META-ANALYSIS OF E-COMMERCE ADOPTION BARRIERS FOR SMES

Tony Wijaya*
Andreas Mahendro Kuncoro**
Sutirman***

*P*URPOSE
THIS study aims to map the literature that discusses the factors that are antecedents of the barriers experienced by SMEs in adopting e-commerce. The research also aims to analyze the relationship between factors that have been mapped using meta-analysis.

Design/Methodology/Approach:*This research adheres to the quantitative literature review. The research to be carried out is a systematic study using research results published in a academic journal database. The data analysis technique in this study uses meta-analysis in assessing secondary data obtained from the research results through error correction of artifacts in quantitative research in the form of sampling errors.*

Findings: *The results show that theoretically, internal and external factors become barriers to e-commerce adoption. There is a relationship between internal and external factors with e-commerce adoption in SMEs.*

Research Limitations: *The data have limitations in traces taken from 2000-2020. Data is limited only on the barrier factors in e-commerce adoption.*

Managerial Implications: *This research will also useful on the mapping of factors that need to be considered in policy makers..*

Originality/Value: *There has not been a similar study conducted in the study area.*

Key Words*: Adoption, Barrier, E-commerce, Meta-analysis, SMEs.*

Introduction

Data from the Indonesian Central Statistics Agency shows that the amount of Gross Domestic Product created by SMEs during 2010 reached value. 1,013.5 Trillion (56.7 percent of GDP). The number of SME business units reaches 42.4 million, while the number of workers working in this sector is recorded at 79 million workers. The economic sector's business units that absorb the most workers come from small companies compared to large companies (Riyanti, 2003). This matter shows that small and medium enterprises can be developed in Indonesia because they can restore the national economy.

SMEs have a significant contribution to various countries. The Asian Productivity Organization (2011) states that SMEs' contribution in various countries with more than 75% of national products. Some of

  * *Associate Professor, Management Department, Universitas Negeri Yogyakarta, Yogyakarta.*
 ** *Lecturer, Management Department, Universitas Negeri Yogyakarta, Yogyakarta.*
*** *Associate Professor, Official Administration Department, Universitas Negeri Yogyakarta, Yogyakarta.*

the roles of SMEs in overcoming economic problems such as reducing unemployment and poverty rates can contribute to the Gross Domestic Product (GDP) aspect, which has implications for economic growth. SMEs also contribute to increasing exports and can expand investment (Heatubun, 2006). The real contribution of SMEs is shown by the increase in the number of workers in line with SMEs' growth. SMEs account for 51% of gross domestic product (GDP) (Zimmerer & Scarborough, 2005). The economic system based on SMEs has also encouraged new entrepreneurship-based businesses (Wijaya, 2008). SMEs is also considered an alternative to alleviate poverty and create jobs (Chiware & Dick, 2007). SMEs have a strong resilience when the country experiences an economic crisis (Niode, 2009) because they are on a scale that is independent of others. The SMEs sector has excellent potential to increase productivity, competitiveness, and national economic growth. The SME sector needs information to grow (Chiware & Dick, 2007).

Several studies have identified the importance of technology for support SMEs (Barry & Milner, 2002; Ifinedo, 2011; Mutula & Brakel, 2013). Aspects of technology knowledge and business information are also part of what is needed by SMEs to maintain their existence (Niode, 2009). SMEs' ability to adapt to information technology will determine their competitive ability (Mutula & Brakel, 2013). Dasanayaka et al., (2011) and Trianni & Cagno (2012) state the importance of the accessibility of information needed to develop a business. Lack of information about market opportunities and technological change is seen as being for SMEs (Kamalian et al., 2011). Several studies have succeeded in exploring the constraints faced by SME owners related to information technology. Musaroh and Wijaya (2015) found many complex and varied problems faced by SMEs in operating. Human resources are an obstacle in the adoption of information technology related to these findings. Nurhadi et al. (2016) also identified the limited use of information technology in SMEs. The lack of access to information, especially market information, is a weakness of SMEs. (Ishak, 2005). Information becomes an obstacle in marketing products which results in low market orientation and weak competitiveness.

The research findings with regard to the antecedents that affect the progress of e-commerce in SMEs present difficulties. Research results related to the adoption of information technology in SMEs have not provided complete results (Naranjo-Gil, 2009) because they are still partial. Research results vary widely from individual aspects (Lawrence, 1997; Quayle, 2002; Chau & Turner, 2002), organizational (Kabanda & Brown, 2015) to external factors outside the organization (Al-Hyari, et al., 2011) which cause difficulties in determining the factors that most play a role in related barriers to e-commerce adoption. Rehman & Alam (2016) try to categorize the factors that become barriers in adopting e-commerce, namely, organizational, financial, technical, regulatory, and behavioral barriers. However, the results of this study are only limited to the scope of Malaysian SMEs. The characteristics of samples from various countries and the number of samples used are also research artifacts, causing difficulties in concluding the factors that widely hinder the adoption of e-commerce in SMEs. There is no such study that comprehensively examines the barriers to the adoption of e-commerce in SMEs.

Objectives of the Study
The varied results were due to the presence of artifacts in the study, such as SMEs' characteristics, number of samples, geographical aspects, and measurement aspects. Artifacts are research imperfections such as sampling errors and variable measurement errors that often occur in primary research (Hunter & Schmidt, 1990). The research conducted aims to correct errors caused by artifacts in the study. The results of this study are expected to identify antecedent factors that hinder the widespread adoption of e-commerce in SMEs with a large sample combination from the results of previous studies. This study's general objective is to develop a practical design for measuring SMEs' adaptive selling behavior and their factors The purpose of the research is to analyse the theoretical model of the study of antecedent factors that impede the adoption of e-commerce in small and medium enterprises and examine the antecedent factors that impede the adoption of e-commerce in small and medium enterprises in terms of errors.

Literature Review

In general, various problems arise and are faced by SME actors, including limited market access, access to information on raw materials, access to capital, and access to the training needs to improve SME sources skills (Musaroh & Wijaya, 2015). The role of information technology as a basis in the SME trading system has attracted researchers' attention in various countries. Several studies discuss the barriers experienced by SME players in adopting e-commerce in a variety of ways.

Implementation costs (Riquelme, 2002), involvement (Quayle, 2002), low hardware technology (Lawrence, 1997), time (Walczuch et al, 2000), lack of information (Lawrence, 1997), awareness of benefits (Quayle, 2002), lack of technical skills (Quayle, 2002; Chau & Turner, 2002) hinder SMEs in IT adoption. Based on studies by Rehman & Alam (2016), Abualrob & Kang (2015), Love et al., (2001), Zaied (2012), Ndyali (2012), the factors that inhibit e-commerce adoption are categorised as external and internal barriers (2013).

Organizational responses to the application of the e-commerce system are classified as organizational barriers (Flynn & Purchase, 2001). According to Zaied (2012), several difficulties such as work procedures, management support, resistance to change, internet, and problems related to web are organizational obstacles. The technology applied in the trading system involves high implementation costs (Heung, 2003; Love et al., 2001; Zaied, 2012), so that it becomes an obstacle to the adoption process for SMEs. The factors that include the costs required for investment, maintenance, and the risk of implementing an e-commerce system are constraints on the financial aspects (Love et al., 2001). Also, the lack of financial infrastructure (Zaied, 2012), inability to develop returns on investment (Flynn & Purchase, 2001), uncertainty in payment methods will influence business decisions to implement e-commerce. Ignorance of appropriate techniques in evaluating the investment potential of e-commerce is a factor considered by SME owners. Lack of understanding of the benefits of e-commerce (Goode, 2002; Poon, 2000) is part of rejecting the decision to invest in information technology.

Companies that can carry out evaluations related to investment accompanied by complete and systematic information will get financial and non-financial benefits from e-commerce (Love et al., 2001). One of the primary sources of technical barriers is the suitability of the type of technology or software that is incompatible with current business needs (Love et al., 2001). The mismatch between technology and business will cause losses and increase operating costs. Organizations need to have external consultants who are good at technology to ensure that the technology applied is in line with their business needs. This issue occurs during the e-commerce adoption stage. Educational and knowledge factors (Darch & Lucas, 2002; Duan et al., 2002) have caused a crisis of confidence in the use of IT (Bode and Burn, 2002). Internet security factors are also part of the barrier to e-commerce applications. Therefore, trust and security are the most important things to overcome (Arendt, 2008). Recent surveys conducted within Brazil indicate low e-commerce adoption that is connected to government regulations that include privacy and security issues, lack of business laws to control e-commerce, lack of legal safeguards for Internet transactions and concerns over tax created. (Tigre & Dedrick, 2004). Likewise, in China, a weak rule of law is a significant barrier to e-commerce (Efendioglu & Yip, 2004). According to Munir & Yasin (2009), there are several laws that Malaysia has implemented, such as the Electronic Commerce Act (ECA), Electronic Government Activities Act (EGAA), and the Digital Signature Act (DSA) to facilitate and eliminate barriers to e-commerce adoption in SMEs.

Behavioral barriers concentrate on reluctance to make changes in work habits, lack of awareness of perceived benefits, difficulties in use, and the degree of uncertainty that technology imparts in humans (Love et al., 2001). All of these factors cause barriers and resistance to business actors against change. Humans are naturally resistant to change and may need approaches to overcome fears of the unknown, especially technology-related. Arendt (2008) states that the owner's concern that his employees will go and look for work in other companies after mastering technology is one of the obstacles in investing in technology.

Tony Wijaya, Andreas Mahendro Kuncoro, and Sutirman

Research Methods

The research conducted is a systematic review that synthesizes the results of similar studies. The research will be carried out through a literature review and previous research results and produce a theoretical model related to the studied research topic. Meta-analysis aims to verify the relationship between variables so that the result is an association or correlation between variables accompanied by a range of variants between variables (Wijaya, 2013).

This study uses secondary data collected through documentation of similar studies that discuss the antecedents of barriers to e-commerce adoption for SMEs through primary studies. The research results used are the results of primary studies that have been published in an international journal database. The data used as research data meet the criteria quantitatively or are the result of empirical research. The research population used as a sample source results from internationally published research that discusses quantitative antecedents of barriers to e-commerce adoption for SMEs. The sampling technique used purposive sampling technique and selected some research results that discuss quantitative antecedents of barriers to e-commerce adoption for SMEs. Articles were collected through a google scholar search in the 2000-August 2020 period, had a clear description of the number of samples (N), and presented data on one of the correlation values (r), t or F, the mean score and standard deviation. The data taken are internationally indexed articles such as Ebsco, Index Copernicus, and Scopus. The data analysis using meta-analysis. This method aims to examine the consistency of research results due to variations and verification of research, which increase the variety of research results. Meta-analyzes in research focused on sampling errors and variable measurement errors that often occur in primary studies.

Analysis and Interpretation

Theoretical Model

Based on the collection of literature studies from google scholar with a limit of 2000-2020, 69 international journal articles discussed the antecedents of barriers to e-commerce adoption in SMEs. The articles were then selected based on the criteria for quantitative research articles and obtained 19 articles. Articles that meet specific criteria that have complete data regarding the number of samples and have a correlation value (r) between variable relationships are eight articles that meet the analysis criteria.

The articles used for analysis then identified the antecedent variables of e-commerce adoption. The identification results are then discussed and discussed in a research group involving academic researchers in the field of SMEs. The identification results are grouped based on research results from Rehman & Alam (2016), Abualrob & Kang (2015), Love et al., (2001), Zaied (2012), Ndyali (2013), which categorize the barriers to e-commerce adoption in the category of barriers external and internal.

Internal barriers that hinder the adoption of e-commerce in SMEs are factors that come from within the SME organization. The factor including the size and benefits of the organization, individuals or behavior from owners, financial aspects, aspects of IT personnel who can operate systems or support technology systems, operational processes, types of products, types of business requiring technology, technical knowledge related to use and benefits, difficult implementation, time and value that are perceived based on considerations of benefits and costs. External barriers that hinder the adoption of e-commerce in SMEs come from outside the SMEs organization. The factor is including rules or regulations, supporting infrastructure or other technical aspects, socio-political factors, external support, technology, logistics, economic factors, security considerations, broad aspects of the environment, openness of business transparency of government, conglomeration, industrial activities similar to companies, competition, market considerations, country context and supporting resources from outside the organization. The results of grouping the antecedent factors of barriers to e-commerce adoption in SMEs are tabulated as table no. 1.

Table No. 1: Barriers to E-Commerce Adoption in MSMEs

No.	Factor	Variable	Reseacher
1	Intern	Organization	Mohamed Abou-Shouk and Mohammed I, Eraqi (2015)
		Behaviour	Mohamed Abou-Shouk and Mohammed I, Eraqi (2015)
		Finance	Kannabiran & Dharmalingam (2012)
		IT sources	Kannabiran & Dharmalingam (2012)
		Operation	Kannabiran & Dharmalingam (2012)
		Finance	Awa et al., (2015)
		Size of company	Awa et al., (2015)
		Product and service	MacGregor & Vrazalic (2008)
		Type of business	MacGregor & Vrazalic (2008)
		Benefit	MacGregor & Vrazalic (2008)
		Technical Knowledge	MacGregor & Vrazalic (2008)
		Implementation	MacGregor & Vrazalic (2008)
		Finance	MacGregor & Vrazalic (2008)
		Time	MacGregor & Vrazalic (2008)
		Individual Perception	Lim et al., (2018)
		Organization	Lim et al., (2018)
		Organization	Esmaeilpour et al., (2016)
		Value	Lama et al., (2018)
2	Extern	Regulation	Mohamed Abou-Shouk and Mohammed I, Eraqi (2015)
		Technical	Mohamed Abou-Shouk and Mohammed I, Eraqi (2015)
		Culture	Senarathna et al., (2014)
		Infrastructure	Kannabiran & Dharmalingam (2012)
		Information security	Kannabiran & Dharmalingam (2012)
		Technical	Esmaeilpour et al., (2016)
		Environment	Esmaeilpour et al., (2016)
		Infrastructure	Awa et al., (2015)
		Integration and business openness	Awa et al., (2015)
		Information	Awa et al., (2015)
		Government transparency	Awa et al., (2015)
		ICT Expert Conglomeration	Awa et al., (2015)
		Similarity to industrial activity	Awa et al., (2015)
		Safety	MacGregor & Vrazalic (2008)
		Competition	Lim et al., (2018)
		Infrastructure	Lama et al., (2018)
		Market	Lama et al., (2018)
		IT support	Lama et al., (2018)
		Social culture	Lama et al., (2018)
		Country context	Lama et al., (2018)
		Sources	Lama et al., (2018)
		Safety	Lama et al., (2018)

Meta-Analysis

Meta-analysis techniques were used to find each factor's correlation value based on the consideration of the existing sample from each study. According to the technical model developed in the previous study, the meta-analysis study was grouped into two groups, namely internal and external factors. The tabulation results for each of the adoption barrier factors are as follows:

Table No. 2: Internal Factor Variable Correlation

Number	Variable	Number of Samples	Correlation Coefficient
1	Organization	411	0,140
2	Behaviour	411	0,190
3	Finance	118	0,443
4	IT sources	118	0,312
5	Operation	118	0,408
6	Finance	191	0,458
7	Size of company	191	0,432
8	Product/service	247	0,245
9	Type of business	247	0,200
10	Benefit	247	0,258
11	Technical knowledge	247	0,192
12	Implementation	247	0,259
13	Finance	247	0,277
14	Time	247	0,239
15	Individual perception	217	0,160
16	Organization	217	0,420
17	Organization	157	0,412
18	Value	198	0,889

Table No. 3: Estimated Correction of Internal Factor Variable Sampling Error

Variable	N	ri	Nri	r	ri-r	(ri-r)²	N(ri-r)²
Organization	411	0,140	57,54	0,295	-0,155	0,024025	9,874275
Behaviour	411	0,190	78,09	0,295	-0,105	0,011025	4,531275
Finance	118	0,443	52,274	0,295	0,148	0,021904	2,584672
IT sources	118	0,312	36,816	0,295	0,017	0,000289	0,034102
Operation	118	0,408	48,144	0,295	0,113	0,012769	1,506742
Finance	191	0,458	87,478	0,295	0,163	0,026569	5,074679
Size of company	191	0,432	82,512	0,295	0,137	0,018769	3,584879
Product/service	247	0,245	60,515	0,295	-0,05	0,0025	0,6175
Type of business	247	0,200	49,4	0,295	-0,095	0,009025	2,229175
Benefit	247	0,258	63,726	0,295	-0,037	0,001369	0,338143
Technical knowledge	247	0,192	47,424	0,295	-0,103	0,010609	2,620423
Implementation	247	0,259	63,973	0,295	-0,036	0,001296	0,320112
Finance	247	0,277	68,419	0,295	-0,018	0,000324	0,080028

Variable	N	ri	Nri	r	ri-r	(ri-r)²	N(ri-r)²
Time	247	0,239	59,033	0,295	-0,056	0,003136	0,774592
Individual perception	217	0,160	34,72	0,295	-0,135	0,018225	3,954825
Organization	217	0,420	91,14	0,295	0,125	0,015625	3,390625
Organization	157	0,412	64.684	0.295	0.012	0.000144	0.022608
Value	198	0,889	176,022	0,295	0,594	0,352836	69,861528
Ó	4076		1221,91				113.526748

Based on the data in table no. 3, it is known that the r value of the internal resistance factor group is 0.299 (Nri/N) with a standard deviation of 0.1667 based on ("113.526748/4076) so that it can be seen:

Lower limit value = 0.299 - (1.96 x 0.1667) = 0.027

The upper limit value = 0.299 + (1.96 x 0.1667) = 0.626

The variation in the value of the relationship between internal factors and barriers to e-commerce adoption is 0.299 with a value ranging from 0.027 to 0.626 at the 95% confidence level.

Table No. 4: External Factor Variable Correlation

Number	Variable	Number of Samples	Correlation Coefficient
1	Regulation	411	0,150
2	Technical	411	0,270
3	Culture	81	0,702
4	Infrastructure	118	0,176
5	Information safety	118	0,005
6	Technical	157	0,201
7	Environment	157	0,264
8	Infrastructure	191	0,423
9	Integration and business openness	191	0,423
10	Information	191	0,412
11	Government transparency	191	0,482
12	ICT Expert Conglomeration	191	0,463
13	Similarity to industrial activity	191	0,468
14	Safety	247	0,200
15	Competition	217	0,350
16	Infrastructure	198	0,489
17	Market	198	0,651
18	IT support	198	0,411
19	Social culture	198	0,029
20	Country context	198	0,436
21	Sources	198	0,997
22	Safety	198	0,102

Table No. 5: Estimated Correction of External Factor Variable Sampling Errorr

Variable	N	ri	Nri	r	ri-r	(ri-r)²	N(ri-r)²
Regulation	411	0,150	61,65	0,4	-0,25	0,0625	25,6875
Technical	411	0,270	110,97	0,4	-0,13	0,0169	6,9459
Culture	81	0,702	56,862	0,4	0,302	0,091204	7,387524
Infrastructure	118	0,176	20,768	0,4	-0,224	0,050176	5,920768
Information safety	118	0,005	0,59	0,4	-0,395	0,156025	18,41095
Technical	157	0,201	31,557	0,4	-0,199	0,039601	6,217357
Environment	157	0,264	41,448	0,4	-0,136	0,018496	2,903872
Infrastructure	191	0,423	80,793	0,4	0,023	0,000529	0,101039
Integration and business openness	191	0,423	80,793	0,4	0,023	0,000529	0,101039
Information	191	0,412	78,692	0,4	0,012	0,000144	0,027504
Government transparency	191	0,482	92,062	0,4	0,082	0,006724	1,284284
ICT Expert Conglomeration	191	0,463	88,433	0,4	0,063	0,003969	0,758079
Similarity to industrial activity	191	0,468	89,388	0,4	0,068	0,004624	0,883184
Safety	247	0,200	49,4	0,4	-0,2	0,04	9,88
Competition	217	0,350	75,95	0,4	-0,05	0,0025	0,5425
Infrastructure	198	0,489	96,822	0,4	0,089	0,007921	1,568358
Market	198	0,651	128,898	0,4	0,251	0,063001	12,474198
IT support	198	0,411	81,378	0,4	0,011	0,000121	0,023958
Social culture	198	0,029	5,742	0,4	-0,371	0,137641	27,252918
Σ	4449		1576,126				216,779714

Based on the data in table 5, it is known that the correlation value (r) of the external resistance group is 0,3542 (Nri/N) with a standard deviation of 0.2207 (("216,779 / 4449)) so that it can be seen:

The lower bound value = 0.354 - (1.96 x 0.2207) = 0.0786

The upper limit value = 0.354 + (1.96 x 0.2207) = 0.7866

The variation in the value of the relationship between external factors and barriers to e-commerce adoption is 0.3542 with a value ranging from 0.0786 to 0.7866 at the 95% confidence level.

Based on a comprehensive meta-analysis study, it can be seen that there is a significant relationship between internal and external factors and barriers to e-commerce adoption in SMEs. Based on the study conducted, it can also be concluded that internal factors' role is 0.0894 or 8.94% in explaining the barriers to e-commerce adoption in SMEs. The contribution of external factors is 0.1254 12.54% in explaining barriers to e-commerce adoption in SMEs. Based on these two factors, it can be seen that external factors are more dominant than internal factors.

Internally, the organizational barrier factor is how the organization responds to the e-commerce system's application (Flynn & Purchase, 2001). Several organizational aspects are inhibiting factors

such as the absence of planning, and lack of organizational resources, including employee knowledge (MacGregor & Vrazalic, 2008), and the lack of need for e-commerce based on individual perceptions (Lim et al, 2018). Services the company offers and the goods it makes are reasons not to embrace e-commerce because they are incompatible with the e-commerce framework (MacGregor & Vrazalic, 2008). Barriers to indirect costs or financial restrictions, inability to quantify e-commerce benefits on the basis of benefits and costs, investment evaluation techniques, lack of strategic planning, unwillingness to develop alliances and general reluctance to change the way e-commerce is implemented by a company that has been run into a SME (Love et al., 2001). High development costs are involved in the technologies used in the trading system (Heung, 2003; Love et al., 2001; Zaied, 2012). Zaied (2012) notes that the variables of complexity in modifying current work processes, lack of support for management, organisational resistance to change, restricted use of the internet often discourage the adoption of e-commerce by an organisation. Financial barriers are costs needed for the introduction of an e-commerce system for investment, maintenance, and risk (Love et al., 2001), including the perceived value of the adoption of e-commerce (Lama et al., 2018).

Barriers from individual or owner behavior also hinder the adoption of e-commerce, such as reluctance to make changes in work habits, lack of awareness of perceived benefits, difficulty in use, and the level of uncertainty that technology implants in humans (Love et al., 2001). These aspects cause barriers and individual resistance to change. Arendt (2008) emphasizes that business people's reluctance to invest in e-commerce training for employees is due to owner concerns about the uncertainty of conditions and commitment of employees to stay in the organization.

While the lack of external inappropriate or inadequate regulation of e-commerce is a constraining factor, the technical aspects of the network and the technical aspects of e-commerce are considered constraining factors (Shouk & Eraqi, 2015) (Shouk & Eraqi, 2015). This external factor is consistent with the findings of a recent survey conducted among Brazilian consumers showing the low adoption of e-commerce related to government regulations such as concerns about privacy and security, lack of business laws for regulating e-commerce, lack of legal protections for internet purchases, and concerns over taxes, which resulted (Tigre & Dedrick, 2004) (Tigre & Dedrick, 2004). The same is true in China where consumers do not trust the rule of law and see it as an obstruction to online transactions (Efendioglu & Yip, 2004). A study conducted by Munir and Yasin (2009) found that Malaysia has enacted laws to facilitate e-commerce adoption.

The inability to control e-commerce is a restricting factor, but the technological aspects of the network and the technical aspects of e-commerce are also constraining factors (Shouk & Eraqi, 2015). This external factor is consistent with the results of a recent survey conducted among Brazilian customers showing low adoption of government-related e-commerce regulations, such as privacy and security concerns, lack of e-commerce regulatory business rules, lack of legal safeguards for internet transactions, and tax concerns, which resulted in (Tigre & Dedrick, 2004). Similarly, customers in China do not trust the rule of law and see it as an obstacle to e-commerce (Efendioglu & Yip, 2004). Malaysia has enacted laws to promote e-commerce adoption, according to Munir and Yasin (2009).

Conclusion and Recommendations

Based on the literature study and meta-analysis, it can be concluded; theoretically, the factors that influence the adoption of e-commerce in SMEs are grouped into two main factors, namely internal and external. Internal barriers that hinder the adoption of e-commerce in SMEs are factors that come from within the SME organization, including the size and benefits of the organization, originating from individuals or behavior from owners, financial aspects, aspects of IT personnel who can operate systems or support technology systems, operational processes, types of products or services, types of business requiring technology, technical knowledge related to using and benefits, difficult implementation, time

and value that are perceived based on considerations of benefits and costs. External barriers that hinder the adoption of e-commerce in SMEs are factors that come from outside the SMEs organization, including rules or regulations, supporting infrastructure or other technical aspects, socio-political factors, external support or technology, logistics, economic factors, security considerations, broad aspects of the environment, related to integration or openness of business or transparency of government, aspects of conglomeration, related industrial activities similar to companies, competition, market considerations, country context and supporting resources from outside the organization.

A meta-analysis study with the consideration of sampling error correction shows a significant relationship between internal and external factors with barriers to e-commerce adoption in SMEs. Based on the study conducted, it can also be concluded that internal factors' role is 0.0894 or 8.94% in explaining the barriers to e-commerce adoption in SMEs. The contribution of external factors is 0.1254 12.54% in explaining barriers to e-commerce adoption in SMEs. Based on these two factors, it can be concluded that external factors are more dominant than internal factors.

Based on the literature review findings, theoretically, factors that can be taken into account in assessing barriers to e-commerce adoption are internal and external factors. This theoretical model can be studied in an empirical model for future researchers. Practically, SME players can consider internal barrier factors that hinder the adoption of e-commerce in SMEs by minimizing these factors' effects. External parties such as the government or local stakeholders need to consider external barrier factors that hinder the adoption of e-commerce in SMEs through efforts to minimize external factors such as reviewing regulations that support e-commerce implementation, preparing infrastructure, and ensuring network security systems.

References

Al-Hyari, K., Al-Nasour, M., Al-Weshah, G., & Abutayeh, B. (2011). Exporting performance and manufacturing activities in Jordanian SMEs: External barriers and relationships, *International Journal of Global Business*, *4*(1), 44-72.

Archer, N., Wang, S. and Kang, C. (2008). Barriers to the adoption of online supply chain solutions in small and medium enterprises", *Supply Chain Management*, *13*(1), 73-82.

Arendt, L. (2008). Barriers to ICT adoption in SMEs: How to bridge the digital divide, *Journal of Systems and Information Technology, 10*(2), 93-108.

Asian Productivity Organization (2006). *APO Productivity data book*, Asian Productivuty Organization, Japan: Keio University Press Inc.

Awa, H.O., Awara, N. F. & Lebari, E. D. (2015). Critical factors inhibiting electronic commerce (EC) adoption in Nigeria: A study of operators of SMEs, *Journal of Science and Technology Policy Management*, *6*(2), 143-164.

Barry. H., & Milner, B. (2002). SMEs and electronic commerce: A departure from the traditional prioritisation of training?, *Journal of European Industrial Training, 26*(7), 316-326

Bode, S., & Burn, J. M. (2002). Strategies for consultancy engagement for e-business development – A case analysis of Australian SMEs, *Managing Information Technology in small business: Challenges and solutions* (pp.227-245), Melbourne: Idea Group.

Chau, S. B., & Turner, P. (2001). A four phase model of EC business transformation amongs small to medium sized entreprises. Proceedings of the 12th Australian Confrence on Information Systems, Australia.

Chiware, E.R.T., & Dick., A. L. (2007). The use of ICTs in Namibia's SME sector to access business information services, *The Electronic Library*, *26*(2), 145-157.

Darch, H., & Lucas, T. (2002). Training as an e-commerce enabler, *Journal of Workplace Learning, 14*(4), 148-156.

Dasanayaka, S., Kankanamge, R., & Sardana, G. (2011). Identification of barriers for development of the Sri Lanka small and medium scale furniture and wooden products manufacturing enterprises, *Euro Asia Journal of Management*, *21*(40), 69-101.

Duan, Y., Mullins, R., Hamblin, D., & Stanek, S. (2002). Addressing ICTs skill challenges in SMEs: Insights from three country investigations, *Journal of European Industrial Training, 26*(29), 430-445.

Efendioglu, A. M., & Yip, V. F. (2004). Chinese culture and e-commerce: An exploratory study, *Interacting with Computers, 16*(1), 45-62.

Flynn, A., & Purchase, S. (2001). Perceptions of barriers to e-commerce. *Proceedings of The Australian and New Zealand Marketing Academy Conference,* 1-6.

Goode, S. (2002). Management attitudes toward the world wide web in Australian small business, *Information Systems Management, 19*(1), 45-48.

Heatubun, A. B. (2006). Potential Number of Small and Medium Enterprises in Their Role to Stimulate the Economy, *Journal of Organization and Management, 4,* 34-45.

Heung, V. C. S. (2003). Barriers to implementing e-commerce in the travel industry: A practical perspective, *Journal of Hospitality Management, 22*(1), 111-118.

Hunter, J.E., & Schmidt, F.L., (1990). *Methods of meta-analysis, Correcting Error and Bias in Research Findings*, Sage Publications, Newbury Park.

Ifinedo, P. (2011). Internet/e-business technologies acceptance in Canada's SMEs, *Internet Research, 21*(3), 225-281.

Ishak, E. (2005). The role of information for the advancement of SMEs*, Kedaulatan Rakyat*, Yogyakarta.

Kabanda, S. K., & Brown, I. (2015). E-Commerce enablers and barriers in Tanzanian small and medium enterprises, *EJISDC*, *67*(7).

Kamalian, A., Rashki, M., & Arbabi, M. (2011). Barriers to innovation among Iranian SMEs, *Asian Journal of Business Management*, *3*(2),79-90.

Kannabiran, G., & Dharmalingam, P. (2012). Enablers and inhibitors of advanced information technologies adoption by SMEs, Journal of Enterprise Information Management, *25*(2), 186-209.

Lama, S., Pradhan, S., Shrestha, A., Beirman., D. (2018). Barriers of e-tourism adoption in developing countries: A case study of Nepal Australasian conference on information systems Lama, Pradhan, Shrestha & Beirman, Sydney, Australia.

Lawrence, K, L. (1997). Factor inhibiting the utilization of electronic commerce facilities in Tasmanian small-to medium sized enterprises, Proceedings of the 8ᵗʰ Australian Confrence on Information Systems, 587-597.

Lima, S. C., Limb, S. P., & Trakulmaykeec, N. (2018). An empirical study on factors affecting e-commerce adoption among SMEs in west Malaysia, Management Science Letters 8 (2018) 381-392.

Levy, M., & Powell, P. (1998). SME Flexibility and the role of information systems. *Small Business Economics, 11,* 183-196.

Love, P. E. D., Irani, Z., Li, H., Cheng, E. W. L., & Tse, R. Y. C. (2001). An empirical analysis of the barriers to implementing e-commerce in small-medium sized construction contractors in The State of Victoria, Australia, *Journal of Construction Innovation, 1*(1), 31-41.

Matejun, M. (2014). The role of flexibility in building the competitiveness of small and medium enterprises, *Management*, *18*(1).

MacGregor, R., & Vrazalic, L. (2008) A profile of Australian regional SME non-adopters of E-commerce, small enterprise research, *16*(1), 27-46.

Munir, A. B. & Yasin, S. H. M. (2009). *Electronic commerce legal framework: Some lessons from Malaysia*, Retrieved from *http://slconf.uaeu.ac.ae/papers/PDF%201%20English/e3.pdf,* Accessed on November 15, 2013.

Musaroh & Wijaya, Tony (2015). An exploratory study of the profile of the Micro, Small and Medium Enterprises Classification of Crafts in DIY. Research project LPPM UNY. Yogyakarta. Funded by DIPA BLU UNY Fund for the 2015 fiscal year.

Mutula, K. S., & Brakel, P. V. (2013). E-readiness of SMEs in the ICT sector in Botswana with respect to information access, *The Electronic Library*, *24*(3), 402-417.

Naranjo-Gil, D. (2009). The Influence of environmental and organizational factors on innovation adoptions: Consequences for Performance in Public Sector Organizations. *Technovation*, *29*(12), 810-818.

Niode, I. Y. (2009). The MSME sector in Indonesia: Profile, problems, and empowerment strategies. *Journal of Economic Studies OIKOS-NOMOS*, *2*(1), January.

Poon, S. (2000). Business environment and internet commerce benefit – A small business perspective, *European Journal of Information Systems, 9*(2), 72-81.

Quayle, M. (2002). E-commerce: The challenge for UK SMEs in the twenty-first century, *International Journal of Operations and Prduction Management, 22*(10).

Rehman, S. U., & Alam, R. (2016). A study of barriers to e-commerce adoption among SMEs in Malaysia, *University of Modern Sciences, 1*(1), 45-58

Riquelme, H. (2002). Commercial internet adoption in China: Comparing the experience of small, medium, and large business, Internet Research: Electronic Networking Applications and Policy, *12*(3).

Senarathna, I., Warren, M., Yeoh, W., Salzman, S. (2014). The influence of organization culture on E-commerce adoption, *Industrial Management & Data Systems, 114*(7), 1007-1021.

Shouk, M. A., & Eraqi, M. I. (2015). Perceived barriers to e-commerce adoption in SMEs in developing countries: The case of travel agents in Egypt, *International Journal of Services and Operations Management, 21*(3), 332-353.

Tigre, P. B., & Dedrick, J. L. (2004). E-commerce in Brazil: Local adaptation of a global technology, *Electronic Markets, 14*(1), 36-47.

Trianni, A., & Cagno, E. (2012). Dealing with barriers to energy efficiency and SMEs: Some empirical evidences, *Energy, 37*(1), 494-504.

Walczuch, R., Van Braven, G. & Lundgren, H. (2000). Internet adoption barriers for small Firms in The Netherlands, *European Management Journal, 18*(5).

Wijaya, Tony. (2008). Studies of empirical models of entrepreneural behavior in DIY and Central Jawa JKM, *Management Journal of Entrepneurship, 10(2)*, 93-104.

Wijaya, Tony (2013). *Business and economic research methods*, Graha Ilmu: Yogyakarta.

Zimmerer, T. F., & Scarborough, N. M. (2005). *Essentials of entrepreneurship and small business management,* New Jersey: Prentice-Hall.