1236/QĐ-TTg), aiming to gradually master blockchain technology and develop "Make in Vietnam" platforms. The strategy emphasizes the development of autonomous blockchain infrastructure, the promotion of "blockchain+" models, and the integration of blockchain into various sectors and fields, including e-commerce.

In parallel, the State places strong emphasis on improving the legal corridor, developing regulatory frameworks for digital assets and cryptocurrencies, and implementing sandbox mechanisms to both mitigate risks and encourage innovation. In the context of green transformation and circular economy development, blockchain is regarded as a foundational digital infrastructure that enables supply chain transparency, traceability, and emissions management in e-commerce. Blockchain adoption contributes to strengthening consumer trust, supporting enterprises in meeting sustainability standards, and participating more deeply in global value chains. Furthermore, blockchain facilitates the digitalization

of logistics, carbon credit management, and the promotion of low-carbon business models associated with e-commerce. Overall, the Party's and the State's orientation toward blockchain development reflects an integrated approach combining technology, market mechanisms, and public policy, positioning blockchain as a key driver supporting Vietnam's simultaneous pursuit of digital transformation, green transition, and long-term sustainable development.

5.1.3. The new context: convergence of market dynamics, public governance innovation, and national strategic orientations for e-commerce development

E-commerce in Vietnam is growing rapidly but increasingly reveals issues of fraud, counterfeit goods, data security, and lack of transparency in the supply chain, undermining consumer trust and increasing regulatory pressure. In that context, along with the strategic direction of the State establishing blockchain as a core digital infrastructure, the convergence of market demand, management requirements, and national policy has created a foundation for the application of blockchain to enhance the safety, transparency, and sustainability of the e-commerce ecosystem.

5.1.4. State Governance Perspectives on Blockchain Application in E-Commerce in Vietnam for the Period 2025 –2030 with a Vision to 2050

- The viewpoint of state management on the application of blockchain technology in e-commerce in Vietnam from 2025 to 2030 and the vision for 2050: The state identifies blockchain technology as an important digital infrastructure in e-commerce management, contributing to increased transparency, traceability, and transaction verification. The management perspective reflects a shift from an administrative control model to governance based on data and technology while also emphasizing the role of creation, supporting innovation, and implementing controlled sandbox mechanisms. Blockchain is seen as a tool to enhance market management effectiveness, protect consumers, and ensure data security in the digital economy.

- The state management goals for the application of blockchain technology in e-commerce: In the period 2025 - 2030, the main focus is on building a legal framework, developing digital infrastructure, and gradually integrating blockchain into e-commerce management activities. In the long term, by 2050, the goal is to form a transparent and safe e-commerce ecosystem, in which blockchain plays a foundational role in connecting and ensuring trust among market participants.

5.1.5. Specific policy orientations for blockchain application in e-commerce

- Period 2025 - 2030: Perfecting the legal framework and controlled testing of blockchain technology application models in e-commerce Focusing on building the basic legal framework, implementing sandbox mechanisms, and developing

foundational digital infrastructure to create conditions for businesses to safely and controllably test and apply blockchain.

- Period 2030-2040: Expanding the application of blockchain technology and deeply integrating it into e-commerce management systems Enhancing data standardization and technical standards, expanding the application of blockchain and integrating it into management systems, and gradually transitioning to a real-time market monitoring model based on data.

- Vision for 2050: Perfecting the e-commerce management ecosystem based on blockchain technology and digital data Aiming to build an e-commerce ecosystem operating on a digital data platform, where blockchain plays the role of a trust infrastructure, supporting intelligent management and international integration.

5.2. GOVERNANCE AND POLICY SOLUTIONS TO PROMOTE BLOCKCHAIN APPLICATION IN E-COMMERCE IN VIETNAM FOR THE PERIOD 2025–2030 WITH A VISION TO 2050

5.2.1. Solutions from the Government and regulatory authorities

At the state level, promoting the application of blockchain in e-commerce should be approached as a central aspect of modern economic management, where the government plays the role of institutional creator, market regulator, and resource allocator, encouraging innovation while controlling risks. The policy focus is on perfecting the legal framework toward transparency, stability, and adaptability to new technologies while also implementing support tools such as financial incentives, tax policies, and controlled testing mechanisms (sandbox) to reduce initial investment costs and legal uncertainties for businesses.

In addition, the state needs to promote the development of a blockchain ecosystem and establish market standards to enhance connectivity and the dissemination of technology in e-commerce. The development of digital infrastructure and foundational data will contribute to enhancing resource utilization efficiency, improving competitive capacity, and promoting sustainable digital economic development.

5.2.2. Enterprise-level solutions to optimize resources and enhance blockchain application effectiveness

At the enterprise level, the application of blockchain needs to be identified as a strategic decision aimed at optimizing resources, reducing operational costs, and increasing long-term value in the context of competitive e-commerce and high demands for transparency and security. Businesses need to focus on raising awareness of technological value, enhancing technological readiness, and making appropriate investments in digital infrastructure.

Exploiting the benefits of blockchain, such as traceability, supply chain transparency, process automation, and cost control, will contribute to improving

governance efficiency and enhancing business performance. At the same time, pressure from partners and the market acts as a driving force for businesses to accelerate the learning process, strengthen technological trust, and expand applications in a substantial and sustainable manner.

5.2.3. Solutions for blockchain technology solution providers

Solution providers need to orient product development according to the practical needs of e-commerce businesses, with flexible, modular designs suitable for various levels of technological readiness. The system needs to be simplified and user-friendly to reduce technical barriers and enhance technology acceptance.

At the same time, blockchain solutions need to ensure effective integration with existing e-commerce platforms, payment systems, and logistics, thereby reducing costs and deployment time. Diversifying service delivery models (such as Blockchain-as-a-Service) combined with consulting, training, and technical support will contribute to enhancing application efficiency and expanding the market.

5.2.4. Solutions to enhance labor productivity and efficiency through blockchain application in e-commerce

Human resources play a central role in transforming blockchain technology into economic value in e-commerce. The competence, awareness, and technological trust of employes are decisive factors in the effective use of resources and the labor productivity of enterprises.

Therefore, it is necessary to focus on enhancing digital skills, technology adaptation capabilities, and awareness of the benefits of blockchain in order to reduce conversion costs, limit operational risks, and optimize practical application efficiency. At the same time, trust in the transparency and security of blockchain will promote a positive attitude and technology usage behavior, thereby enhancing governance efficiency and long-term economic effectiveness.

The effectiveness of blockchain application depends on the close linkage between the State, enterprises, and educational institutions, with workers playing a central role in receiving and realizing technological knowledge.

5.3. RESEARCH LIMITATIONS AND DIRECTIONS FOR FUTURE STUDIES

The research still has certain limitations related to the context and timing of the survey and the scale and scope of the research sample, as well as the range of analyzed variables. Therefore, the ability to generalize the results and assess the long-term impact of blockchain technology and supporting policies is not yet comprehensive.

In the near future, studies need to expand the scale and scope of samples, conduct longitudinal surveys to assess changes over time, and include variables related to operational efficiency, costs, innovation, and economic effectiveness. In

addition, it is necessary to enhance the analysis of policy impacts and research the integration of blockchain with other digital technologies such as artificial intelligence, big data, and IoT to clarify the role of technology in the sustainable development of e-commerce.

Chapter 5 defines the perspectives, objectives, and development directions for the application of blockchain technology in e-commerce (TMĐT) in Vietnam for the period 2025-2030 and the vision for 2050, based on domestic and international trends, while also inheriting the experimental results from Chapter 4.

This chapter also emphasizes the need to innovate state management in a constructive and technology-based manner, with blockchain as a tool to enhance market transparency and efficiency. Based on that, policy directions and a synchronized system of solutions from the state, businesses, technology providers, and human resources are proposed to promote the application of blockchain in e-commerce. Finally, the chapter points out the limitations of the research and proposes directions for future research, serving as a basis for refining policies and developing sustainable e-commerce.

CONCLUSION

Vietnamese e-commerce is a pillar of the digital economy with high growth rates, but it is facing many challenges regarding trust, product quality, data security, and management efficiency, requiring new technological solutions like blockchain to move toward sustainable development and a circular economy. The thesis identifies the factors influencing the intention to apply blockchain in e-commerce, clarifying the regulatory role of government support on the technological readiness of businesses, thereby providing a scientific basis for policy planning and technology implementation.

The research results show that sustainability, perceived usefulness, and perceived ease of use directly impact the intention to apply blockchain; factors such as cost, security, traceability, partner pressure, and trust indirectly influence it through intermediary variables; technology readiness has both direct and indirect effects. Especially, government support (legal, incentives, technical, and training) plays a positive regulatory role, reinforcing the intention to apply blockchain in e-commerce businesses, implying the need to enhance synchronized support policies to promote effective implementation.

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