

The Foresight of Blockchain Technology in E-commerce in Kuala Lumpur and Selangor, Malaysia

Sabrina Goh Ming Jie¹ & Muhammad Ammar Shafi^{1*}

¹Department of Management and Technology, Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia, 86400 Batu Pahat, Johor, MALAYSIA.

*Corresponding Author

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Abstract: In the technology era, implementing blockchain technology in the industries are getting familiar and emphasized as the technology offers maximum convenience and security. The adoption of blockchain technology in e-commerce is still under observation along with its advantages and disadvantages. Several studies discussed blockchain technology, however, there is still very little research on the implementation of blockchain technology in the e-commerce industry. Hence, this study aims to investigate the key drivers and explore the future trends of blockchain technology in e-commerce in Kuala Lumpur and Selangor. The research respondents included the developers and users of blockchain technology and users of e-commerce. A mixed-method approach was used to collect both primary and secondary data. The STEEPV analysis is used to determine the issues and drivers related to implementing blockchain technology, while the SPSS software analyzes the data collected. A total of 88 out of 100 respondents participated in the survey. The survey response rate of the research was 88%. The outcomes of the study concluded the two top drivers based on their importance, impact, and uncertainty level, the digitalization and awareness of adopting blockchain technology. Then, the future trends of four scenarios were formulated with scenario building. This study may benefit future researchers, e-commerce industries, and users of blockchain technology as it provides various possibilities for enhancing the e-commerce processes.

Keywords: Foresight, Blockchain technology, E-commerce

1. Introduction

In the new global economy, technology is becoming advanced and useful, leading to the expansion of e-commerce businesses throughout the world and helps in boosting the development of the world's economies. (Barenji *et al.*, 2019). Recently, the implementation and adoption of blockchain technology

by industries are increasing rapidly. The involvement of blockchain technology in the industries can be very extensive supply chain, e-commerce, healthcare, energy, venture capital, and other relevant industries as its main function are to store data into its chains and provide security to the parties. Based on the research, there are over 50 big companies that explored the blockchain such as Samsung, Tencent, Amazon, Apple Inc, Facebook, and so on.

Statistics proved that the active use of internet service in Malaysia was up to 91% of the 30 million Malaysian population. E-commerce business is recognized by people nowadays because it provides a huge amount of information regarding the goods and services offered by both marketers and consumers. It also consists of various parties such as individuals, administration, information, and technology (Lin *et al.*, 2019). Based on the Statista report (2019), the contribution of e-commerce towards Malaysia's gross domestic product (GDP) was increasing rapidly for the past 5 years which is RM90 billion in 2015 to RM127 billion in 2019. Again, the Statista report did show the most common e-commerce sites that have been used by the Malaysian as of the fourth quarter of 2020 which are Shopee, Lazada, and PG Mall.

However, e-commerce fraud has always become the most critical problem and topic that has been focused on by the government and people. Zainuddin and Kaur (2020) claimed that the highest record for e-commerce scams in Malaysia happened during the Movement Control Order (MCO) period which is March 18 and June 30 by involving up to 2020 cases with the amount losses up to RM12.6 million. Likewise, Rahim *et al.* (2020) reported that the number of e-commerce fraud cases increased to 2500 cases and involved a total of RM17 million losses within 2 months from June to August 2020. Hence, it is important to improve the technology in e-commerce for enhancing the user's protection. When blockchain technology is implemented in e-commerce, it will guarantee all the parties that are involved in the process. For example, protecting personal information from cyber threats, cost reduction, and providing fast transactions, and so on. The blockchain was known as one of the best inventions which attracted people from different industries with its reliable structures. (Baygin *et al.*, 2019).

Blockchain technology was first introduced by a cryptographer called David Chaum in his dissertation in 1982 and continuously ran out the cryptographically secured chain of blocks by W. Scott Stornetta and Stuart Haber in 1991. In 2009, the first blockchain that acted as a public ledger for transactions was published by Satoshi Nakamoto for the use of Bitcoin. The blockchain was decoupled from the currency and its potential for other finance and inter-organizational transactions were investigated which is Blockchain 2.0 during 2014. Malaysia Blockchain Technology & Distributed Ledger Technology (DLT) Report 2019 stated that blockchain technology is known as a computer network that contains transaction data that is repeated across every node such as computers, smartphones, laptops, and so on in a system called a distributed ledger. According to Sanka *et al.* (2021), blockchain technology is a digital ledger of transactions that provides interconnection between blocks of data protected by cryptographic concepts against tampering.

The researchers further explained that the blockchain was categorized into 3 types including public, private, and consortium blockchain as every type of blockchain will play a role in different diversification of interests during the application of technology. Joshi (2020) described a public blockchain as suitable to be implemented in the public sector like the healthcare industry because it provided an open network where all the information was available to access by anyone and all of the parties able to read and write data on the blockchain. As the public blockchain was not under control by any participant and once data is recorded, modifying and deleting will not be approved. Therefore, it acted as a decentralized and immutable ledger. Next, a private blockchain is also known as a consortium blockchain by Joshi, it is a network that is attended by a single authority and requires permission or invitation by the entity before accessing the blockchain. The invited party will request viewing and recording data into the blockchain. The private blockchain enhances an individual's privacy, security, and performance in improving scalability since it will consist of a few layers of data access before reviewing the real data. This blockchain will normally exist in the organization with its departments for business process automation. Nevertheless, Geroni (2020) and Sanka *et al.* (2021) further argued that private blockchain and consortium blockchain are not the same although both of them are similar at some points. A consortium blockchain is placed between the public and private

blockchain. It consists of a few companies to access and authorize over the network which means the accessibility towards the ledger is not only limited to one organization like private blockchain but any one of the organizations that have been authorized.

The use of blockchain technology can prevent double-spending during the transaction by using public-key cryptography where every agent consists of its private key and a public key shared with the other agents (Ollerros & Zhegu, 2016). Liu & Li (2019) also mentioned that the core value of the technology is building transparency and public based on algorithms, developing a truthfulness network for ensuring high confidentiality during the transaction, and protecting the information in complex environments.

Yusoff *et al.* (2019) stated that e-commerce is the process of buying and selling the products and services where the whole intermediate process from advertising the products and services to providing after-sales services to the customer will be included. When blockchain technology is applied in e-commerce, every transaction will be clarified by the blockchain then recorded into the decentralized ledger (Chang *et al.*, 2019). Besides, the application of blockchain in e-commerce provides a decentralized online shopping platform that improves truthfulness by protecting users' personal information (Jiang *et al.*, 2019), user empowerment while minimizing the possibility of corruption (Bulsara, 2020).

According to Teoh *et al.* (2020), blockchain technology should be utilized in e-business as the growth of technology benefits the growth of internet usage, hence, consumers tend to purchase all their needs through online platforms. Therefore, it can be a risk of cybercriminals cases increasing once the databases without using blockchain technology and store a large amount of personal information has been leaked in the market.

The main advantage and attraction of blockchain technology is the decentralized system that allowed the share of the database without relying on the third-party company or central administrator that might increase the possibility of data leakage. A transaction using Blockchain will have its proof of validity and enforcement of authorization which means every action that has been done will be recorded and it will be not able to modify or delete. This may result in providing immutability, trusty, and transparency (Golosova & Romanovs, 2018). Blockchain technology was expected to be a set of businesses through the internet, and it believes that there will be potential in replacing the central banking platforms and other actions such as trades, healthcare (Woodside *et al.*, 2017). The blockchain also consists of high potential in the e-commerce industry that solves companies' short and long-term obstacles (Bulsara, 2020).

Meanwhile, blockchain technology can be expensive when every node will repeat a task with the aim of the agreement, and it can be resource-intensive as the application of the technology is complex to understand by a person which leads to unreadiness implementation (Sarmah, 2018). Conversely, Shanin (n.d) argued that blockchain in e-commerce helps to reduce the cost of maintaining the systems by combining all the processes such as transaction process, inventory management, and description and images of products with other business activities. Zheng *et al.* (2017) stated that blockchain technology can be bulky and delayed when the number of transactions increases because every transaction will need to be stored on the blockchain for verifying whether the origin of the current transaction had been spent.

Hence, blockchain technology has advantages and disadvantages with the number of issues and bridges that are not discovered which leads to uncertainty in the future of blockchain technology in e-commerce.

Therefore, to achieve the research objectives the key drivers in employing blockchain technology among e-commerce in Kuala Lumpur and Selangor are determined. Consequently, the future trends of blockchain technology among e-commerce in Kuala Lumpur and Selangor.

The foresight study was carried out keeping in view the time horizon of 5 years in the future or description other words from the year 2022 to the year 2027. A quantitative approach was taken in the study by using the questionnaires as the research instrument. This research was conducted in Kuala Lumpur and Selangor by involving both the developers and users of blockchain technology and users of e-commerce.

The study aims to benefit future researchers to identify the drivers and future scenarios in employing blockchain technology in e-commerce in Kuala Lumpur and Selangor. Besides, it also benefits the e-commerce company by reviewing and comparing the existing technology with the blockchain technology that it implies in the platform. Moreover, this study helps to guarantee the consumers' and buyers' welfare and concerns in using e-commerce.

2. Research Methodology

The purpose of this chapter is to indicate the research method that was adopted in the study. All Answer Ltd (2018) defined methodology as a technique to gather, organize and analyze the collected data. Gallagher again supported that a methodology is a group of processes, theories, and practices that help to assemble all the information globally. Methodologies include the research design and flowchart, research instruments, data collection, the method applied for the analysis process. It is important to have an appropriate method during data collection and data analysis to achieve the objectives. This chapter will start with the research design then continue with the research flow chart, data collection, the methods, foresight study, research instrument, pilot test, population, sample size and sampling method, the analysis of data, and lastly scenario building.

2.1 Research Design

A mixed-methods approach was conducted in this study. By applying the mixed-methods approach, primary and secondary data were collected during the study. The presenter further claimed that a comparison between both of the data is analyzed and more comprehensive data can be produced when this method is used in this study.

2.2 Data Collection

The two common types of data that have been applied in the research study are qualitative data and quantitative data. In this study, both qualitative and quantitative data were collected to meet the outcomes of the research questions and objectives. The tools that are used in the qualitative method are horizon scanning while the quantitative method is using the survey as the tool for data collection.

2.3 Data Analysis

Data analysis is a procedure of gathering and analyzing data to produce the research summary. The process aims to determine the related data for further decision-making. Hence, qualitative data will be collected through internet sources and quantitative data will be collected through survey form then STEEPV Analysis, Descriptive Analysis, Impact-uncertainty Analysis, and Scenario Building is used to analyze data.

(a) STEEPV analysis

The STEEPV analysis is a tool for the measurement and management of risk which offers an understanding of the environmental influence on the company and acted as a standard for decision making (Grima *et al.*, 2020). In this study, the trends, issues, and challenges were determined and classified into Social, Technological, Economic, Environmental, Political, and Values (STEPPV).

(b) Research instrument

In this quantitative study, a questionnaire is used as the method of the research instrument. The questionnaire is divided into 4 sections which included sections A, B, C, and D. Section A will explain

the demographic of participants such as gender, age, education, Section B will illustrate the drivers from STEEPV analysis and identify the important level of the driver towards the topic. Besides, the level of impact and the level of uncertainty in STEEPV analysis towards the topic will be asked in Sections C and D. A scale rating of 1 (Very Low) to 5 (Very High) was applied in sections B, C, and D.

(c) Pilot test

The pilot test is a procedure of pre-testing of the research instruments like a questionnaire (Van Teijlingen and Hundley, 2002). A total of 25 questionnaires has been distributed on social media like Facebook, WhatsApp, and Instagram for the pilot test purpose. Then, the results were analyzed by using SPSS software.

(d) Population and sampling

This research focuses on blockchain technology in the e-commerce industry in Kuala Lumpur and Selangor, hence the target population is included the developers and users of blockchain technology and users of e-commerce allocated at both of the targeted cities. By using the online resources to identify the population of respondents for the study, it was targeted a total of 100 respondents to participated in the data collection process. There are a total of 88 respondents participated and answered the questionnaire. As a result, the survey return rate for this study was 88%.

(e) Sampling method

Non-probability sampling is applied by using purposive sampling in this research. To fulfill the purposive sampling, the participants of the questionnaire must be those who are involved in blockchain technology or e-commerce and located in Kuala Lumpur and Selangor only.

(f) Descriptive analysis

In this study, the descriptive analysis was conducted through 'Statistical Package for Social Science' (SPSS) to identify the participants' information with the use of frequency and percentage and mean value for the respondent's perception towards the study.

(g) Impact-uncertainty analysis

After the analysis of data from SPSS software, an impact-uncertainty analysis was constructed by shortlisting the list of drivers based on their importance, impact, and uncertainty. The build of scenario analysis requires the involvement of the top two drivers that met the highest level of impact and level of uncertainty.

(h) Scenario building

To achieve the objectives of exploring the future trends of blockchain technology in e-commerce in Kuala Lumpur and Selangor required the process of scenarios building. In this research, the 2x2 method was used to form four different alternative scenarios by using the top two drivers from the previous step. Based on the four different alternative scenarios, the researcher can recognize the effects and possibilities of events in the future and the trends of the technology that might be the favorable or unfavorable results.

3. Literature Review

In this research, secondary data will be collected through journal articles, books, scholarly articles, websites, news, and some other related publications. By gathering the information from the resources, a horizon scanning was applied to merge the drivers that employ blockchain technology in e-commerce. The application of STEEPV analysis classified the drivers, factors, challenges, future trends, and threats that are appropriated with blockchain technology in e-commerce.

3.1 Table with Merged Issues, Trends and Challenges

There are a total of ten drivers that have been developed after the merging of the key term of issues, trends and challenges. These ten drivers are used for the aim of collecting data through the questionnaires. Table 1 shows the table of merged issues, trends and challenges.

Table 1: Table with merged issues, trends and challenges

No.	Issues, Trends, and Challenges	Drivers
1.	The acceptance in adopting the blockchain technology	Acceptance in adoption of blockchain
2.	The application of blockchain technology might cause the system migration occurs	System migration
3.	Public awareness may influence the chances of adopting blockchain technology	Awareness of adopting blockchain technology
4.	The internal and external barriers in adopting the blockchain technology	Barriers of blockchain adoption
5.	It required high investment in the application of blockchain technology	Investment in application of blockchain technology
6.	Lack of government policy restricted the development of blockchain technology	Government policy in blockchain
7.	The digitalization enhanced the implementation of blockchain technology	Digitalization
8.	The market demand acted as a stimulation to the company in the application of blockchain	Market demand
9.	The implementation of blockchain technology may be affected by the economic condition of a country	Economic condition
10.	The industrial revolution accelerated the application of blockchain technology in e-commerce	Industrialization

4. Results and Discussions

4.1 Demographic Profile

Table 2 illustrates the demographic profile of participants. Most of the respondents were female as compared with male respondents and almost all of them were users of e-commerce. Furthermore, the main consideration of the respondents in experiencing the e-commerce platform would be the concern of data privacy as half of the respondents think that the current technology in e-commerce is secure and there are still necessary for the implementation of blockchain technology in e-commerce.

Table 2: Demographic profile

	Frequency	Percentage (%)
Gender		
Male	18	20.5
Female	70	79.5
Total	88	100
Type of Advocates		
Developer of Blockchain Technology	18	20.5
User of Blockchain Technology	21	23.9
User of E-commerce	75	85.2
Security		
Security	18	20.5
Transparency	21	23.9
Traceability	41	46.6

Data Privacy	67	76.1
Others	0	0
Security Level in Experiencing the Current Technology in E-commerce Platform		
Very Insecure	1	1.1
Insecure	1	1.1
Neutral	22	25.0
Secure	52	59.1
Very Secure	12	13.6
Total	88	100
Necessity Level of Implementing Blockchain Technology in E-commerce Platform		
Yes	52	59.1
No	1	1.1
Maybe	35	39.8
Total	88	100

4.2 Mean of Drivers in Corresponding with Importance

Table 3: Mean of drivers on importance

No	Drivers	Mean
D1	Acceptance in adoption of blockchain	4.2841
D2	System migration	3.9886
D3	Awareness of adopting blockchain technology	4.3182
D4	Barriers of blockchain adoption	4.0682
D5	Investment in application of blockchain technology	4.1136
D6	Government policy in blockchain	3.9773
D7	Digitalization	4.3523
D8	Market demand	4.2045
D9	Economic condition	4.2614
D10	Industrialization	4.1932

Table 4: Mean of the 5 leading drivers on importance

No	Drivers	Mean
D1	Digitalization	4.3523
D2	Awareness of adopting blockchain technology	4.3182
D3	Acceptance in adoption of blockchain	4.2841
D4	Economic condition	4.2614
D5	Market demand	4.2045

Table 3 describes the mean value of drivers in terms of importance towards the blockchain technology in e-commerce in Kuala Lumpur and Selangor, Malaysia. Then, the top 5 leading drivers were formulated in table 4. The digitalization received the highest vote by the respondents with the mean value of 4.3523 while the market demand placed the least important driver towards the blockchain technology in e-commerce in Kuala Lumpur and Selangor, Malaysia.

4.5 Impact-Uncertainty Analysis

Table 5: Mean of the 5 leading drivers on level of impact and uncertainty

No	Drivers	Impact	Uncertainty
D1	Digitalization	4.2159	4.1477

D2	Awareness of adopting blockchain technology	4.1705	4.1591
D3	Acceptance in adoption of blockchain	4.1932	4.1477
D4	Economic condition	4.1250	4.0795
D5	Market demand	4.1136	4.1136

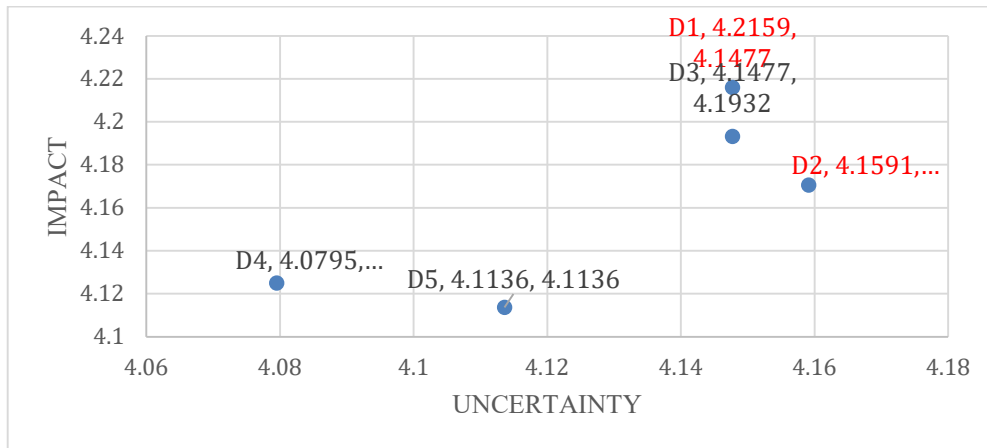


Figure 1: Impact-uncertainty analysis

Table 5 shows the mean of the 5 leading drivers on level of impact and uncertainty towards the blockchain technology in e-commerce in Kuala Lumpur and Selangor, Malaysia. The driver of the “digitalization” has the highest mean value in the level of impact contributed by the respondents which occupied 4.2159 while the driver that named with “awareness of adopting blockchain technology” has the highest mean value in the level of uncertainty towards the blockchain technology in e-commerce in Kuala Lumpur and Selangor, Malaysia. However, the driver of “market demand” consisted of the lowest mean value in both of the levels of impact and uncertainty which is 4.1136. An impact-uncertainty analysis is formulated in Figure 1 by using the scatter diagram to plot all the mean values and analyze the top two drivers with the highest impact and uncertainty. Thus, the top two drivers are used for the generation of scenario building in the next chapter.

4.6 Discussion

(a) Key drivers of Blockchain Technology among E-commerce in Kuala Lumpur and Selangor

The first research objective is to investigate the key drivers in employing blockchain technology in e-commerce in Kuala Lumpur and Selangor. As the main players in blockchain technology will be the developers and end-users, this causes the issues and drivers to be significant in verifying the application and diffusion of blockchain technology in e-commerce in the future. Hence, two top drivers which known as “digitalization” and “awareness of adopting the blockchain technology” are selected from the impact-uncertainty analysis and presented as the comparison of the most impactful and uncertain drivers.

The digitalization is defined as the most impactful driver in adopting blockchain technology in e-commerce because the industries in the 21st century are shifted from the revolution of industrial to domination of information technology. In this decade, it will implicate new normal in the business model, the interplay of stakeholders while extending the access of private information. This would enhance and emphasize the significance of ethical values and the roles of companies in the industry (Windsor, 2020). Furthermore, Murugiah (2021) reported that the e-commerce income of Malaysia rose to 17.1% year-on-year from RM238.2 billion to RM279 billion in the third quarter of 2021 and was mainly contributed by the industrial states like Selangor, Kuala Lumpur, Pulau Pinang, and Johor. This increment concluded that the Malaysian are adopting the new normal by making good use of the technology. The digital era is also driven by the user experience through actions, behavior, perception, and customer satisfaction. McKinsey's research shows that users in the digital age are concerned with

the functionality of an application, custom content delivered by companies, and high responsiveness to customer services (Stefanini,2018). Hence, the digitalization could be the most impactful factor in stimulating the introduction of blockchain technology in e-commerce.

Furthermore, awareness of adopting blockchain technology was the second-highest driver in terms of importance and acted as the most uncertain driver among the others. Most of the participants perceived that the driver would be the most uncertain and unpredictable for future development and the impact formed on the expectation of technology development. Kramer (2019) stated that blockchain technology was categorized as one of the latest technology advancements and it involved perceived benefits towards many firms in the industries and acted as a pushing force in improving the global economy, increasing public awareness such as e-commerce industries towards the implementation of blockchain technology in e-commerce for facilitating financial transactions while increased the efficiency of the process (Shanin, 2018). The awareness of technology trend by society and industries are related to the consciousness of the latest technology and the readiness in accepting the technology into the market, it also included the ability in recognizing while understand the perceived benefits provided by the technology. The awareness of technology can be described as either an occasion or a threat. The technology trend awareness was important and eager in producing opportunities for the young generation and increasing the technology development globally. However, to minimize the driver uncertainty and maximize the driver impact on future development, the related propaganda should be carried out. For instance, conducting documentary sessions and seminars by the government, sponsoring the intellectual properties, and generating a network between the experts and students (Muchiri, n.d).

(b) Future trends of Blockchain Technology among E-Commerce in Kuala Lumpur and Selangor

The second research objective aims to explore the future trends of blockchain technology among e-commerce in Kuala Lumpur and Selangor, Malaysia, and act as the motivation or pushing forces for the technology and future development. Four different scenarios would be formed to explore the future trends by using the scenario building method with the corresponding drivers from the impact-uncertainty analysis. These scenarios would forecast the four different possibilities that might occur in the next five years which is from 2022 to 2027.

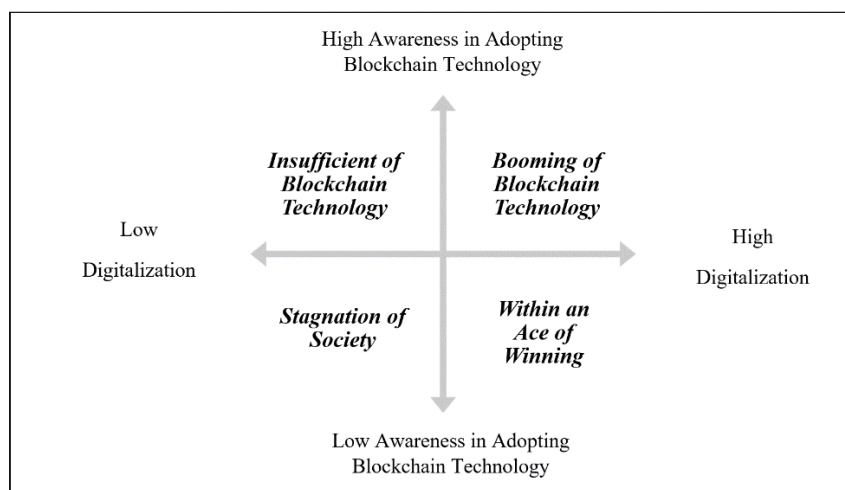


Figure 2: Development of four alternative scenarios

(a) Booming of Blockchain Technology

The first scenario occurs when there is a high awareness of adopting blockchain technology in e-commerce during the high digitalization. It refers to a situation where the technology is assimilated and has been utilized by every business model in the industries. This scenario served to be the most ideal in

the employment of blockchain technology in e-commerce as the technology existed at the right timing with the available resource and is highly aware by the public. Based on the article written by Mire (2019) which interviewed several founders from the industry of blockchain technology stated that the CEO and Co-Founder of CrowdZ commented that blockchain technology would become the backbone and focal point of e-commerce in the end just like how IP became the backbone of the Internet today. When all the information, data, and flow of monetary value are related to the Internet with multiple nodes, it would cause a delay in a process and lead to financial losses. Whereas, with the adoption of blockchain technology in e-commerce in the high digitalization, the technology may improve the operations of e-commerce from months to milliseconds. Again, Mire (2019) also interviewed Justas Pikelis that mentioned the booming of blockchain technology in the future of e-commerce would enhance the users in enjoying the perceived benefits provided by blockchain technology in e-commerce such as experiencing instant transfer with low transaction fees without having geographical boundaries issues. There are close relations when relating the technology with cryptocurrencies as the elimination of involvement by intermediaries like a bank may reduce the transaction fees as well as the service fees while reducing the time needed for the transferring process.

(b) Within an ace of winning

Within an Ace of Winning is occurs when there is low awareness of adopting blockchain technology in e-commerce in a high digitalization. It illustrates the least concern by users in comprehending the usefulness and benefits gained through the implementation of blockchain technology in e-commerce in a high digital period. It is unfortunate as there are abundant resources that existed in the decades but did not fully utilize by the environment. Kramer (2019) stated that the public awareness towards the technology is rather low, instead, most of the respondents only recognized the cryptocurrencies like Bitcoin. De Meijer (2020) further explained that blockchain technology has a reputation barrier as the public with basic knowledge of the technology would relate it with the use and disadvantages of cryptocurrencies. Tong and Gong (2020) realized that the Malaysian businesses did not aware and apply the digital technologies actively compared to the population and government of Malaysia, which causes them to lag behind the large companies and struggle to survive during the pandemic. Choi, Chung, Seyha, & Young (2020) analyzed that the reason for the low adoption rate with the perceived value of technology is due to a few factors. For instance, the implementation of new technology into the industry can be complex and time cost, it restricted the companies from taking the risk to invest in a project that is not aware by the end-users. This example can correspond with the lack of financial resources faced by the companies. The issues can be critical but tangible in restricting the companies to be aware of and adopting the technology (Brown, 2021). The introduction and growth stage of the technology can be uncertain and needed high investment to support and cover the technology till the mature stage.

(c) Stagnation of society

The third scenario is describing the stagnation of society by having a low awareness of adopting blockchain technology in e-commerce within the low digitalization. This scenario illustrates that people are not concerned and demanding with the technology development while the industries are still staying behind without employing any digital technology. Meanwhile, the technology and future development would be slow due to the lack of resources intensives or knowledge in innovating the technology. The society in the low digitalization can be related to the digital immigrant as the people in this category were born without widespread digital technology and before the digital age. The lifestyle and everything were physical and tangible. For instance, when an individual wants to restock household products, they will need to walk in the store or through home shopping (Goodwin, 2016). The emerging of blockchain technology in e-commerce to improve future development is restricted and uncertain as people are satisfied with the current quality of life and do not seek and demand technology advancement. Hence, the stagnation of society occurs and will lead to little or no growth in the economy (Kelly, 2021).

(d) Insufficient of Blockchain Technology

The scenario regarding the insufficient of blockchain technology happens when there is a high awareness of adopting blockchain technology in e-commerce in a low digitalization. The adoption of

blockchain technology in e-commerce received high demand and consciousness from the public and society but unfortunately, the insufficient technology in the low digitalization would not sustain and achieve the users' demand. The migration of the traditional system to blockchain technology can be complex and costly as the blockchain-based systems are applying cryptography heavily in achieving their objectives which are traceability and immutability (Rahman, Khalil, & Bouras). De Meijer (2020) explained that the high awareness of adopting blockchain technology urges the demand of qualified blockchain staff and miners in operating the system. Hence, it has become a challenge in recruiting a qualified person to settle and manage the peer-to-peer networks, especially when the operation of technology is required special qualifications. Indeed, there is still a minority of companies with stable positions that acted as the early adopters in fulfilling the public demand. However, the complexity and uncertainty in the business policies and climate of investment would restrain the technology development. The rules and regulations always are the main concern for the developers and users in employing the technology. Without a standard or policies given by the government, it would be a challenge for the developers to innovate and invest in new technology especially in a society with low awareness and low digital technologies.

5. Conclusion

In conclusion, the first objective is to investigate the key drivers in employing blockchain technology among e-commerce in Kuala Lumpur and Selangor. Therefore, the two key drivers with the highest mean in the level of impact and uncertainty are selected respectively from the impact-uncertainty analysis which is the digitalization and awareness of adopting blockchain technology. Furthermore, four alternative scenarios which included the booming of blockchain technology, within an ace of winning, stagnation of society, and insufficient of blockchain technology are formed based on the selected drivers by using the scenario building analysis to explore the future trends of blockchain technology among e-commerce in Kuala Lumpur and Selangor.

However, the research is subjected to its limitations throughout the process and should be avoided and awarded by future research. Firstly, the sample size of the study is relatively too small to indicate the whole perspective of blockchain technology in e-commerce. Furthermore, the global pandemic and standard operating procedure (SOP) that set by the government restricted the researcher to collect more questionnaires, especially from the developers' sides and lastly, gender bias can be one of the limitations of the research as most of the respondents are female which led to an imbalance of perceptions towards the study.

Hence, few recommendations for future study as well as blockchain technology. For the future study, the data collection should involve more states in Malaysia to increase the accuracy and possibilities of technology adoption as developers would not take the risk to invest in a technology that is not favored and applicable by the end-users and the government's standpoint towards the technology is also important in improving public awareness as the developers and users would depend on the government rules and policies to decide whether to adopt the technology. While in the blockchain technology perspective, a contingency plan and solving method regarding the negative implications discussed in the scenario building should be prepared and generated by the industries and aware by the society for the aim of technology development and its sustainability.

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