emerald1

by Emerald1 Emerald1

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E-commerce Acceptance in the Dimension of Sustainability

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E-commerce Acceptance in the Dimension of Sustainability

Abstract

Purpose: Technology presents e-commerce as an alternative buying and selling place that is accepted by the public. The high growth of e-commerce has an impact on the sustainability of both the economic dimension, the social dimension and the environmental dimension. Indonesia is the country with the fastest growing e-commerce, but also has the second largest plastic waste in the world. The synergy of sustainability for e-commerce is an interesting and awaited innovation. This is because sustainability has become the responsibility of all countries in the world.

Design/ methodology/ approach: A theoretical understanding of the context of sustainability in e-commerce separately focuses on a company perspective and the use of green products from a consumer perspective. It requires the involvement of e-commerce stakeholders as a whole to get comprehensive research results. The use of qualitative research methods with exploratory approaches is used in this study to reveal the concept of sustainability in e-commerce in Indonesia.

Findings: This study found similarities in the topic of acceptance of sustainability in e-commerce with UTAUT including performance expectancy, effort expectancy, facilitating conditions, social influence, habits. Changes to the variables revealed due to changes in the e-commerce phase. The variable trust is in the introduction phase and builds trust in e-commerce. Currently in Indonesia the e-commerce phase is in a phase of growth and value formation. Habit creation and dependence is a requirement for value formation. Several new topics were proposed in this study, namely awareness, security, logistics, and user interface (UI) & user experience (UX). The establishment of an e-commerce identity through UX clearly shows its target market. The e-commerce phase and the topics involved in it can become a reference for e-commerce regulation making in Indonesia.

Research limitations: This study is limited to e-commerce in Indonesia with data processing limited to February 2020

Practical implications: The results of this study provide an overview of increasing the intention to use e-commerce through human acceptance and engineering dimensions. This research also reveals the stages of e-commerce in Indonesia that can be used as a reference for determining the right regulations for e-commerce and the trade-offs for sustainability.

Originality/ value: This study produces additional references to the intention to use technology by completing the UTAUT model. This study reveals changes variables in perceived value that are interesting for further research along with technological developments and changes in people's habits. Exploration carried out can add references to the application of sustainability in e-commerce, especially in developing countries.

Keywords: e-commerce, sustainability, UTAUT, perceived value, stage

1. Introduction

Technology presents alternative buying and selling places that can be accepted by the public. The growth of online businesses worldwide (Nisar & Prabhakar, 2017) confirms the role of technology in the internet revolution. The spread and ease to use of the internet allows e-commerce to become more and more widely used. E-commerce makes shopping easy for customers, searching for products, comparing prices (Wagner, 2015), efficiency (Heuer et al., 2015) and improving customer service (Moisescu, 2018; Safavi, 2009). The acceptance of a technology or system has an impact on the increasing intention to use e-commerce (Chen & Lin, 2015; Venkatesh et al., 2003). This research involves the theory of technology acceptance, especially in e-commerce. In general, technology adoption theory discusses human attitudes in intending to use technology (Lin et al., 2019b; Venkatesh et al., 2003, 2016; Williams et al., 2015). However, the addition of variables (Yousafzai et al., 2007) is needed to uncover research problems (Krontiris et al., 2016; Omar et al., 2017; Reyes-Menendez et al., 2018; Sabi et al., 2016; Sim et al., 2019; White Baker et al., 2019). This study proposes a technical dimension to complement the theory of acceptance (DeLone & McLean, 2003). The increasing intention to use e-commerce due to acceptance of the technology or system, is related to the issue of sustainability caused by e-commerce. As part of the digital economy (Goldfarb & Tucker, 2019), online trading according to the 2018 McKinsey report, has an impact in four areas (Das et al., 2018) relating to the dimensions of sustainability, namely financial benefits, job creation, buyer benefits and social equity. In sustainability economics, the digital economy has become a new phenomenon that has a strategic role in the development of the global economy (Lambert, James; Tran, Anh; Reiners, 2020). E-commerce is related to the environment sustainability dimension, for example e-commerce causes a positive environmental effect on reducing Co2 gas emissions due to reduced individual travel needs by consumers (K. Chueamuangphan · C. Visvanathan; P. Kashyap, 2019). However, e-commerce produces a negative environmental impact on waste packaging (Bird, 2018). The use of e-commerce leads to more disposable plastic waste due to packaging (Rhea Wessel, 2019). An ordinary e-commerce package can use up to seven types of packaging materials: paper, envelopes, cardboard boxes, plastic bags, woven bags, ribbons, and support materials (bubble wrap, Styrofoam). The social dimension consists of aspects of human needs and cultural development, which focus on equality (Sun et al., 2013). Job loss that should be the responsibility of e-commerce is the potential of replacing traditional and physical shops with virtual ones, causing job losses to some people, however e-commerce creates job opportunities for entrepreneurs and people with digital literacy (Biagi & Falk, 2017). Companies tend to have a focus on the economic dimension because they strive to achieve income and financial growth (Bergman, 2014). Economic sustainability can often be emphasized as a prerequisite for company growth and development. However, no company can achieve economic growth if it impacts on environmental damage. Therefore, it can be stated that all dimensions of sustainability are equally important. This research study is important to discuss to integrate the use of e-commerce with sustainability as a form of support for Sustainability Development Goals (United Nations Member States, 2015) in the scope of technology and specific use of e-commerce. The integration of e-commerce into sustainability makes it more sustainable (Arnold et al., 2018). However, there are still few studies that link the intention to use with sustainability (Biagi & Falk, 2017; Hong, 2018). Previous research discussed the sustainability of e-commerce from a company perspective (Oláh et al., 2018). Meanwhile, other research discusses sustainability from an environmental perspective, and green product consumers. Other research on sustainability focuses on using products directly from a consumer perspective, not on e-commerce (Kautish & Dash, 2017). So that it leaves a gap in understanding the overall

stakeholder perspective on the dimensions of sustainability (economic, social, environment), especially e-commerce in Indonesia. For this reason, research that involves the dimensions of sustainability from various perspectives is needed so that a comprehensive e-commerce integration result on sustainability is obtained. This study aims to reveal a comprehensive integration of the use of e-commerce for sustainability. An explorative approach (Chofreh et al., 2018) is used in this study to reveal the concept of sustainability in e-commerce in Indonesia.

2. Literature Review

2.1 Human Perceived

In this study, human acceptance is defined as perceived value (human side). Perceived value has been considered a key in marketing by companies (Chen & Lin, 2015) and has been discussed in various marketing researches (Salem Khalifa, 2004). The significance of acceptance is based on the value of the product or service perceived by the customer (Zeithaml, 1988), which can be defined as the exchange between perceived benefits and perceived costs (Lovelock & Wirtz, 2014). The acceptance referred to in this study is the acceptance of e-commerce related to sustainability (Das et al., 2018). E-commerce provides convenience (Wagner, 2015), efficiency (Heuer et al., 2015), improved customer service (Moisescu, 2018; Safavi, 2009) and increases e-commerce acceptance so that users continue to grow, see Table 1. In a study of mobile commerce, (H. W. Kim et al., 2007) shows that perceived value is the overall effectiveness of services assessed by individuals, including the benefits obtained by individuals. Basically, acceptance is a psychological evaluation, which is not only in the product and ownership of a particular product or service, but also comes from the consumers themselves (Tynan et al., 2010). The most common characteristics of human acceptance are functional values, social values, emotional values, epistemic values, and conditional values (Chen & Lin, 2015).

2.2 Dimensions of Technology

Designers must be careful when choosing an application and navigation scheme in e-commerce (Ganguly et al., 2010). Communication in an information system is formed into three levels (Shannon, 1997) namely the technical level, semantic level and effectiveness level. Furthermore, the level of communication is broken down into six dimensions (DeLone & McLean, 2003), namely: System quality measures technical success; Information quality measures success semantically; and use, user satisfaction, individual impacts and organizational impact measure success effectively. Research conducted by (Hasan et al., 2012) formulates a heuristic evaluator to obtain the technical dimensions of e-commerce. This study adopts the technical dimension of e-commerce which is widely used in previous research studies. Technological variables are added to the acceptance theory for research problems that have not been revealed with the original acceptance theory (Hwang et al., 2019; Krontiris et al., 2016; Ofori et al., 2018; Reyes-Menendez et al., 2018; Sim et al., 2019; White Baker et al., 2019).

2.3 Intention to use in The Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT is an acceptance theory that integrates eight other theories (Lin et al., 2019a; Venkatesh, Viswanath; Morrisw, Michael G.; Davis, Gordan B.; Davis, 2003; Venkatesh et al., 2016; Williams et al., 2015). This combined model is then called the Unified Theory of Acceptance and Use of Technology, UTAUT. As the most recently formulated acceptance theory (Venkatesh et al., 2016) and is a combination of various other acceptance theories, it is hoped that UTAUT is more comprehensive in measuring acceptance (Samaradiwakara & Gunawardena, 2014; tining haryanti & Pribadi, 2019). This study uses UTAUT to explore the intention to use in e-commerce. In general, UTAUT focuses on the intention to use technology in terms of human behaviour (see

Table 2), but this study proposes a technological dimension to complement the perspective of the intention to use e-commerce technology (Asghar Afshar Jahanshahi, 2012; Bhandari et al., 2019; Lin et al., 2019b; Mitrevski & Hristoski, 2014; Wade & Nevo, 2005). Several studies discuss the intention to use of various acceptance theories (Chen & Lin, 2015; Hong, 2018; Lin et al., 2019b; Prayoonphan & Xu, 2019; Xiao et al., 2019)

2.4 E-commerce and Economic Sustainability

E-commerce is growing rapidly globally from year to year (emarketer, 2019). E-commerce growth in Indonesia is the fastest in the world (see Table 1) based on data released by the British research institute, Merchant Machine (Katadata, 2019) with 78% growth in 2018 and ranked 7th in the world in 2019 (emarketer, 2019). As part of the digital economy (Goldfarb & Tucker, 2019), online commerce is a new phenomenon that has a strategic role in the development of the global economy (Lambert, James; Tran, Anh; Reiners, 2020). E-commerce makes a major contribution to the digital economy. The value of online trade financial benefits in Indonesia is currently around 2.5 billion dollars and is predicted to be 20 billion dollars in 2022 (Eddy Cahyono Sugiarto, 2019). Four of the eight unicorns in Southeast Asia come from Indonesia, namely Gojek, Traveloka, Tokopedia and Bukalapak. This confirms the strength of digital business in the Southeast Asia Region. The value of venture capital funding in Indonesia for three years reached 38 percent of total funding in Southeast Asia (Eddy Cahyono Sugiarto, 2019). The growth of e-commerce, especially in Indonesia, Figure 1 (Google et al., 2019), contributes to economic sustainability (Media Indonesia, 2019). Considering the rapid growth and visibility offered by e-commerce to consumers and the public, the integration of e-commerce with economic sustainability is needed (Macchion et al., 2017; Mangiaracina et al., 2015; Z. Yang et al., 2016). This is in line with the attention and awareness of the importance of sustainability (Macchion et al., 2017).

2.5 E-commerce and Environment Sustainability

There is debate whether e-commerce has a positive or negative effect on the three dimensions of sustainability, especially the sustainability environment. Research in the field of transportation related to e-commerce has detected positive and negative effects of e-commerce on the environment, including congestion, vehicle fuel and emissions (D, Carrillo; R, E, Duncan; J, N, Ploetz, A. F, Campbell; R, C, Ploetz ; J, E, 2014; K. Chueamuangphan · C. Visvanathan; P. Kashyap, 2019). The growth of online trade is followed by an increase in the number of shipments and transportation, especially in vehicle traffic (Mangiaracina et al., 2015). However, this does not always have a negative meaning. The results show that because the delivery reaches the consumer's home, it can reduce emissions caused by the number of private vehicle trips of the consumer to the shop (D, Carrillo; R, E, Duncan; J, N, Ploetz, A. F, Campbell; R, C, Ploetz ; J, E, 2014). A negative effect connected to inefficient delivery might occur when, someone orders different items from various e-commerce, which are sent to the same location (Mangiaracina et al., 2015; Nisar & Prabhakar, 2017). Another negative effect from the environmental dimension is packaging (Laah, 2015). Packaging will become waste from e-commerce, for example plastic waste (Bird, 2018). Plastic waste in Indonesia is the second largest in the world (Post, 2018), see Table 1 and Figure 2 (Jambeck et al., 2015). E-commerce integration into environmental sustainability is needed so that negative effects on the environment caused by e-commerce(Carrillo et al., 2014; Mufidah et al., 2018; Nia et al., 2018; Nisar & Prabhakar, 2017; Van Loon et al., 2015; Wang & Huang, 2018) can be minimized (Rhea Wessel, 2019).

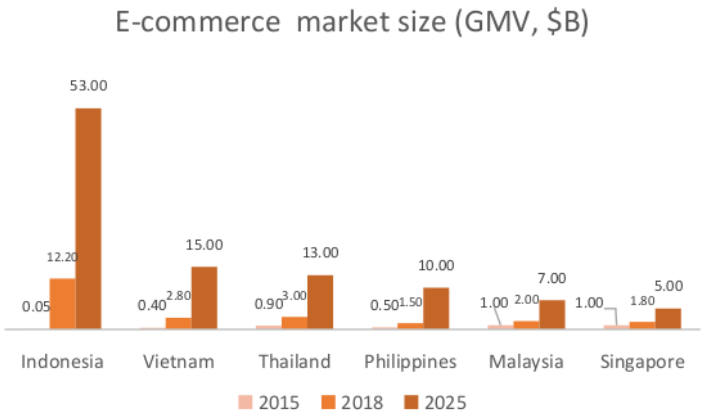

Figure 1 E-commerce Market Size (Google et al., 2019)

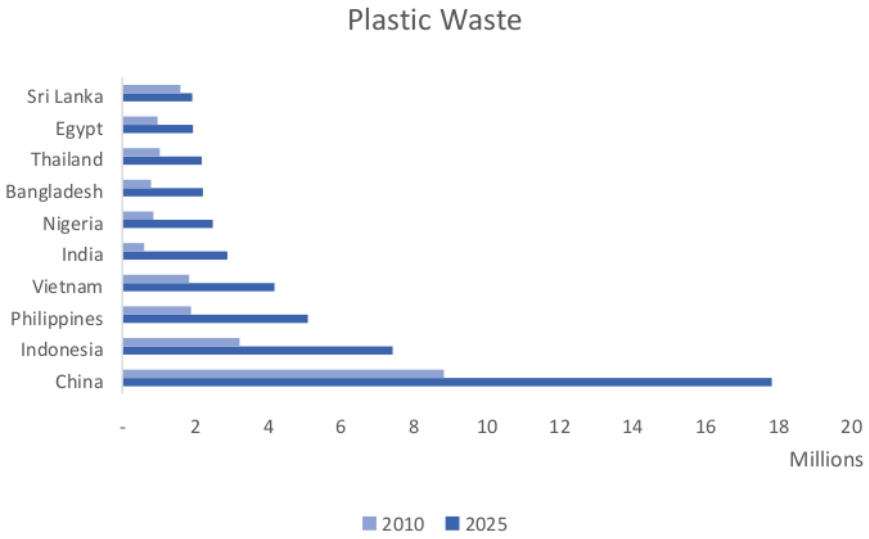

Figure 2 Plastic Waste (Jambeck et al., 2015)

Table 1 Indonesian e-commerce data

Aspec	Description	Reference
economic growth	78% by 2018, number 1 in the world	(Databoks.Katadata, 2019a)
e-commerce adoption	As many as 90 percent of internet users aged 16 to 64 years in Indonesia have purchased products and services online. The highest-commerce adoption in the world	(cnnindonesia.com, 2020)

e-commerce transaction	113T/month in 2019. From the total online spending of US $ 8 billion in 2017, it increased to US $ 55 billion to US $ 65 billion in 2020	(Bisnis.tempo, 2019), (Das et al., 2018)
Plastic waste	3,22Million metric tons/year by 2018. Number 2 in the world after China	(Post, 2018)
Labour	+16 million e-commerce supporting job	(Techinasia, 2019)
Shipping	1.6 billion transaction packages via e-commerce are sent per year in 2022	(Databoks.Katadata, 2019b), (Das et al., 2018)

2.6 E-commerce and Social Sustainability

It is estimated that there will be 26 million new jobs in 2022 (Kominfo.go.id, 2020) as a result of the digital economy, see Table 1. Job creation is dominated by micro, small and medium enterprises. One of the unicorns in Indonesia has 6.4 million sellers on its e-commerce platform, 86.5% of new businesses are through e-commerce, with 97% of users spread across rural areas (Efrem Siregar, 2019). Information and communication technology today facilitates better communication and knowledge transfer for companies at the global level, enabling the expansion of the scope of the e-commerce market worldwide (Cui et al., 2017). Through this, e-commerce has helped to increase social innovation. Job loss that should be the responsibility of e-commerce, is the potential replacement of traditional physical stores with online stores, causing job loss (Biagi & Falk, 2017), however, e-commerce creates job opportunities for employers and people who have digital literacy.

2.7 Qualitative Research

Qualitative research is used to answer problem formulations that are not answered by quantitative research (Creswell, 2015; Nehrig et al., 2019). Basically, this research is aimed at answering the question "what aspects of e-commerce are considered to be integrated with the dimension of sustainability". To answer this question, this study uses exploratory research methods, exploring a particular phenomenon, namely e-commerce integration in the Sustainability dimension. Whereas qualitative exploration shows that consumers can be directly involved with the image of a particular product which is perceived as communication between the customer to the seller in a two-way exchange of information (Gligor et al., 2019). Explorative research is a type of qualitative research as stated by Creswell, quoted by Eddles-Hirsch, qualitative research is a study that is interested in analyzing and describing the experience of an individual phenomenon in the everyday world (Eddles-Hirsch, 2015). Exploratory research is a form of research approach with the aim of finding information related to a problem or topic that is not yet fully known or understood by a researcher. Explorative research is a form of approach whose purpose is for something (interesting phenomenon) that is not yet known, not yet understood, or the problem is well recognized., Explorative research is a form of approach whose purpose is for something (interesting phenomenon) that is not yet known, not yet understood, or the problem is well recognized (Kotler & Keller, 1997). This research uses an exploratory approach, to study in depth a case that occurred (Creswell, 2007) and evaluate the concept developed (Chofreh, et al., 2018). The use of conceptual research, which is a method that emphasizes literature review to develop a concept, is used to prepare several types of questions as guidance in obtaining primary data in the form of information, information, and other data as initial data required. Qualitative research with an explorative

approach is used to examine topics that have not been fully revealed. This research is a qualitative research with an explorative approach that is obtained from the phenomena that occur. The phenomenon in question is the presence of e-commerce as a form of technology, especially in Indonesia with the fastest growing e-commerce and, as a support for the sustainability development goals in the technology sector (United Nations Member States, 2015). Exploration regarding the adoption of sustainability in e-commerce needs to be done to reveal the holistic integration of e-commerce in sustainability, especially in Indonesia. Meanwhile, theoretical understanding of the context of sustainability (economic, social and environment) on e-commerce in the literature focuses on the company's perspective (Oláh et al., 2018). Other research on sustainability focuses on using products directly from a consumer perspective, not specific on e-commerce (Mufidah et al., 2018; Nia et al., 2018). Thus leaving a gap in understanding the perspective of stakeholders as a whole on the dimensions of sustainability (economic, social, environment), especially e-commerce in Indonesia. Thus, an exploratory study in this research was conducted to reveal the main themes and concepts in the application of sustainability in e-commerce.

Table 2 Acceptance theory and additional variable

Model	Founder	Components
UTAUT	(Venkatesh et al., 2003)	Performance expectancy, effort expectancy, social influence, facilitating conditions
UTAUT2	(Venkatesh et al., 2012)	UTAUT + hedonic motivation, price value, habit
Additional variable	(Chiu et al., 2010) (White Baker et al., 2019) (Gu et al., 2019) (Reyes-Menendez et al., 2018) (J. B. Kim, 2012) (Krontiris et al., 2016) (Ofori et al., 2018) (Schaupp et al., 2010) (Chan et al., 2012) (Pascual-Miguel et al., 2015) (Moon & Hwang, 2018) (Sanny, 2017) (Sim et al., 2019)	UTAUT + Technical
Additional variable	(Omar et al., 2017) (Sabi et al., 2016) (Chan et al., 2012) (Krontiris et al., 2016) (Khalil Moghaddam & Khatoon-Abadi, 2013)(Pazalos et al., 2012) (Chan et al., 2012) (Zheng et al., 2013)	UTAUT + Trust

3. Previous Research

Previous research that discussed "Intention to Use" with the titled: “Factors Influencing the Intention to Use the Common Ticketing System (Spider Card) in Thailand” (Prayoonphan & Xu, 2019), “Social and Personal Dimensions as Predictors of Sustainable Intention to Use Facebook in Korea: An Empirical Analysis” (Hong, 2018), “Understanding the Sustainable Usage Intention of Mobile Payment Technology in Korea: Cross-Countries Comparison of Chinese and Korean Users” (Lin et al., 2019a). The other research is “The Effects of Online Shopping Context Cues on Consumers’ Purchase Intention for Cross-Border E-Commerce Sustainability” (Xiao et al.,

2019) discussed the intention of cross-regional e-commerce purchases. "The impact of customer experience and perceived value on sustainable social relationship in blogs: An empirical study" (Chen & Lin, 2015), This research is to understand the formation of sustainable social relationships on the use of blogs in the context of online marketing. In general, this research literature discusses the intention to use technology with various theories. Research entitled "The Effect of Green Purchase Intention Factors on the Environmental Friendly Detergent Product (Lerak)" (Nia et al., 2018) and "Understanding the consumers' behaviour intention in using green eco label product through Pro-Environmental Planned Behaviour model in developing and developed regions: Lessons learned from Taiwan and Indonesia" (Mufidah et al., 2018) focuses on the use of green products from a consumer perspective. The research about sustainability; "Achieving Sustainable E-Commerce in Environmental, Social and Economic Dimensions by Taking Possible Trade-Offs" (Oláh et al., 2018), discusses trade-offs in e-commerce from a company perspective. Research on environmental emissions and shipping; "The Optimal Carbon Reduction and Return Strategies Under Carbon Tax Policy" (Wang & Huang, 2018), "What factors determine e-satisfaction and consumer spending in e-commerce retailing?" (Nisar & Prabhakar, 2017), "Environmental implications for online retailing "(Carrillo et al., 2014), "A comparative analysis of carbon emissions from online retailing of fast moving consumer goods" (Van Loon et al., 2015). Research on the social impact of e-commerce; "The impact of ICT and e-commerce on employment in Europe" (Biagi & Falk, 2017). Research on consumer interaction in e-commerce; "Online disintermediation: Differences in the behaviour of traditional retailers in adopting e-commerce" (Andonova, 2003), "Assessing the effects of consumers' product evaluations and trust on repurchase intention in e-commerce environments" (Sullivan & Kim, 2018). About economic growth and e-commerce competition; "Scale, congestion, efficiency and effectiveness in e-commerce firms" (Z. Yang et al., 2016), "International e-commerce for fashion products: What is the relationship with performance?" (Macchion et al., 2017), "A review of the environmental implications of B2C e-commerce: A logistics perspective" (Mangiaracina et al., 2015).

Table 3 Previous Research

Number	Topic	References	Summary
1	Intention to use	(Chen & Lin, 2015; Hong, 2018; Lin et al., 2019a; Mufidah et al., 2018; Nia et al., 2018; Prayoonphan & Xu, 2019; Xiao et al., 2019)	These literatures discuss about the intention to use technology with various theories.
2	Sustainability	(Biagi & Falk, 2017; Carrillo et al., 2014; Nisar & Prabhakar, 2017; Oláh et al., 2018; (Biagi & Falk, 2017; Carrillo et al., 2014; Macchion et al., 2017; Mangalaraj et al., 2014; Nisar & Prabhakar, 2017; Oláh et al., 2018; Van Loon et al., 2015;	These literatures discuss about the dimension of sustainability: environment, social and economic

		Wang & Huang, 2018; H. Yang et al., 2016; Van Loon et al., 2015; Wang & Huang, 2018; Mangiaracina et al., 2015)	

From the results of literature studies on sustainability in e-commerce, see Table 3, it can be concluded that e-commerce integration is needed to increase competition without harming e-commerce itself. For example delivery process (Arnold et al., 2018; Nisar & Prabhakar, 2017) and environmental emission (Carrillo et al., 2014; Wang & Huang, 2018) on customer expectations for delivery speed; selection of environmentally friendly packaging (Van Loon et al., 2015) towards additional costs; the social impact of job loss (Biagi & Falk, 2017) on workers in traditional shops; the absence of face-to-face interactions with customers towards loyal and trustworthy customers (Andonova, 2003; Sullivan & Kim, 2018); reducing price (Mangiaracina et al., 2015) due to high competition (Macchion et al., 2017)

4. Methodology

The choice of research method (Chofreh et al., 2018; Jayawickrama et al., 2016) depends on the research question. The research question in this research is: "How is the integration of e-commerce to sustainability through a more holistic perspective to use." The integration means "what are the adjustments / integration of e-commerce to sustainability". Based on the research questions, the qualitative research approach was chosen (Gholamzadeh Chofreh et al., 2016; J. M. L. Morse, 2013) as explains that conceptual research is used to answer the question "What is the process of becoming ...?" and answered the question "What are the dimensions of this experience ...?". This research uses an exploratory approach, to study in depth a case that occurred (Creswell, 2007) and evaluate the concept developed (Chofreh, et al., 2018). In-depth interviews are used to answer questions, "why", "what" and "how", where these types of questions cannot be explored through quantitative methods (Jayawickramaa, et al., 2016; Meredith, 1993). This study explores in-depth information about the phenomenon of e-commerce development in Indonesia, see Table 1 and Sustainability which has become a world issue, namely the Sustainability Development Goals (United Nations Member States, 2015). This study aims to explore the integration of e-commerce towards sustainability through the intention to use e-commerce holistically from the perspective of accepting human behaviour and technological dimensions. This research is an explorative study obtained from the phenomena that occur. The phenomenon in question is the growth of e-commerce in Indonesia, the fastest in the world (see Table 1) and as a form of support for the implementation of the Sustainability development goal. Exploration to reveal the integration of e-commerce in sustainability is carried out through various perspectives of e-commerce stakeholders to obtain comprehensive research results. Qualitative research reveals in-depth information from informants, for that informants in qualitative research are less than quantitative research, in phenomenological studies suggested 5-25 (Cresswell, 1998), Morse recommends at least 6 respondents (J. . Morse, 1994) , at least 6 to 12 respondents (Boddy, 2016), and at least 5 respondents (Dworkin, 2012). This study involved 9 informants and had met the adequacy of the number of respondents in qualitative research (Boddy, 2016; Cresswell, 1998; Dworkin, 2012; J. . Morse, 1994). This study aims to broadly reveal e-commerce sustainability from the perspective

of e-commerce stakeholders (Bernard, 2020; Stakeholdermap.com, 2015). This qualification research involved 9 respondents who had fulfilled their requirements in providing the information needed for research (Boddy, 2016; Creswell, 2015). Qualifications are in accordance with the suitability of the job / position and length of time worked. While there is a limit to this part of the research on the number of supporting respondents such as government, consultants, etc., the selection of respondents from various criteria provide comprehensive set of e-commerce information. This allows broader perspective on sustainability in e-commerce. Further research is needed to deepen exploration of certain categories of e-commerce by increasing the number of respondents in that category.

To increase confidence in the research results, this study uses research results testing with Lincoln and Guba's evaluation criteria available at http://www.qualres.org/HomeLinc-3684.html (Cohen D, 2006). Techniques for establishing credibility by Lincoln and Guba is Prolonged Engagement. This research spends sufficient time, more than 4 months in the field to learn or understand about e-commerce and sustainability. This involves spending adequate time observing various aspects of a e-commerce regulation and developing relationship with the respondent (Rahayu & Day, 2015, 2017; United Nations Member States, 2015). At the beginning of the study, the research objectives were informed to the public and potential respondents involved, so that the public and potential respondents knew that the purpose of observation was to document their activities within the scope of e-commerce. Sufficient information on research topics has been conveyed to prospective informants since the beginning of the meeting (Marshall & Rossman, 1999). Discussions and visits to potential respondents were carried out repeatedly and intensely since every 4 months to build relationships with potential respondents (Kawulich, 2005; Lincoln & Guba, 1985). The prolonged involvement allows researchers to have access to community members and potential informants and provides an understanding that these activities are beneficial to them as individuals, and can use these conversations to obtain data as a complement to formal interviews. The narratives and themes that emerged from the research were examined by members and colleagues to help ensure reliable data (Guba & Lincoln, 1994). The building transferability technique in this study uses a thick description by describing the phenomena that occur. For example, starting from the sustainable development program by the United Nations (United Nations Member States, 2015), the increasing intention to use e-commerce in Indonesia (cnnindonesia.com, 2020), environmental hazards due to plastic waste (Post, 2018) and others details described in the previous chapter. Further transferability testing in this study is discussed in the findings chapter. This study involved dependency testing which showed that the findings were consistent and repeatable. Examples of reliability tests in this study are presented in Table 12. While the confirm ability test - the level of neutrality or the extent to which the research findings were formed by respondents and not the bias, motivation or interest of researchers in this study are presented in Tables 10 and Table 13, and triangulation evaluation is presented in the Table 11. In summary, the stage of evaluating the results of the research uses the techniques suggested by Lincoln and Guba.

Data Collection

An exploratory study was conducted to reveal the main themes and concepts in the application of sustainability in e-commerce. Data collection was carried out by a process of field observation, interviews and document review. The document review in this study uses literature searches in Google Scholar and reputable journals with the keywords "e-commerce", "electronic commerce", "sustainability" for the category of e-commerce and sustainability. The keywords for category of

"Intention to use" are: "intention to use", "acceptance theory", "UTAUT". The keywords for category of qualitative research are: "Qualitative Research", "Qualitative Models". The keywords for category of technology are: "e-commerce technology", "e-commerce website", "e-commerce standard website". The document review in this study uses literature searches from reputable journals. The detailed document search literature review is not possible to be published in this article as a whole, however, in summary, Table 4 shows an example of the literature review search process.

Table 4 Literature Search

Keywords	Resource		In topic		TRA	TPB	TAM	UTAUT
e-commerce, electronic commerce, electronic market, digital commerce, digital market	Google Scholar	11000	Intention Sustainable Adaption Technology Theory	4630	202	74	436	35
	Science direct	3921		1205	34	15	44	11
	MDPI	3899		783	20	23	25	8
	Springer	7915		1527	121	101	66	6
	Emerald	6552		2319	41	45	130	25
	IEEE	8813		357	44	34	15	6

(Haryanti & Subriadi, 2020), modified

This study uses a theoretical approach to UTAUT technology acceptance on sustainability e-commerce in Indonesia. In general, the literature that has been selected based on search keywords is then reviewed before being selected as a reference in this study using several criteria:

1. Having a conceptual model similarity on a certain topic, for example (Oláh et al., 2018)
2. Have writer's expertise such as Creswell, Venkatesh, etc. (Creswell, 2015; Venkatesh et al., 2003)
3. Having the latest research on the topic (Nagy et al., 2018; Oláh et al., 2018; Pradhan et al., 2017)
4. Published by publishers that have a focus on qualitative research(Boddy, 2016)

Other supporting documents are traced to the regulations of the United Nations sustainable development program on the technological aspect, with a focus on international regulations on sustainability (Unclos1982, 1982; United Nations, 1992; United Nations Department Of Economic And Social Affairs, 1992; United Nations Environment Programme & United Nations, 2016). Document review is needed to explore materials related to research such as e-commerce, sustainability, intention to use and qualitative research. Material for the study is obtained from journals, e-books, papers, news and websites, see Table 5

Table 5 Document Review

No	Category	Description	Source
1	Perceived Human Dimension	1. Definition of perceived Human 2. Perceived Human Dimension	(Chen & Lin, 2015; Ledden et al., 2007; Sheth et al., 1991; Sweeney & Soutar, 2001), papers, online articles

2	Qualitative Research	1. Qualitative research design 2. Qualitative research stages 3. Qualitative data collection procedures 4. Analysis and report	"Sample *size* for qualitative research", Qualitative Market Research: An International Journal (Boddy, 2016; Creswell, 2015)
3	Technology Dimension	1. The factor of technological dimension in e-commerce 2. Evaluator of technical dimensions in e-commerce	(Cohen & Areni, 1991; Ganguly et al., 2010; Hasan et al., 2012; Z. Huang & Benyoucef, 2015; Lee & Benbasat, 2003; Reeves & Nass, 1998), papers, online articles
4	Acceptance Theory	1. Evolution of acceptance theory 2. Identification of variables in acceptance theory	(Lin et al., 2019b; Oláh et al., 2018; Venkatesh et al., 2003, 2016; Williams et al., 2015), papers, online articles
5	Sustainability	1. Sustainability Dimensions 2. Sustainability Policy 3. E-commerce Regulation	(Nagy et al., 2018; Pradhan et al., 2017; United Nations Member States, 2015), regulation, policy, papers, online articles, website

In summary, the category involvement in this study is presented in the conceptual model (Figure 3), there are perceived value, technology dimension, intention to use and sustainability.

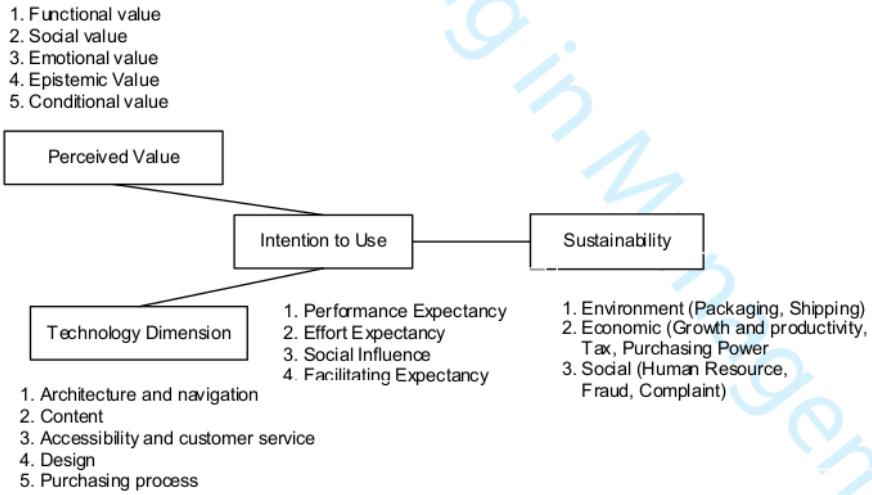

Figure 3 Conceptual Model

After the document review was processed, the informants were classified to obtain comprehensive data. Interviews and field observations are carried out simultaneously by observing parties related to e-commerce. Observations are made with direct involvement in e-commerce. Data found in observations are reviewed with other documents to determine content analysis. To answer research questions comprehensively, this study involved informants from various backgrounds. The

informants in this study are divided into Management Marketplace (marketplace in Indonesia), Seller, Digital business Management (Unicorn Digital business in Indonesia); Marketplace application users with certain criteria (bigcommerce.com, 2019); Government workers in departments related to finance and foreign affairs; Regulatory Observers, and Business and SME Consultants. In conducting research, researchers obtained data from informants by conducting direct interviews. Concepts that describe general ideas are identified and grouped into themes that may play an important role in sustainability in e-commerce. These themes are composed of several concepts. After classification of themes, transcripts are reviewed to select representative citations for each theme.

Data Analysis

Data analysis is carried out to obtain a general and comprehensive picture of the social situation or object of research. In this study, there are perceived value, technical dimension, intention to use, sustainability, see Figure 3. Data obtained from documents, observations, and informant interviews were analyzed using content analysis. The research is explorative in nature so that the theme is sought in the results of in-depth interview analysis. Data analysis techniques in this study were carried out by data reduction, data presentation, and verification by processing data using the help of NVivo qualitative software. The process of organizing data and making memos is carried out to facilitate the process of describing and interpreting data. The category identification is shown in Table 6

Table 6 Identification of themes and concepts about sustainability in e-commerce

Themes	The concepts explored
Functional value	*Alternative place for buying and selling*
	Effectiveness
Social Value	*Needs*
	Personalized Approach
	Public Figure Endorsement
Emotional value	*Window Shopping (for refreshment)*
Epistemic value	*Minimal Effort*
Conditional value	*No Queue*
	No Transportation Needed
	Fast Process
Technical dimension (User Interiface)	*Standard UI*
	Good Customer Journey (UX)
	Strong and targeted identity based branding
	Familiarity
Performance Expectancy	*Time Efficiency*
	Practical use
Effort Expectancy	*Convenience*
	Ease to use
Social Influence	*Social influence*
	Interesting ad
Facilitating Conditions	*Fast delivery*
	Many logistical choices

Trust	*Confidence in marketplace*
	Introduction phase has passed
Habit	*Dependency*
Economic Sustainability	*Growth and productivity*
	Tax
	Purchasing Power
	Many discount (Burning Money)
Social Sustainability	*Job Creation*
	Possibility of Fraud
	Complaint Handling
Environment Sustainability	*Delivery Packaging*
	Nation Awareness
	Shipping Process
	Safety in Delivery
Regulation	*There is no e-commerce regulation yet*
	Regulations regarding trademark protection have not been properly implemented
	Plastic diet has not been applied nationally

After conducting interviews with each respondent, it can be considered the difference in opinion of each respondent. A total of 16 themes can be identified from the interviews (see Table 6), including Functional values, Social Values, Emotional values, Epistemic values, Conditional values, Technical Dimensions of the UI, Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions , Trust, Habit, Economic Sustainability, Social Sustainability, Environment Sustainability, Regulation. The findings in this study are discussed in the findings chapter. The content analysis in this study uses the content analysis method in NVivo software. NVivo is a data analysis software for qualitative research. Interview data in the form of audio is changed in the form of interview transcript. Making a Quotation is done by sorting the statements in the interview. The purpose of the quotation process is to provide easy storage of documents as a support that can later be used again. Quotations are selected based on important points in each dimension and are arranged based on document review and interview results. Coding functions as an important activity, because this activity is an analytical process to process data so that it can be visualized. The coding process is not a technical process, but rather an analysis process in qualitative data processing. In the process of interpreting the data, several findings were found that answered the problem formulation of this study and are discussed further in the next chapter.

5. Findings

Qualitative research requires in-depth disclosure of information through informants, therefore the selection of the right informant is needed (Creswell, 2015). There is no exact number to determine the number of respondents in qualitative research, but the phenomenological study suggests 5-25 respondents (Cresswell, 1998), Morse suggests at least 6 respondents (J. . Morse, 1994) and at least 6 to 12 respondents (Boddy, 2016). This study involved 9 informants with stringent requirements in their selection, for example having the main background management of e-commerce with Unicorn status. The topic of this research is about the sustainability of e-commerce

widely by involving respondents from various backgrounds. However, there is a limited number of participants in the supporting respondent criteria. Further research is needed to deepen exploration of a certain category of e-commerce by increasing the number of respondents in that category.

Table 7 shows the list of informants with different backgrounds who have met the requirements to participate in this research:

Table 7 Informant Classification

Number	Classification	Backgrounds	Initial
1	Management Marketplace	Management of e-commerce leading in Indonesia	INF1
2			INF2
3	Seller	Owner, Business Management	INF3
4	Digital Business Expert	Senior Manager of Ride Healing	INF4
5	Consumer	Skincare online and offline Director	INF5
6		Workers	INF6
7	Government	Department of financial and international supervision	INF7
8	Legal Observer	Lecturer in Law	INF8
9	Digital Business Consultant	Coordinator content digital Platform	INF9

Scenarios were given to informants to equalize perceptions in the interview process. The scenarios that will be informed to the informants are shown in Table 8.

Table 8. The sustainability scenario in e-commerce

Scenario	Content
Scenario 1 Economic Sustainability	The government plans to impose taxes on e-commerce
Scenario 2 Environment Sustainability	Waste e-commerce is a global e-commerce problem. Waste is meant by packaging and shipping of e-commerce products
Scenario 3 Social Sustainability	In Indonesia, e-commerce complaints are in second place after property.
Scenario 4 Intention to use e-commerce	The growth of e-commerce in Indonesia ranks 1 in Southeast Asia. The number of unicorns in Indonesia is an indicator of e-commerce acceptance.

Based on the above scenario, several categories are identified in this stage and further categorized based on themes and concepts obtained from the processed data, see Table 6. Identification of 16 themes from the results of the interview (see Table 6), including Functional Value, Social Value,

Emotional Value , Epistemic value, Conditional value, Technical Dimension of the UI, Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Trust, Habit, Economic Sustainability, Social Sustainability, Environment Sustainability, Regulation, processed and produced 17 findings presented in the Table 9

Table 9 Research Findings

No	Description	Finding
Perceived Human on Intention to use e-commerce (1)		
1	Perceived Human (Functional Value, Emotional Value, Epistemic Value) affects the intention to use e-commerce.	Finding 1
2	Social Value has no effect on the intention to use e-commerce	Finding 2
Technical Dimension for e-commerce identity (2)		
1	Technical dimensions of the UI (Architecture and navigation, content, accessibility and customer, service, design, purchasing process) as an embedded part of the system which is a prerequisite for a website application	Finding 3
2	UX provides a shopping experience on e-commerce	Finding 4
Intention to use encourages sustainability e-commerce (3)		
1	Intention to use (Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition) affects sustainability	Finding 5
2	Trust is an embedded part of e-commerce	Finding 6
Integration of Economic Sustainability (4.a)		
1	The application of tax hinders the growth of e-commerce	Finding 7
2	Relatively low purchasing power	Finding 7
3	Relatively low growth & productivity	Finding 7
4	Burning money is high in the discount image phase	Finding 8
Integration Social Sustainability (4.b)		
1	Employment	Finding 9
2	Fraud Management	Finding 9
3	Complaint	Finding 9
4	The existence of counterfeit (fake) product markets as one of the aspects of social sustainability in e-commerce	Finding 10
Integration Environment Sustainability (4.c)		
1	Shipping reduces environmental emissions	Finding 11
2	Packaging has not been standardized	Finding 11
3	Logistics (delivery) is a driving factor for intention to use e-commerce	Finding 12
4	Security is a driving factor for packaging integration in the Sustainability environment	Finding 13
5	Awareness is a driving factor for sustainability environment (packaging)	Finding 14
Sustainability implementation is a factor that e-commerce should pay attention to in the mature phase (5)		Finding 15
The use of e-commerce has become a habit in society (6)		Finding 16
Regulation is a driving factor for sustainability (7)		Finding 17

This study reveals 17 findings, which are divided into the entire category. In the perceived human dimension, it is revealed that Functional Value, Emotional Value, and Epistemic Value have an effect on the intention to use e-commerce. Meanwhile, Social Value has no effect on the intention to use e-commerce. In the Technical dimension, it is revealed that the UI (Architecture and navigation, Content, Accessibility and customer, service, Design, Purchasing process) is an embedded part of the system which is a prerequisite for a website application. In e-commerce, the theme provides a shopping experience in e-commerce. Thus there are 2 supporting variables of the Engineering dimension, namely the UI and UX. The findings of Intention to use, namely Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition have an effect on sustainability and "trust" is an embedded part of e-commerce. In general, in the sustainability dimensions, it is revealed that there is a need for comprehensive e-commerce regulations that regulate all aspects of sustainability. Detailed discussion of findings in the discussion chapter. Based on the findings, the e-commerce usage intention model towards sustainability has changed, presented in Figure 4. The research reveals 16 themes about sustainability in e-commerce. This theme is proposed as a change or addition of variables to the previous model. The addition and change of this variable is presented in Figure 4.

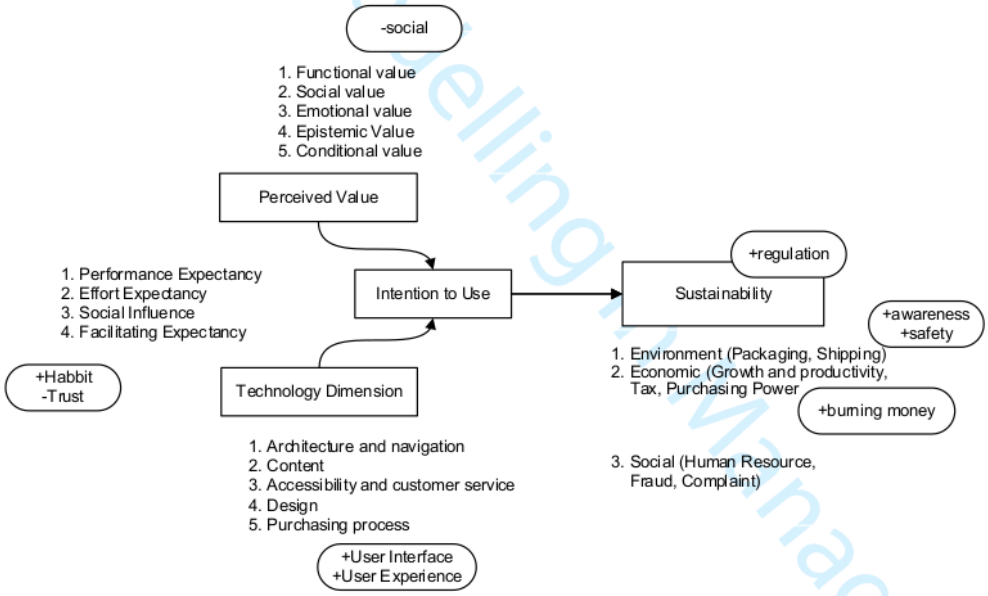

Figure 4 Conceptual Model Modification

In the perceived value, there are changes in the social value variable, Figure 4.The results show that the use of e-commerce is more of a necessity than a social influence (Indozone, 2019). The technology dimension reveals the UI and UX as an integral part of e-commerce. The shopping experience is an important part of creating an identity (Hero Soft Media, 2019; Kompas, 2018). In the intention to use, it is revealed that the use of e-commerce has become a new habit. Meanwhile, "trust" is a variable inherent in e-commerce. At the introductory stage of e-commerce, “trust” is needed to ensure the existence of e-commerce. The absence of a comprehensive e-commerce

regulation, the integration of e-commerce towards sustainability has not been implemented optimally

5.1 Checking the validity of research data

This study uses triangulation techniques to ensure the validity of the research data. Information on the findings of this study was obtained from informants with different backgrounds, see Table 7. Checking the results of interviews with previous research and current phenomena is shown in Table 10.

Table 10 Conformity of interview results with previous research and current phenomena

Previous Research	(Saetang, 2017) (T. K. Huang & Fu, 2009) (Mangiaracina et al., 2009)
Phenomenon	An article entitled 7 Simple Habits of Highly Successful UX designers (Design, 2019) explains about 7 habits that UX designers use to achieve success. This article on UX (*Why UX Design Is Key to Online Marketplace Success*, 2019) explains that UX design can make or break the e-commerce market.
Interview result	**INF1.** We use a UI with international standard. We make sure customers feel comfortable using this platform **INF2.** The market segment is reflected in the appearance of the application, for example e-commerce "A" has a female target market, e-commerce "B" has a target market for families. **INF3.** The product which I sell is for woman, that is way I choose this e-commerce not the other e-commerce **INF4**. ... UI and UX reflect the e-commerce identity. E-commerce identity is represented by how the UI and UX are. There is e-commerce that is identical to women, and e-commerce that is synonymous with family, this is proof that UI and UX can determine the identity of an e-commerce. **INF5**. I prefer to shop at Shopee, because in that e-commerce, all my needs are available. **INF6**. I prefer to shop at Bukalapak and Tokopedia, because it's simple. **INF7**. The appearance of all platforms is almost the same. Nice and comfortable, like shopping at the mall **INF8**. All platforms are good. I often use Tokopedia because it's convenient.

	INF9. I have transacted on all platforms. It is clear that the UI display market segments, such as e-commerce "A" are preferred by women and children

UX design is the process of designing products that are useful, easy to use, and fun to interact with. It aims to improve the experience people have when interacting with the system, and ensure users find value in it. UI and UX are very important for the success of e-commerce (*Why UX Design Is Key to Online Marketplace Success*, 2019), therefore caution is needed in determining UX (Design, 2019). Detailed understanding of the UI drives the success of e-commerce websites (Haryanti & Pribadi, 2019; T. K. Huang & Fu, 2009). It is necessary to have a precise strategy in using UX in e-commerce (Saetang, 2017). UX in using the system depends on the suitability of the UX (Mangiaracina et al., 2015). There is a correspondence between the results of the interview with previous research on UI and UX. The results of the interview about sustainability, it was revealed that the informants agreed that public awareness of the management of plastic waste from e-commerce packaging was still low. Public awareness is still low in managing plastic waste (Swa.co.id, 2019). Environmental awareness education needs to be carried out to increase public awareness of environmental problems (Macchion et al., 2017). The need to regulate Plastic Waste (Metrobali, 2019) to encourage public awareness of packaging waste. The existence of e-commerce has changed people's shopping habits. The informants agreed that the increase in prices caused by taxes did not make consumers leave e-commerce. This also confirms that digital services have succeeded in changing people's habits (Eka, 2019; Haryanti, 2020).

5.2 Triangulation of data collection technique

Technique triangulation is done by checking the data again with the same sources but using different techniques. In this study, the researcher gave different questions to the speakers:
Initial question: "how should e-commerce waste like plastic be managed?"
Technical triangulation question: "What do you do with the packaging of the product that you buy from the online shop?"
Triangulation of Data Collection Time
To test the consistency of the answers from the informants, the same question was asked again at different times. Consistent answers from informants were generated even though the same question was asked at different times. Table 11 shows examples of testing data at different times

Table 11 Time triangulation

Date	Interview	Informant	
	Packaging	Supply Chain Manager at E-commerce	Head of Legal at Ecommerce
February 20, 2020	What do you think is the alternative use of recyclable packaging to reduce e-commerce waste?	INF 1: The use of recyclable packaging costs money. It needs awareness of all parties about environmentally friendly packaging and	INF 2: recycling has been done in a small percentage such as using recycled cardboard for packaging. Environmentally friendly packaging is an interesting

		this has not yet been achieved. In the mature e-commerce phase, recyclable packaging needs to be considered for implementation.	innovation to be implemented in e-commerce in the future.
February 21, 2020	What do you think about the "Go green" campaign or save our earth as a form of education for e-commerce users	INF 1: I think the save our earth campaign is not yet possible to implement, e-commerce is currently in the growth phase, increasing sales is a priority.	INF2: Good for innovation but not now, maybe in the future

Informants' answers to the same question at different times proved consistent. Table 11 shows that in general the campaign environment is still not possible to implement in e-commerce. Environmental issues will become attractive e-commerce innovations in the future, in the mature e-commerce phase. This study uses transferability testing. At this stage the process is carried out by compiling research reports in a sequence, detail, clearly and systematically so that they are easy to understand. Reports are prepared based on the activities carried out by researchers during the data collection process to processing the results and research findings. The dependability test is carried out by examining the entire research process. Research is said to be reliable if other people can repeat / replicate the research process. An example of the dependability test is presented in Table 12 below:

Table 12 Dependability Test

Dimension:	Environment Sustainability: Packaging
Question	What do you think about reducing e-commerce waste in packaging with environmentally packaging?
Informant's Answer INF 1	INF1: currently it cannot be done, the reason is (1) the e-commerce stage is still growing, (2) It needs environmental awareness from the national level.
Informant's Answer INF 4	INF4: it is still difficult because, (1) people's habit to use plastic or environmentally unfriendly goods, it is difficult to be forced to change to environmentally friendly packaging, (2) it needs broad awareness, outside the e-commerce ecosystem, namely public awareness ..

Confirm ability test aims to test the objectivity of the test results through the agreement of the informants. An example of the confirm ability test in this study is presented in Table 13

Table 13 Confirm ability testing

Dimension: Environment Sustainability	Questions:	Informant's Answer
Packaging	What do you think about waste e-commerce in packaging with environmentally packaging?	INF1. It takes environmental awareness together and regulation on a national scale INF2. The need for awareness and strictness of regulations INF3. It is necessary to educate the public to be aware of the environment and there must be strict regulations INF4. Build awareness of the community ecosystem in general and strengthened by regulation.

6. Discussion

The results of the study found 16 themes summarized in 4 dimensions, namely perceived value, technology dimensions, use intention, and sustainability. Finding 1 shows the similarity of the Perceived Value variables with previous research, namely Functional Value, Emotional Value, Epistemic Value, and Conditional Value which affect the intention to use e-commerce. Whereas in finding 2 it is revealed that social values do not affect the intention to use e-commerce. Keywords such as "need", "can buy online", "have no effect" indicate that the use of e-commerce is no longer due to a certain image or social value, but the products sold by e-commerce have met consumer needs. This is in line with research (P et al., 2010; Rifai & Suryani, 2016). But for sellers, "Public Figures" can increase sales. This difference in interpretation is interesting to study in the future, so that changes in public acceptance of e-commerce can be revealed, especially in the aspect of social values. Subsequent discoveries revealed variable changes in the Technological Dimension. Research reveals that the technology dimension (Hasan et al., 2012) has developed into a unified UI and UX. Finding 3 reveals that the UI already has certain standards for applications or websites. This is in line with the existence of Website standards such as the ISO / IEC 40500: 2012 standard [Web Accessibility Guidelines (WCAG) 2.0]. UI and UX are an important part of online business. UI is created by customizing the purpose of UX. Obviously, finding 4 reveals that UX creates an e-commerce identity. The choice of UX depends on the selected segment, segment behavior, and various other psychological approaches. These findings also provide opportunities for future research on UX for identity formation, from both human and technical disciplines. Finding 5 reveals that "intention to use" affects the sustainability of e-commerce. The themes revealed on the intention to use have similarities with the UTAUT 2 model variables (Performance Expectancy, Effort Expectancy, Social Influence, facilitating Condition. The intention to use e-commerce is related to the dimensions of sustainability such as economy, environment and social. For example, purchasing products online cannot be separated from delivery and packaging (environment sustainability). However, there are still few studies that link the intention to use with sustainability (Biagi & Falk, 2017; Chen & Lin, 2015; Hong, 2018). The "trust" variable is added to the "intention to use". Finding 6 reveals that trust is an embedded part of e-commerce. In general, variable trust is an important factor in the early phases of e-commerce to ensure the existence of e-commerce, now e-commerce is widely known and used. Value and identity are an important part of e-commerce today, as reviewed by previous findings. This is interesting because there are still groups of people who do not believe in e-commerce, cashless payments, and do not see / hold goods directly. Future research is needed to explore the role of the

Trust in current e-commerce in Indonesia and the readiness of society to use cashless payments. The growth of e-commerce in Indonesia is the highest in the world with a growth rate of 78% in 2018, see Table 1. Integration of economic sustainability into e-commerce is necessary in line with the development of e-commerce. Informants agree that there are still many potentials e-commerce provides opportunities for e-commerce to continue to develop in the future. Finding 7 reveals that the implementation of tax in e-commerce will have a negative impact on e-commerce growth and seller sustainability now days. However, the buyer's reliance on e-commerce allows the imposition of taxes. Consideration is needed to determine taxes on e-commerce, for example product classification or seller classification. Meanwhile, imported products are subject to lower taxes as the implementation of "low barrier cost" rule. The tax determination should consider competition between local products, imported products and low purchasing power. Increasing the productivity of local sellers needs to be increased both in terms of production scale and product quality. Further research is needed to see the potential of the e-commerce market. In the early days of e-commerce, low prices were the power to get customers. This low price is supported by many incentive programs, sales incentives, and delivery incentives. Therefore, finding 8 reveals incentives (burning money) to be the driving factor for e-commerce growth in the growth phase. Informants revealed that incentives are aimed at creating habits and dependencies. Finding 9 regarding the dimensions of social sustainability requires consumer understanding of complaints and the escalation of complaints according to the level of urgency. The e-commerce platform has provided reporting facilities, but it is not yet known to consumers. Online scams include the sale of counterfeit products. Finding 10 reveals that the application of brand protection regulations is not optimal. However, there is a phenomenon of buying counterfeit products that buyers deliberately do without feeling disadvantaged, further research is needed to reveal this phenomenon. Finding 11 reveals that the presence of e-commerce can reduce environmental emissions due to the use of consumers' personal transportation. Meanwhile, various e-commerce efforts have been made in various innovations to minimize emissions generated by shipping, for example using environmentally friendly modes of transportation, but have not received support from the government. Findings 12 reveal that logistics (delivery) is a driving factor for the intention to use e-commerce. This is in line with “Facilitating Condition” (Venkatesh et al., 2003; Yeow & Loo, 2011; Zhou et al., 2010), that logistics has the most important influence on consumer interest in using e-commerce. Shipping and packaging are integrated into e-commerce transactions. Plastic waste in Indonesia ranks second, but the switch to non-plastic for packaging has not yet been made. It is revealed from finding 13 that the safety of goods (avoiding damage) is the main focus compared to environmental issues. In Indonesia, there is a plastic diet regulation, but it has not been fully implemented by all people. Finding 14 reveals that awareness is a driving factor for environmental sustainability. The informants agree that the e-commerce phase has an effect on the implementation of sustainability. Finding 15 reveals that the implementation of sustainability is a factor that concerns e-commerce in its mature phase. Even though e-commerce in Indonesia is currently in a growth phase, the potential for e-commerce in Indonesia has not all been seen. The ease and convenience offered by e-commerce has changed people's shopping habits. Findings 16 reveal that the use of e-commerce has become a habit in society. Finding 17 reveals the need for e-commerce regulations to regulate e-commerce activities. Economic, environmental and social issues in the dimensions of sustainability need to be regulated by the government. With the existence of sustainability regulations, e-commerce waste processing and public awareness of the environment can be increased.

7. Conclusion

This research reveals several findings about e-commerce integration with sustainability. This study proposes changes and additional variables in the model of e-commerce use in sustainability. The theoretical contribution of this research is to provide an exploratory research model of the integration of the use of e-commerce from human acceptance and engineering dimensions to sustainability. Implementation of qualitative research designs to explore the phenomenon of e-commerce development in sustainability. The proposed model development uses theory and references from previous research. The model is built based on perceived human dimension, technical dimensions, the intention to use with the UTAUT approach and Sustainability. This study reveals a change in the Social Value variable in the perceived human dimension. E-commerce is a shopping platform that can meet customer needs. Customers shop on e-commerce not because of the influence of others, but because the necessary needs are available in e-commerce. Meanwhile, from the seller's perspective, the use of influencers is a dominant factor in increasing sales. This research provides additional references on UTAUT development. Various studies propose "Trust" in the development of UTAUT, but this research reveals that trust is in the early phase of e-commerce. This study proposes that "Trust" in technology acceptance theory (UTAUT) is embedded or a requirement for the existence of e-commerce, not as a separate variable. The trust-building phase or the “trust” phase is the initial phase of the introduction of e-commerce, and is no longer relevant at the next stage. Currently, people have felt the comfort and convenience of e-commerce services, and believe in transacting through e-commerce. Therefore, the growth of e-commerce is increasing. This study proposes an additional technical dimension in the preparation to use intention that previously focused on perceived human dimension. UI and UX become a unified variable to support e-commerce identity. The ecommerce market segment is reflected in the combination of UI and UX, for example e-commerce with a market for women and children, families or teenagers. This study presents references to Economic Sustainability in e-commerce, including growth and productivity, tax, purchasing power. An additional variable in economic sustainability is incentives ("burning money"), which is needed in the initial phase of introducing e-commerce with the aim of creating a habit to use e-commerce because of its affordable prices. Furthermore, in the Social Sustainability e-commerce, this study reveals that there is a phenomenon of the counterfeit market. This shows that the implementation of brand regulations has not been optimal. Further research is needed to explore the existence of counterfeit product markets. This study proposes an additional variable "nation awareness" on Environment Sustainability. Environment Sustainability variables include shipping and Packaging. Overall awareness is needed in maintaining environmental sustainability. This study produces references to adjusting sustainability integration in e-commerce for developing countries, which are presented in Table 14. This research is expected to contribute to research on gaps / gaps or deficiencies in research, especially Sustainability. In general, Sustainability (economic, social, environment) is studied in developed countries and is relatively limited considering the formal emphasis on Sustainability issues in International starting in 2015 and gradually. To add to the completeness of the reference, this study uses secondary data and is supported by the selection of informants in the leading management marketplace in Indonesia

6.1 Managerial implications

The practical contribution resulting from this research is the integration of e-commerce in sustainability. The findings presented in Table 9 are then processed based on research objectives,

integration of e-commerce in sustainability. E-commerce integration towards sustainability as managerial implications is presented in Table 14.

Table 14 Trade Off sustainability in e-commerce

Dimension	Themes	Findings	Trade Off
Sustainability	Determining sustainability through the constructs: Environmental, Economic and Social (Oláh et al., 2018; Pradhan et al., 2017; United Nations Member States, 2015).		
Economic Sustainability	*Growth*	1. The need for government protection against competition with imported goods. 2. Instability of production raw goods	1. Be selective about imported goods 2. Ensuring the stability of raw materials (example: chili for the chili sauce business)
	Tax	The timing of tax application and the category of tax application need to be evaluated	1. Taxation on mature sellers / resellers with a specified minimum turnover
	Purchasing Power	The purchasing power is relatively low, so it is price sensitive	1. Improve community welfare (UMR) 2. Incentives for sellers (SMEs) so that the selling price is not too expensive
Social Sustainability	*Employment*	High labour absorption but low productivity	1. Worker training
	Fraud	Fraud is proportional to traffic	1. Minimizing the possibility of fraud 2. System optimization
	Complaint	It needs to be selective in dealing with the complaint due to limited resources	1. Ranking the urgency of the complaint
Environment Sustainability	*Packaging*	Low public awareness of plastic waste	1. Regulation of the use of plastics 2. Provision of organic and non-organic waste bins 3. Provide pro-environment seller incentives
	Shipping	Aggregation of private vehicle emissions and e-commerce	1. Provide a choice of transportation modes 2. Collecting items to be purchased (in 1x transaction)

Table 14 illustrates the integration of e-commerce with sustainability that can be applied by e-commerce stakeholders. Comprehensive e-commerce regulations facilitate sustainable e-commerce integration (economic, social, environment).

6.2 Limitation and further studies

In conducting this research, researchers have limitations, including: Prolonged Engagement. This research spends sufficient time to explore e-commerce, especially marketplaces in Indonesia, because there are many things that have not been revealed, for this we need research limitations. This research is focused on the trade-off of the intention to use e-commerce for sustainability by limiting the variables in each dimensions so that the research results can be presented in detail. In general, sustainability (economic, social, environment) is studied in developed countries and is relatively limited because Sustainability was officially the UN's sustainability development program in 2015. To add to the completeness of references, this study uses secondary data and supports the selection of informants in leading marketplace management in Indonesia. Indonesia. E-commerce has experienced a significant development starting in 2015 with public acceptance of the marketplace (Tokopedia, Shopee, Lazada, JD.id). Until this research was conducted, there were no specific regulations regarding e-commerce in Indonesia, for this reason this research was supported by informants from the government. The WHO has formulated the regulation of sustainability issues, especially in both electronic and free trade, but its implementation is adjusted to the policies of participating countries. The problem in finding references is due to different regulations on sustainability implementation. This study focuses on Indonesia. To produce a broad perspective of sustainability in e-commerce, this research involves various stakeholders in e-commerce (Bernard, 2020; Stakeholdermap.com, 2015), such as Management, buyers, sellers, government, etc. The selection of respondents from various criteria constitutes a comprehensive set of e-commerce information that is needed. However, there is a limitation part of this research on the number of supporting respondents such as government, consultants, etc. Further research is needed with the addition of the number of respondents in a certain category to reveal in depth about e-commerce from the point of view of that category.

6.2 Further Research

Research can be refined using quantitative methods to confirm the qualitative research that has been done. Nowadays e-commerce is starting to show its identity through UX, market segments, values and habits and leaving a discount image. More research is needed to further explore the success and time needed to achieve this goal. In addition, it is necessary to explore the UX expected by the e-commerce market segment. This study reveals that "trust" is no longer a separate factor affecting e-commerce because the phase of building trust in e-commerce has passed. Further research is needed to find out how the relationship of trust and what factors are equivalent to trust in influencing the intention to use e-commerce. The results of this study reveal that there is no seriousness of state policy holders in taking part in determining the direction of e-commerce as a whole, this is evidenced by the absence of e-commerce regulations in Indonesia, but some efforts to implement tax regulations have been made since 2018, however Until this study is conducted, 2020 has not been realized. Further research is needed to explore regulatory requirements for optimal e-commerce growth in Indonesia. This study reveals that sustainability has not become a concern for e-commerce in Indonesia, especially since the e-commerce stage is still in the Growth stage. Further research is needed to explore the stages of e-commerce and the factors that influence them.

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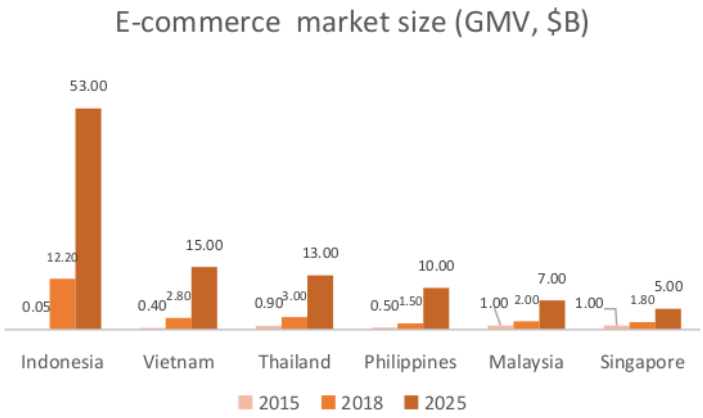

Figure 1 E-commerce Market Size (Google et al., 2019)

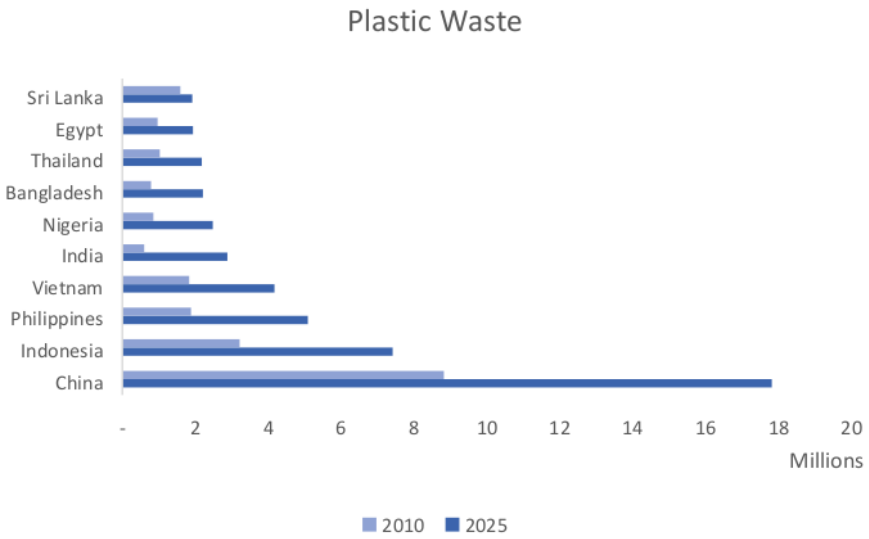

Figure 2 Plastic Waste (Jambeck et al., 2015)

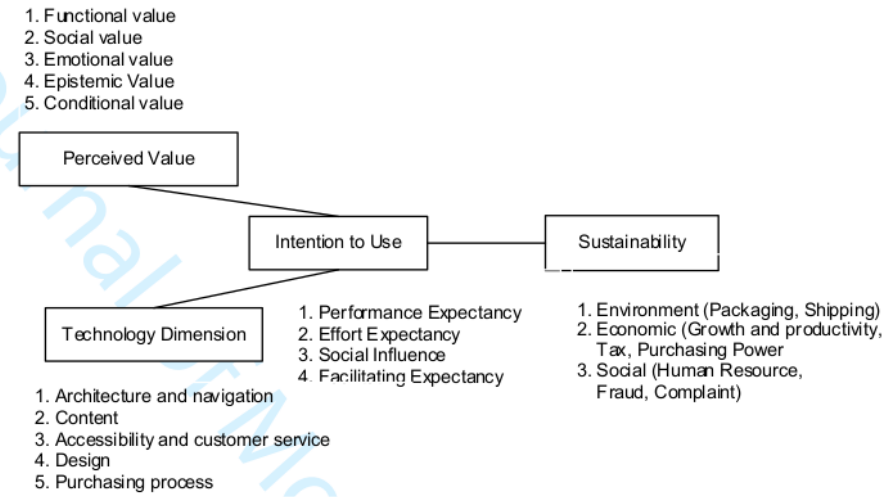

Figure 3 Conceptual Model

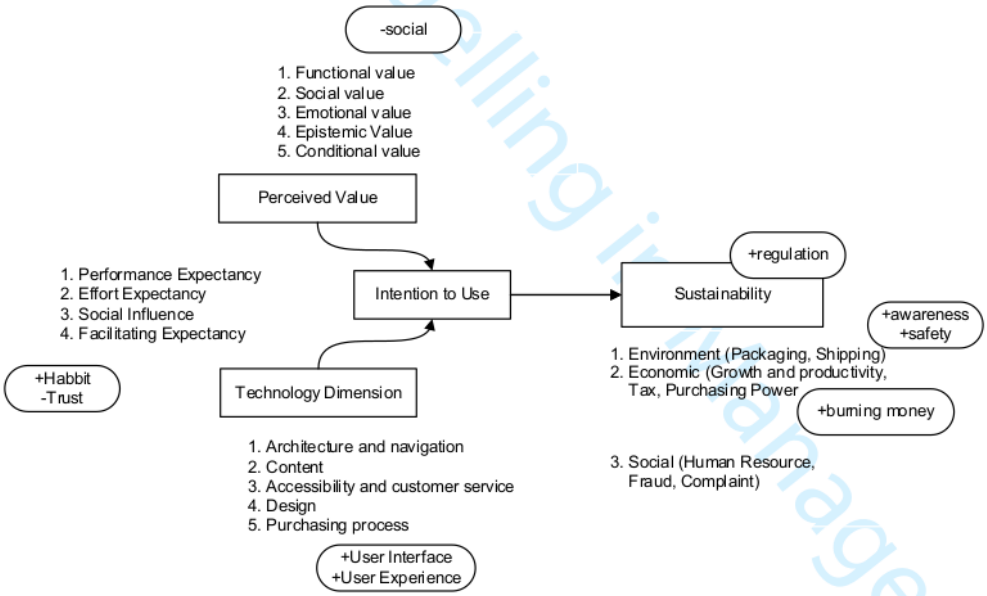

Figure 4 Conceptual Model Modification

Table 1 Indonesian e-commerce data

Aspec	Description	Reference
economic growth	78% by 2018, number 1 in the world	(Databoks.Katadata, 2019a)
e-commerce adoption	As many as 90 percent of internet users aged 16 to 64 years in Indonesia have purchased products and services online. The highest-commerce adoption in the world	(cnnindonesia.com, 2020)
e-commerce transaction	113T/month in 2019. From the total online spending of US $ 8 billion in 2017, it increased to US $ 55 billion to US $ 65 billion in 2020	(Bisnis.tempo, 2019), (Das et al., 2018)
Plastic waste	3,22Million metric tons/year by 2018. Number 2 in the world after China	(Post, 2018)
Labour	+16 million e-commerce supporting job	(Techinasia, 2019)
Shipping	1.6 billion transaction packages via e-commerce are sent per year in 2022	(Databoks.Katadata, 2019b), (Das et al., 2018)

Table 2 Acceptance theory and additional variable

Model	Founder	Components
UTAUT	(Venkatesh et al., 2003)	Performance expectancy, effort expectancy, social influence, facilitating conditions
UTAUT2	(Venkatesh *et al.,* 2012)	UTAUT + hedonic motivation, price value, habit
Additional variable	(Chiu et al., 2010) (White Baker et al., 2019) (Gu et al., 2019) (Reyes-Menendez et al., 2018) (J. B. Kim, 2012) (Krontiris et al., 2016) (Ofori et al., 2018) (Schaupp et al., 2010) (Chan et al., 2012) (Pascual-Miguel et al., 2015) (Moon & Hwang, 2018) (Sanny, 2017) (Sim et al., 2019)	UTAUT + Technical
Additional variable	(Omar et al., 2017) (Sabi et al., 2016) (Chan et al., 2012) (Krontiris et al., 2016) (Khalil Moghaddam & Khatoon-Abadi, 2013)(Pazalos et al., 2012) (Chan et al., 2012) (Zheng et al., 2013)	UTAUT + Trust

Table 3 Previous Research

Number	Topic	References	Summary
1	Intention to use	(Chen & Lin, 2015; Hong, 2018; Lin et al., 2019a;	These literatures discuss about the

		Mufidah et al., 2018; Nia et al., 2018; Prayoonphan & Xu, 2019; Xiao et al., 2019)	intention to use technology with various theories.
2	Sustainability	(Biagi & Falk, 2017; Carrillo et al., 2014; Nisar & Prabhakar, 2017; Oláh et al., 2018; (Biagi & Falk, 2017; Carrillo et al., 2014; Macchion et al., 2017; Mangalaraj et al., 2014; Nisar & Prabhakar, 2017; Oláh et al., 2018; Van Loon et al., 2015; Wang & Huang, 2018; H. Yang et al., 2016; Van Loon et al., 2015; Wang & Huang, 2018; Mangiaracina et al., 2015)	These literatures discuss about the dimension of sustainability: environment, social and economic

Table 4 Literature Search

Keywords	Resource		In topic		TRA	TPB	TAM	UTAUT
e-commerce, electronic commerce, electronic market, digital commerce, digital market	Google Scholar	11000	Intention Sustainable Adaption Technology Theory	4630	202	74	436	35
	Science direct	3921		1205	34	15	44	11
	MDPI	3899		783	20	23	25	8
	Springer	7915		1527	121	101	66	6
	Emerald	6552		2319	41	45	130	25
	IEEE	8813		357	44	34	15	6

Table 5 Document Review

No	Category	Description	Source
1	Perceived Human Dimension	1. Definition of perceived Human 2. Perceived Human Dimension	(Chen & Lin, 2015; Ledden et al., 2007; Sheth et al., 1991; Sweeney & Soutar, 2001), papers, online articles
2	Qualitative Research	1. Qualitative research design 2. Qualitative research stages 3. Qualitative data collection procedures 4. Analysis and report	"Sample *size* for qualitative research", Qualitative Market Research: An International Journal (Boddy, 2016; Creswell, 2015)

3	Technology Dimension	1. The factor of technological dimension in e-commerce 2. Evaluator of technical dimensions in e-commerce	(Cohen & Areni, 1991; Ganguly et al., 2010; Hasan et al., 2012; Z. Huang & Benyoucef, 2015; Lee & Benbasat, 2003; Reeves & Nass, 1998), papers, online articles
4	Acceptance Theory	1. Evolution of acceptance theory 2. Identification of variables in acceptance theory	(Lin et al., 2019b; Oláh et al., 2018; Venkatesh et al., 2003, 2016; Williams et al., 2015), papers, online articles
5	Sustainability	1. Sustainability Dimensions 2. Sustainability Policy 3. E-commerce Regulation	(Nagy et al., 2018; Pradhan et al., 2017; United Nations Member States, 2015), regulation, policy, papers, online articles, website

Table 6 Identification of themes and concepts about sustainability in e-commerce

Themes	The concepts explored
Functional value	*Alternative place for buying and selling*
	Effectiveness
Social Value	*Needs*
	Personalized Approach
	Public Figure Endorsement
Emotional value	*Window Shopping (for refreshment)*
Epistemic value	*Minimal Effort*
Conditional value	*No Queue*
	No Transportation Needed
	Fast Process
Technical dimension (User Interiface)	*Standard UI*
	Good Customer Journey (UX)
	Strong and targeted identity based branding
	Familiarity
Performance Expectancy	*Time Efficiency*
	Practical use
Effort Expectancy	*Convenience*
	Ease to use
Social Influence	*Social influence*
	Interesting ad
Facilitating Conditions	*Fast delivery*
	Many logistical choices
Trust	*Confidence in marketplace*
	Introduction phase has passed
Habit	*Dependency*
Economic Sustainability	*Growth and productivity*
	Tax

Social Sustainability	*Purchasing Power* *Many discount (Burning Money)* *Job Creation* *Possibility of Fraud* *Complaint Handling*
Environment Sustainability	*Delivery Packaging* *Nation Awareness* *Shipping Process* *Safety in Delivery*
Regulation	*There is no e-commerce regulation yet* *Regulations regarding trademark protection have not been properly implemented* *Plastic diet has not been applied nationally*

Table 7 Informant Classification

NO	Classification	Backgrounds	Initial
1	Management Marketplace	Management of e-commerce leading in Indonesia	INF1
2			INF2
3	Seller	Owner, Business Management	INF3
4	Digital Business Expert	Senior Manager of Ride Healing	INF4
5	Consumer	Skincare online and offline Director	INF5
6		Workers	INF6
7	Government	Department of financial and international supervision	INF7
8	Legal Observer	Lecturer in Law	INF8
9	Digital Business Consultant	Coordinator content digital Platform	INF9

Table 8 The Sustainability scenario in e-commerce

Scenario	Content
Scenario 1 Economic Sustainability	The government plans to impose taxes on e-commerce
Scenario 2 Environment Sustainability	Waste e-commerce is a global e-commerce problem. Waste is meant by packaging and shipping of e-commerce products
Scenario 3 Social Sustainability	In Indonesia, e-commerce complaints are in second place after property.

Scenario 4 Intention to use e-commerce	The growth of e-commerce in Indonesia ranks 1 in Southeast Asia. The number of unicorns in Indonesia is an indicator of e-commerce acceptance.

Table 9 Research Findings

No	Description	Finding
Perceived Human on Intention to use e-commerce (1)		
1	Perceived Human (Functional Value, Emotional Value, Epistemic Value) affects the intention to use e-commerce.	Finding 1
2	Social Value has no effect on the intention to use e-commerce	Finding 2
Technical Dimension for e-commerce identity (2)		
1	Technical dimensions of the UI (Architecture and navigation, content, accessibility and customer, service, design, purchasing process) as an embedded part of the system which is a prerequisite for a website application	Finding 3
2	UX provides a shopping experience on e-commerce	Finding 4
Intention to use encourages sustainability e-commerce (3)		
1	Intention to use (Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition) affects sustainability	Finding 5
2	Trust is an embedded part of e-commerce	Finding 6
Integration of Economic Sustainability (4.a)		
1	The application of tax hinders the growth of e-commerce	Finding 7
2	Relatively low purchasing power	Finding 7
3	Relatively low growth & productivity	Finding 7
4	Burning money is high in the discount image phase	Finding 8
Integration Social Sustainability (4.b)		
1	Employment	Finding 9
2	Fraud Management	Finding 9
3	Complaint	Finding 9
4	The existence of counterfeit (fake) product markets as one of the aspects of social sustainability in e-commerce	Finding 10
Integration Environment Sustainability (4.c)		
1	Shipping reduces environmental emissions	Finding 11
2	Packaging has not been standardized	Finding 11
3	Logistics (delivery) is a driving factor for intention to use e-commerce	Finding 12
4	Security is a driving factor for packaging integration in the Sustainability environment	Finding 13
5	Awareness is a driving factor for sustainability environment (packaging)	Finding 14
Sustainability implementation is a factor that e-commerce should pay attention to in the mature phase (5)		Finding 15
The use of e-commerce has become a habit in society (6)		Finding 16
Regulation is a driving factor for sustainability (7)		Finding 17

Table 10 Conformity of interview results with previous research and current phenomena

Previous Research	(Saetang, 2017) (T. K. Huang & Fu, 2009) (Mangiaracina et al., 2009)
Phenomenon	An article entitled 7 Simple Habits of Highly Successful UX designers (Design, 2019) explains about 7 habits that UX designers use to achieve success. This article on UX (*Why UX Design Is Key to Online Marketplace Success*, 2019) explains that UX design can make or break the e-commerce market.
Interview result	**INF1.** We use a UI with international standard. We make sure customers feel comfortable using this platform **INF2.** The market segment is reflected in the appearance of the application, for example e-commerce "A" has a female target market, e-commerce "B" has a target market for families. **INF3.** The product which I sell is for woman, that is way I choose this e-commerce not the other e-commerce **INF4**. ... UI and UX reflect the e-commerce identity. E-commerce identity is represented by how the UI and UX are. There is e-commerce that is identical to women, and e-commerce that is synonymous with family, this is proof that UI and UX can determine the identity of an e-commerce. **INF5**. I prefer to shop at Shopee, because in that e-commerce, all my needs are available. **INF6**. I prefer to shop at Bukalapak and Tokopedia, because it's simple. **INF7**. The appearance of all platforms is almost the same. Nice and comfortable, like shopping at the mall **INF8**. All platforms are good. I often use Tokopedia because it's convenient. **INF9.** I have transacted on all platforms. It is clear that the UI display market segments, such as e-commerce "A" are preferred by women and children

Table 11 Time triangulation

Date	Interview	Informant	
	Packaging	Supply Chain Manager at E-commerce	Head of Legal at Ecommerce
February 20, 2020	What do you think is the alternative use of recyclable packaging to reduce e-commerce waste?	INF 1: The use of recyclable packaging costs money. It needs awareness of all parties about environmentally friendly packaging and this has not yet been achieved. In the mature e-commerce phase, recyclable packaging needs to be considered for implementation.	INF 2: recycling has been done in a small percentage such as using recycled cardboard for packaging. Environmentally friendly packaging is an interesting innovation to be implemented in e-commerce in the future.
February 21, 2020	What do you think about the "Go green" campaign or save our earth as a form of education for e-commerce users	INF 1: I think the save our earth campaign is not yet possible to implement, e-commerce is currently in the growth phase, increasing sales is a priority.	INF2: Good for innovation but not now, maybe in the future

Table 12 Dependability Test

Dimension:	Environment Sustainability: Packaging
Question	What do you think about reducing e-commerce waste in packaging with environmentally packaging?
Informant's Answer INF 1	INF1: currently it cannot be done, the reason is (1) the e-commerce stage is still growing, (2) It needs environmental awareness from the national level.
Informant's Answer INF 4	INF4: it is still difficult because, (1) people's habit of using plastic or environmentally unfriendly goods, it is difficult to be forced to change to environmentally friendly packaging, (2) it needs broad awareness, outside the e-commerce ecosystem, namely public awareness ..

Table 13 Confirm ability testing

Dimension: Environment Sustainability	Questions:	Informant's Answer
Packaging	What do you think about waste e-commerce in packaging with environmentally packaging?	INF1. It takes environmental awareness together and regulation on a national scale INF2. The need for awareness and strictness of regulations INF3. It is necessary to educate the public to be aware of the environment and there must be strict regulations INF4. Build awareness of the community ecosystem in general and strengthened by regulation.

Table 14 Trade Off sustainability in the e-commerce

Dimension	Element	Findings	Trade Off
Sustainability	Determining sustainability through the constructs: Environment, Economic and Social (Oláh et al., 2018; Pradhan et al., 2017; United Nations Member States, 2015).		
Economic Sustainability	*Growth*	1. The need for government protection against competition with imported goods. 2. Instability of production raw goods	1. Be selective about imported goods 2. Ensuring the stability of raw materials (example: chili for the chili sauce business)
	Tax	The timing of tax application and the category of tax application need to be evaluated	1. Taxation on mature sellers / resellers with a specified minimum turnover
	Purchasing Power	The purchasing power is relatively low, so it is price sensitive	1. Improve community welfare (UMR) 2. Incentives for sellers (SMEs) so that the selling price is not too expensive
Social Sustainability	*Employment*	High labour absorption but low productivity	1. Worker training
	Fraud	Fraud is proportional to traffic	1. Minimizing the possibility of fraud 2. System optimization
	Complaint	It needs to be selective in dealing with the complaint due to limited resources	1. Ranking the urgency of the complaint
Environment Sustainability	*Packaging*	Low public awareness of plastic waste	1. Regulation of the use of plastics 2. Provision of organic and non-organic waste bins 3. Provide pro-environment seller incentives
	Shipping	Aggregation of private vehicle emissions and e-commerce	1. Provide a choice of transportation modes 2. Collecting items to be purchased (in 1x transaction)

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