

The Application of Blockchain in Vietnam's Agriculture Products Supply Chain: A Systematic Literature Review and Directions for Future Research

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DOI: <https://doi.org/10.52403/ijrr.20220836>

ABSTRACT

The objective of the article is to analyze and evaluate the overview of research works related to Blockchain application in the agricultural products supply chain. The article uses qualitative research methods, a systematic literature review from previous national and international studies and directions for future research, as well as the research methods and theories being used in previous publication. On that basis, the article identifies research gaps and proposes further research directions to be carried out in the future.

Keywords: Blockchain, supply chain, Agricultural products, Vietnam

1. INTRODUCTION

Blockchain is a new technology and has an urgent role in making food traceability easy, but it has not been applied by many Vietnamese businesses. The practice of blockchain adoption plays an important role in the global supply chain. This has prompted the birth of many studies examining the adoption of Blockchain technology by a business (Castro et al, 2020; Orji et al, 2020; Khummer et al., 2020; Barnes III & Associates). Xiao, 2019; and Kühn et al., 2019). In general, most studies confirm that the characteristics of the industry and supportive policies of the

Government are important factors affecting the adoption of Blockchain technology. At the same time, awareness of Blockchain technology is one of the factors influencing the adoption of this technology (Clohessy & Acton, 2019). Not only that, a number of studies have shown easy verification of transactions, accuracy and reliability of data, as well as reduced costs of influencing decisions through an organization's Blockchain technology (Loklindt et al, 2018; Mohammed et al, 2019; Hoxha & Sadiku, 2018). In fact, several authors have shown that scaling enterprise assets is a significant driver of Blockchain technology implementation (Xiong Feng et al, 2020).

Around the world, a number of studies have shown the barriers and factors that promote the intention to apply blockchain in the supply chain. Mathivathanan & associates (2020) have compiled from reputable scientific articles and research articles to present 9 main groups of barriers to the application of blockchain in the supply chain. Research by Boutkhoul et al (2021) based on TOE theory provides a model of the impact of barriers related to technology, organization, and environment affecting the decision to apply blockchain to sustainable supply chains. In Morocco. According to Mahtab Kouhizadeh et al (2021), technology and supply chain barriers are the

ones with the highest level and may require special attention, this finding coincides with the results of Boutkhoum et al (2021).

In Vietnam, agricultural products are one of the main export industries. The year 2020 and the first months of 2021 are a difficult time for the world economy and Vietnam cannot avoid heavy impacts, especially on our country's import and export activities. However, the total export turnover of our country in 2020 still reached an impressive number. Agricultural products are an outstanding export item in Vietnam's total export turnover over the past time, setting a new record with export value reaching \$41.2 billion in 2020 and \$22.83 billion in the first five months of 2021. It is an amazing result of Vietnamese farmers and businesses who have tried their best to seize every opportunity, even the smallest, to bring our country's agricultural products to the world in a very difficult situation due to the Covid epidemic -19.

However, besides many achievements, in fact, the tightening of traceability information requirements and traceability labeling regulations for exported agricultural products causes many difficulties and becomes a barrier for exporting the Vietnamese goods to markets such as China, the US, the EU... Not only that, even the domestic market requires consumers to provide product information sources in a manner Transparency is also being put in place to ensure the safety and quality of goods and protect the health of consumers. Therefore, the issue of traceability has become a "hot" issue not only in the export aspect. The application of product traceability in the supply chain (blockchain technology) to agriculture will contribute to raising the value and positioning of Vietnamese agricultural products in the international market.

In Vietnam, there is a study on the factors affecting the application of Blockchain in supply chain management among companies based in Ho Chi Minh City by Nguyen & Nguyen (2021). Performance expectations have the strongest indirect

impact on behavioral intentions, followed by infrastructure conditions, technology readiness, and effort expectations. However, there have been no studies analyzing the factors affecting the intention to apply Blockchain technology in the export supply chain of agricultural products in Vietnam. Therefore, the study and assessment of factors affecting the intention to apply Blockchain technology in the supply chain of Vietnamese agricultural exports is very necessary, both in theory and in practice. To conduct this study, the authors conducted an overview study on the application of Blockchain in the supply chain of agricultural products in Vietnam to point out research gaps and directions for further research to be carried out.

2. RESEARCH METHODOLOGY

Systematic Literature Review

With the goal of providing an overview of the research conducted and published on the topic related to Blockchain application in the agricultural products supply chain, the author undertook a systematic review. This study, in particular, employs a qualitative research technique to provide a broad understanding of Blockchain, as well as the research methods and theories being used in previous publications.

2.1 Search procedure

Multiple approaches were used to identify and categorize relevant articles during the review process. The author started by conducting a manual search and filtering of articles related to Blockchain. Through a process of manually checking keywords, article titles and abstracts to identify relevant articles, the author obtained a list of typical relevant articles.

The main databases were Scopus, Elsevier Science Direct, and PubMed. Keywords used in search included Blockchain related terms or variations to maximize reach, including "blockchain", "blockchain application", "agricultural supply chain".

In addition, the author expanded the search by reviewing the reference list of the

Blockchain papers discovered in the previous step, which is also known as the Backward and Forward Reference Searching method (Johnson & Jaramillo, 2017).

2.2 Inclusion criteria

After that, all articles are further evaluated based on the following criteria:

First, international articles must be published in peer-reviewed journals to assure quality and increase research results' reliability. For studies in Vietnam, the scope was broadened, including certain articles from non-reviewed journals because of their significant impact in this sector in Vietnam. Second, this paper focused on evaluating empirical studies, theoretical studies were eliminated in order to prioritize topic flexibility while researching in different aspects and contexts, as well as to assure high objectivity of research results.

2.3 Evaluation methods

After the above process of searching and selecting, relevant articles were synthesized and categorized into two perspectives: Article on blockchain in general and article on the application of Blockchain in agricultural supply chain. All of them are arranged in chronological order to present the growth of Blockchain in countries around the world. Then, the author outlines a few key factors that are considered to have a great influence on the application of Blockchain in the agricultural supply chain. From there, the author identifies the issues, levels, and scopes raised in relevant works, points out research gaps in previous research, and proposes some future research directions in the specific context of Vietnam.

3. LITERATURE REVIEW

3.1 Research on the supply chain of agricultural products

Cunningham (2001) scrutinized 123 peer-reviewed peer - reviewed journal articles published between 1987-2000 in seven commercial databases on the topic of

agricultural supply chain management and found that the ability to carry out additional studies on all agricultural supply chain processes, especially the fisheries sector. Vasileiou and Morris (2006) performed a descriptive study based on primary data collected through exploratory interviews with 240 potato growers, 17 potato dealers and 4 concurrent potato retailers. Analyze data using non-parametric statistical tools. The results show that all supply chain participants are extremely interested in maintaining their business and achieving comparative advantage and economic, market, social and environmental factors, schools have a major influence on these efforts.

3.2 Research on Blockchain application

Studies on the factors affecting the intention to apply Blockchain technology to business models of enterprises have been conducted widely in many countries around the world. The adoption of Blockchain technology brings a significant change to the internal and external workings of a business. Therefore, the organization through blockchain technology has received considerable attention from researchers. They took a deterministic approach to test the enterprise adoption of Blockchain technology. This approach assumes that an organization's intention to adopt blockchain technology is influenced by certain factors. Castro et al (2020) investigated the adoption of Blockchain technology in the wealth and wealth management industry in South Africa. They find that relative advantage, computing power, complexity, enabling technology environment, industry characteristics, and regulations are the main determinants of organizational adoption of technology. Blockchain.

Orji et al (2020), Khummer et al (2020), Barnes III & Xiao (2019), and Kühn et al (2019) evaluated the factors affecting the adoption of blockchain technology in the logistics industry. . They identified that the availability of specific blockchain

technology tools, infrastructure, policy, and government support were key factors for the adoption of Blockchain technology.

Sim et al (2014) and Kouhizadeh et al (2021), Ghode et al (2020), and Kalaitzi et al (2019) investigated the application of Blockchain technology to the supply chain industry. They found relative advantages, complexity, upper management support, cost, market dynamics, competitive pressures and regulatory support as influencing factors.

Clohessy & Acton (2019) found that Blockchain technology awareness, senior leadership support, and organization size influence Blockchain technology adoption in Ireland.

Loklindt et al (2018), Mohammed et al (2019), Hoxha & Sadiku (2018) investigated the application of Blockchain technology to various industries including transportation and land records management. They point out that easy verification of transactions, accuracy and reliability of data, and reduced costs of influencing decisions through an organization's blockchain technology.

Panicker & Kulkarni (2016), Koster & Borgman (2020) mentioned that company scope, culture of learning, senior management, customer readiness, competitive pressures and government policies influence the adoption of Blockchain technology in banking and the public sector. Furthermore, Albrecht et al (2018) studied the post-decision period of the adoption of Blockchain technology. They found that market power, regulation, transaction speed, transparency and cost, security, and interoperability are prominent factors influencing the implementation of Blockchain technology in the energy sector.

According to Davis et al. (1989), attitude is a strong predictor of behavioral intention. Lou & Li (2017) have shown that attitude is the most important predictor of intention to adopt Blockchain technology. Similar results have been confirmed by several other scholars (Kamble et al, 2019 Albayati et al., 2020; Ghode et al., 2020). Several scholars (Folkinshteyn & Lennon, 2016; Jaoude &

Saade, 2017; Knauer & Mann, 2019; Nuryyev et al, 2020) found that perceived usefulness positively influences intention to adopt Blockchain technology. Nuryyev et al (2020) emphasized that ease of use positively affects attitudes towards Blockchain adoption. In the context of Blockchain, several scholars (Kamble et al, 2019 Nuryyev et al, 2020; AlSuwaidan & Almgren, 2020) have shown that perceived usefulness is a strong predictor of attitude will apply Blockchain technology. Ease of use can be considered a related factor promoting technology use, and has been shown to reduce perceived effort (Hong & Cho, 2011). Results from previous research have shown a significant impact of ease of use on perceived usefulness (Kleijnen et al., 2004). Indeed, ease of use positively influences perceived usefulness as technologies that require less effort can be perceived as more useful (Karahanna & Straub, 1999; Gangwar et al, 2015). Also in the Blockchain context, several scholars (Kamble et al, 2019) have demonstrated this relationship. Karamchandani et al (2020) have shown that perceived benefits positively influence the perceived usefulness of Blockchain. Therefore, it can be inferred that perceived benefits positively influence perceived usefulness as well as user attitudes and intentions in adopting Blockchain technology.

Orji et al (2020) based on the theoretical framework of context - technology - environment (TOE) and applied Analytical Network Process (ANP) to investigate the practical application of blockchain technology in logistics industry freight forwarding of Nigeria. The study identified "availability of specific Blockchain tools", "infrastructure", "government policy and support" as the 3 most important and ranked factors affecting Blockchain adoption in freight logistics, in addition, includes the following groups of factors: "Complexity, ease of testing and observation, perceived benefit, compatibility, security, and privacy investment (technology factor); The presence of training facilities, top

management support, company size, human resource capacity, perceived investment costs, organizational culture (organizational factors); Competitive pressure, organizational trust, market instability, stakeholder pressure (environmental factors)". Collect data from 20 managers from 2 Logistics companies with a minimum of 5 years of experience in the freight logistics sector of Nigeria (De et al, 2018). Specifically, an assessment of the factors influencing the adoption of blockchain technologies revealed that the availability of specific blockchain tools ranks highest. Next in the tech scene is infrastructure. Infrastructure is an important factor influencing the adoption of blockchain in the logistics industry, ensuring modern technologies are supported and can meet modern infrastructure requirements. Government policy and support (institutional factors) is an influential factor in this context and requires the ability of relevant government agencies to provide support and enact rules and regulations intended to encourage blockchain adoption in the logistics industry. Currently, government legislation remains unclear on blockchain usage and adverse policies enacted against Bitcoin are a concern for markets and institutions that could affect widespread usage more widely than blockchain technology (Saber et al, 2019).

XiongFeng et al (2020) collected data from 50 listed Blockchain enterprises in China and quantitatively analyzed the impact of Blockchain implementation on business viability. Research has shown that scaling enterprise assets is a significant driver of blockchain technology implementation. The results show that total enterprise asset size is the most important factor and has a significant positive impact on Blockchain implementation. Especially for the same type of business, large-scale enterprises tend to apply Blockchain technology. In addition, this study demonstrates that the implementation of blockchain technology has a positive impact on improving asset

turnover ratio and reducing cost of sales ratio. Assets and employees are the most basic units of business operations. Employees are represented by the total number of employees of the business. Assets are the total assets that a business owns or controls. They play an important role in business operations. From that point of view, costs, an increase in the number of employees, and the size of assets affect a business' operating costs and its ability to function. And the implementation of Blockchain technology has actually led to a positive impact in improving the operability of the business.

Baidyanath Biswasa et al (2019) developed a model to examine the barriers to successful adoption and deployment of blockchains in various industries and services, using the DEMATEL technique. Barriers included: scalability challenges, market-based risks, transaction-level uncertainties, technology risks, high sustainability costs, poor economic behavior in the long term, the risk of cyber-attacks, legal and regulatory uncertainties. Research has shown that scalability challenges and market-based risks are the barriers that affect the most. Meanwhile, high sustainability costs and poor economic behavior are the most influential barriers to successful blockchain adoption. Research has shown the impact of barriers from high to low: the challenge of scalability; transaction-level uncertainty; market-based risk; laws and regulations; uncertainties; technology risks; cyber-attack risk.

3.3 Research on the factors of applying Blockchain in the supply chain

For managers, the application of any technology to the supply chain needs to consider barriers as well as driving factors promoting technology adoption. The application of Blockchain technology is no exception to that task. To clarify, more specifically, the barriers and factors that promote the intention to apply Blockchain in the supply chain, there are many domestic and foreign research projects that have gone

into analysis of the application of advanced technology. This development provides solutions and directions for businesses.

Mathivathanan & associates (2020) have compiled from reputable scientific articles and research articles to present 9 main groups of barriers to the application of blockchain in the supply chain: unwillingness of goods managers initialization, unfamiliarity of the technology, data security concerns, regulatory uncertainty, technology infeasible, complexity to set up or use, uncertain benefits, dependence on blockchain operators, lack of cooperation between partners in the chain. Among them, barriers are grouped as the most important barriers are unfamiliarity with technology and unclear benefits. In contrast, the barriers of top management unwillingness and dependence on blockchain operators are the barriers that have the least influence on the decision to adopt blockchain.

Research by Boutkhoum et al (2021) based on TOE theory provides a model of the impact of barriers related to technology, organization, and environment affecting the decision to apply blockchain to sustainable supply chains in Morocco. Technological barriers include: lack of scalability and system speed, availability of specific blockchain tools, complexity of blockchain-based system design, data security concerns and privacy. Environmental barriers include: government policy and support, high sustainability costs (energy consumption and resource depletion), challenges in integrating sustainable practices and blockchain technology through supply chain management. Finally, organizational barriers include: chain management stakeholders' disapproval of blockchain, support from top management and personnel capacity, and lack of new organizational policies for blockchain adoption. After calculating the priority of the barriers, the research has shown that the group of environmental barriers receive the highest priority, followed by technological and organizational factors. This explains

that the decision of the organization's decision-makers is more important than technological or governmental barriers.

According to Mahtab Kouhizadeh et al (2021), based on the TOE Technology - Organization - Environment framework and force field theory, this study was set out to examine the relationship between the barriers to adoption of Blockchain technology through two streams of opinions of experts and practitioners. Technological topics include: security challenges, access to technology, negative perception of technology, challenges of immutability of Blockchain technology, immaturity of technology. Organizational barriers include: limited financial resources, lack of commitment and supportive management, lack of new organizational policies for using Blockchain technology, lack of knowledge and expertise, difficulty in changing culture organization, hesitant to switch to new systems, lack of tools for Blockchain implementation in sustainable supply chain. Environmental barriers (from a supply chain perspective) include: lack of customer awareness of sustainability and Blockchain technology, problems in communication and coordination in the supply chain, policy challenges disclosure among supply chain partners, challenges in integrating sustainability practices and blockchain technology through SCM, cultural differences among supply chain partners. Environmental (external) barriers include lack of government policy, market competition and uncertainty, lack of involvement of external stakeholders, and lack of industry involvement in adoption blockchain usage and ethical and secure practices, lack of rewards and incentives. The research results of the authors through the DETAMEL tool have shown that supply chain and technology barriers are the barriers with the highest level and may need special attention, this result coincides with results of Boutkhoum et al (2021). In addition, organizational barriers mediate the relationship between technological barriers and barriers coming from the supply chain.

Technological barriers and external barriers need to be addressed from the outset to reduce obstacles to Blockchain adoption.

Kuma et al (2021) reviewed relevant literature and integrated TAM - TOE - DOI model to show the relationship of five characteristics/contexts with eleven factors affecting the intention to apply. Blockchain application in the supply chain of SMEs in India. Of the 11 hypotheses, 8 are related to relative advantage, technology compatibility, complexity, technology availability, top management support, cost concerns, perceived utility and supplier support have a significant influence on the intention to adopt blockchain technology in the supply chain. In addition, hypotheses related to security concerns in the organizational context; perceived ease of use and regulatory support in the context of the environment are not significantly affected. Similarly, the study by Lai-Wan Sim et al (2020) focuses on investigating the effects of relative advantage, complexity, top management support, costs, market dynamics, pressure competition and support from regulation to blockchain adoption for operations and supply chain management among Small and Medium Enterprises (SMEs) in Malaysia. In particular, technological factors also directly affect organizational factors. The top four important considerations indicated by the research are competitive pressure, complexity, cost, and relative advantage while market dynamics, regulatory support, and upper management support are not significantly.

Researching on the factors affecting the intention to apply Blockchain technology for supply chain management in enterprises in Malaysia, the author Lai-Wan Sim et al (2020) has set out an expansion model based on the unified theory of acceptance and use of UTAUT technology.

As a result, two variables performance expectations, effort expectations and beliefs have no positive significance on behavioral intention. This finding deviates from the existing literature that suggests that

performance expectations and effort expectations are positively associated with behavioral intentions in the supply chain. Among the survey respondents in this study, the majority said they have no knowledge or are learning about technology (71.97%). It is possible that the lack of awareness and knowledge about Blockchain technology influenced respondents' judgment about the usefulness of the technology and the effort required to adopt the technology. Similarly, the variable trust is not significant in this study whereby data security and privacy are still challenges when using Blockchain technology (Mougayar, 2016) and although Blockchain is often linked consistent with immutability (Saber et al, 2019). Meanwhile infrastructure conditions, technology readiness, relationship with technology are said to be significant. The control variable named regulatory support also significantly affects the relationship between infrastructure conditions and behavioral intention but has no moderating significance between the variable technology readiness and intention determine behavior.

In the article on users' perception of Blockchain adoption in India, author Kamble et al (2019) proposed a research framework based on the combination of TAM technology acceptance theory, behavioral theory vi has a TRA plan and a TRI technology readiness index.

The results show that perceived usefulness, attitude towards Blockchain usage, perceived behavioral control, and subjective norms are related to the intention to implement Blockchain. However, insecurity was eliminated in the validation process, and discomfort in use was found to be an insignificant variable in the Blockchain implementation because it did not affect the perception of computation usefulness as well as perceived ease of use. This finding differs from previous studies that have looked at ease-of-use cognitive inhibitory discomfort (Dabholkar, 1996; Walczuch et al, 2007). However, Pattansheti et al (2016) showed similar results. Research also shows

that perceived ease of use affects perceived ease of use. This is consistent with most other studies (Amoako-Gyampah & Salam, 2004; Lee, 2009; Shih et al 2012; Kumpajaya & Dhewanto, 2015; Rajan & Baral, 2015; Bröhl et al., 2016). On the other hand, the effect of perceived ease of use on attitudes towards Blockchain usage was found to be insignificant. Our results further show that perceived usefulness has a significant influence on behavioral intention and are supported by the findings of many previous studies (Kumpajaya & Dhewanto, 2015; Rajan & Baral, 2015; Bröhl et al., 2016). Subjective norm was found to have a negligible effect on behavioral intention but an effect on perceived usefulness. The effect of cognitive behavioral control on behavioral intention was again found to be insignificant.

Besides, the author team Queiroz & Wamba (2019) also has a study on Blockchain adoption behavior from an individual perspective in supply chain and logistics but in both India and the United States. The development model is based on technology acceptance models (TAM), unified theory of using UTAUT technology and network theory.

The model, after being tested using the total squares structural equation model (PLS-SEM), has obtained the results that performance expectations have a positive significance for Blockchain adoption behavior in both countries. India and the United States, this result is consistent with the results from the study of Oliveira et al (2014); Venkatesh et al (2012); Venkatesh et al (2003); Weerakkody et al (2013). On the other hand, social influence only positively affects behavioral intentions to adopt Blockchain in India and should not be significant in the United States. This finding indicates that there are differences in Blockchain adoption behavior between different countries according to the research and it also shows that in emerging economies, colleagues and family members have an important influence on behavioral

intention. In the same study, both infrastructure conditions were not positively related to the behavioral intention and expected behavior of Blockchain adoption in India but were found to be significantly positive when using data of the United States. In addition, blockchain transparency does not positively affect behavioral intentions to adopt Blockchain in both countries (India and the United States). Similarly, trust among supply chain stakeholders did not positively influence blockchain adoption intentions in any of the countries in the study. However, trust among supply chain stakeholders has positively influenced expectations for Blockchain adoption in India and behavioral intentions have positively influenced expectations for blockchain adoption behavior towards Blockchain adoption in both India and the United States.

In Vietnam, two authors Nguyen & Nguyen (2021) used a combination of the unified theory of acceptance and use of UTAUT technology and the TOE Technology - Organization - Environment framework to study the factors affecting the application of Blockchain in supply chain management among companies based in Ho Chi Minh City.

Findings show that 7 out of 9 hypotheses are significant, namely the effect of performance expectations, effort expectations have a positive influence on behavioral intention (this result coincides with research by Sim et al (2020), Queiroz & Fosso Wamba (2019) and the influence of performance expectations, effort expectations, technology readiness and infrastructure conditions on the trust variable (fits). This is consistent with the study of Kaiumv et al. (2019). Besides, the mediating effect of the intermediate variable has also been tested using the indirect effect. The results show that performance expectations have the strongest indirect effect on behavioral intention, followed by infrastructure conditions, technology readiness, effort expectations. This paper shows that there is a negligible influence of

the conditioning variable. This result is in contrast to previous studies by Sanmukhiya (2020); Sim et al (2020) both found a significant positive effect of weightlifting conditions of intention to use Blockchain. Similarly, the attitude technology readiness variable also has a negative effect on the behavioral intention to use Blockchain technology and does not coincide with the previous study of Alkhater et al (2018); Sim & associates (2020).

3.4 Research on factors applying Blockchain in the supply chain of agricultural products

Within the scope of Vietnamese research groups, the number of research groups choosing the topic "Blockchain application factors in the agricultural product supply chain" is still very limited. The studies on the factors of applying Blockchain in the agricultural supply chain are mostly of international scope.

The research results show that the Blockchain system in the agricultural supply chain is used for traceability, sustainable consolidation of management, production of agricultural products and food, and information security. Yadav & Singh (2019) conducted a survey on the application of blockchain research in agriculture.

The authors find that blockchain adoption is still an arduous initial phase and classified based on the existing blockchain has been studied under four aspects, namely traceability, architecture, in the system forming, and other applications.

Tian (2017) supports the idea of combining blockchain for food safety with RFID. Furthermore, Tian (2017) has introduced a traceability mechanism in the agricultural supply chain using blockchain and IoT. Yadav & Singh (2019) proposed a framework to address selected farmers issues in the Indian context using blockchain-based mobile apps.

Several studies suggested blockchain trends in agricultural supply chains and discussed some of the challenges facing its adoption.

These challenges include lack of government sanctions, lack of sustainability, lack of training and education platforms, etc. Since the blockchain-based system has no control over the sensors through which the data transmitted is made available to the blockchain system, if those sensors are manipulated, it will be very difficult to catch unauthorized transactions or authenticity of origin.

Other challenges for blockchain adoption in agricultural supply chains include lack of skilled workforce, system storage capacity, scalability, privacy concerns, and high costs.

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The authors believed that such a mechanism would be authentic, tamper-proof, and would provide absolute rights of ownership. The authors also discuss the major challenges facing blockchain-based mechanism implementation- isms as a high initial investment, instability and security and other related issues.

The study was conducted and implemented with three main elements. First and foremost, the proper cooperation of the stakeholders helped to rationally define and enrich the subject matter with novelty. Second, it is the integrated research methods that complement each other to clarify the research problem. Third, is the application of the proposed methodology to develop countries that are major agricultural centers in the world and need Blockchain to ensure food hygiene and safety and transparent traceability.

4. CONCLUSION

In conclusion, studies on the factors affecting the application of Blockchain technology in the supply chain are very interested by domestic and foreign organizations, especially in major countries around the world. Regarding the factors affecting the intention to apply Blockchain technology to the business model of enterprises, the previous authors' approach is to assume that an organization's intention to adopt blockchain technology is affected by certain factors. Regarding the factors

affecting the application of Blockchain in the supply chain, the authors' approach is to synthesize and analyze from reputable scientific articles, research papers and previous theories to provide a reasonable model figure. These studies have not only theoretical value but also significant empirical value. However, the following research gaps cannot be avoided:

Firstly, when it comes to Blockchain technology, people often only mention its application in the field of finance, banking or information technology, but there are not many research papers on another important area is agricultural. Even with research, they do not combine into a general topic like the supply chain of agricultural products.

Second, there have been many studies on Blockchain and its impact on the supply chain at present, but in order to have a research paper directed to the agricultural industry, from farming to production to quality management and when exporting to foreign markets, the number of research papers is quite small and mainly they follow a narrow industry, not the advantage of Vietnamese agricultural products.

Third, the authors find that Vietnam is a powerhouse in agricultural products with the position of the world's leading food exporter. However, there has been no research to study the intention of applying Blockchain technology for Vietnamese enterprises to export agricultural products.

Fourth, there are currently a very limited number of research papers on Blockchain, especially in the agricultural supply chain in Vietnam that use the TAM-TOE model.

Thus, although some factors affecting the adoption of Blockchain technology have been highlighted in previous studies, they have only been mentioned in certain industries. In addition, these studies do not comprehensively reflect, and the scope of the research only focuses on certain fields, especially the application of this technology in the supply chain of agricultural export in Vietnam

Acknowledgement: None

Conflict of Interest: None

Source of Funding: None

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How to cite this article: Xuan Hung Nguyen, Thi Ky Phuong Do, Thi Ngoc Anh Nguyen et.al. The application of blockchain in Vietnam's agriculture products supply chain: a systematic literature review and directions for future research. *International Journal of Research and Review*. 2022; 9(8): 418-430. DOI: <https://doi.org/10.52403/ijrr.20220836>
