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FOCUS ON RESEARCH IN CONTEMPORARY ECONOMICS

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To cite this article: Justino, M., Tengeh, R., & Twum-Danko, M. (2021). A conceptual framework for the adoption of m-commerce by brick-and-mortar retailers. *Focus on Research in Contemporary Economics (FORCE), 2*(2), 93-115.

To link to this article: https://www.forcejournal.org/index.php/force/article/view/35

Published online: 25 December 2021.

Submission date: 24.06.2021 | Acceptance date: 06.12.2021 RESEARCH ARTICLE

A CONCEPTUAL FRAMEWORK FOR THE ADOPTION OF M-COMMERCE BY BRICK-AND-MORTAR RETAILERS

Mateus Justino, Robertson Tengeh*, & Michael Twum-Darko

ABSTRACT

Regardless of the internal pressures, brick-and-mortar retailers are being compelled by external forces to adopt a mobile commerce (m-commerce) strategy in order to meet emerging consumer experiences in recent years. Although previous research has identified some of the factors that influence the adoption of m-commerce, there is scope for further investigation in light of the changing dynamics of the external forces. Aim: to propose a conceptual framework for adopting m-commerce by brick-and-mortar retailers. Methods: A scoping literature review was done to identify the most critical models/frameworks and factors that influence the adoption of m-commerce by brick-and-mortar retailers. Results: The paper presents a theoretical paradigm that enables a tentative understanding of the vital antecedents of m-commerce adoption by retail brick-and-mortar businesses. Apart from finding holes for future studies, the article suggests a feasible approach.

KEY WORDS: *M-commerce, Brick-and-mortar retailer, Mobile shopping, Retail, Technology Organisation-Environment (TOE) framework, Task-technology Fit (TTF) model.*

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1. INTRODUCTION

Mobile commerce is a channel that enables businesses to sell and customer to buy product or service wirelessly, through mobile devices (Liang & Wei, 2004:7; Frolick & Chen, 2004:53; Yang, 2005:257; Liang *et al*, 2007:1155; Berglund & Sandström, 2013:276). Several traditional business products and services are seen fit to be transacted via mobile technology. By incorporating mobile commerce into conventional sales channels, previous research indicates that m-

commerce can allow brick-and-mortar retailers to increase sales, resulting in positive channel synergy (EY, 2015:6; Huang, Lu & Ba, 2016:265). Mobile commerce positively influences and strengthens customer loyalty, and customer loyalty significantly affects customers satisfactions (EY, 2015:6; Kalaivani, 2020:5947). Former research also supports that new channels may enable retailers to yield other benefits, such as expanded consumers' base and increased competitive differentiation (EY, 2015:6). Mobile commerce rationalises and speeds up trade and transforms it into digitalised mobile systems.

In general, electronic commerce (e-commerce) outlets have wrought innovative shifts in the retail market (Pantano & Timmermans, 2014:101; EY, 2015:4; Helm, Kim & Van Riper, 2018; Hübner, Holzapfel & Kuhn, 2016:287; Prasanna et al., 2019:1). Thus, consumers have learned and experienced new value-added features such as timeless shopping, the surroundings (i.e., the comfort of consumer buying at the place of their convenience), and affordable personalised and electronic transaction delivery services (Lamb et al., 2008:95; Picoto, Bélanger & Palma-dos-Reis, 2014:573; Njenga, Litondo & Omwansa, 2016:13; Goddard, 2020:4). In fact, consumers now frequently demand incremental changes in brick-and-mortar retailers traditional sales channel to accommodate their new experience (Verhoef, Kannan & Inman, 2015:174; Caro, Kök & Martínez-de-Albéniz, 2020:51). Other trends influencing consumer buying behaviour in today's economies include technological advances in the field of telecommunications (e.g. Fifth Generation (5G) mobile communication system) that help promote the dissemination of information (Čater *et al*., 2018:192; Psyrris, Kargas & Varoutas, 2020; Taheribakhsh, Jafari, Peiro & Kazemifard, 2020), the rapid expansion of e-commerce outlets (Caro *et al*., 2020:52), the Coronavirus Disease (Covid-19) pandemic that has triggered a dramatic surge in customers' demand for contactless store pick-up and home delivery (Finotto *et al*., 2020:1; Gamser & Chenevix, 2020; Goddard *et al*., 2020:4). One of the most compelling drivers is that m-commerce can provide brick-and-mortar retailers with a more strategic approach to accede to customer's demands, provide consumers with a seamless shopping experience (EY, 2015:8), to exchange goods and gain market share (Swilley, Hofacker & Lamont, 2012:1; Verkijika, 2018:1665). It may enable a brick-and-mortar retailer to cultivate business image and relationship with customers, seize new business opportunity and generate economic value.

Due to the popularity of m-commerce, it is essential to pay particular attention to brick-and-mortar retailers' usage of mobile commerce (m-commerce). In recent years, it has become clear that brick-and-mortar retailers are either being pulled or pushed to adopt mobile commerce. Although the question of what drives the adoption of m-commerce has been addressed to some extent by previous research, there is scope for further investigation in light of the changing dynamics of the external forces and the context of brick-and-mortar retailers. This paper aims to define the critical factors that influence the adoption of m-commerce by brick-and-mortar retailers and propose a conceptual framework for its adoption.

1.1. Brick-and-mortar retailer

A brick-and-mortar retailer refers to a physical building, a visible structured unit within an economy, established to sell goods or services to the final consumer. It is also known as a shop, retail outlet, retail store (Guy, 1998:255; Lamb *et al*., 2008:282) or traditional retailer (Yamagata-Lynch, Cowan & Luetkehans, 2015). In general, brick-and-mortar retailers provide food products, general merchandise and/or services to the community and are located within residential areas or shopping malls and decentralised areas (Guy, 1998:255; Lamb *et al*., 2008:279-280). Furthermore, they often strive to provide quality product or service under well-structured and designed business operations. Retailing practices improve people's lives by making available the products or services they use daily and need to replace; they enable consumers to quickly purchase the things that embody their lifestyles and decide their quality of living; and they create job opportunities for individuals and the economy.

In essence, brick-and-mortar retailers' activities and interrelationship with their business partners within an economy or internationally are well-documented, but very little is known about the determinants of m-commerce adoption/use in their business context, which constitute a global phenomenon.

1.2. Mobile commerce

Mobile commerce is about making the transaction information to reach the customers and from the customer to the organisation wirelessly until the transaction process is completed. According to several previous studies, m-commerce refers to the transaction that are performed by using wireless telecommunications network (Yang, 2005:257); electronic business transactions

through mobile phone or tablet (Liang & Wei, 2004:7); and the sales of products and services to customers using wireless internet (Frolick & Chen, 2004:55).

2. METHODS

As the title and the aim indicate, this study sought to identify the essential models/frameworks and factors influencing brick-and-mortar businesses' adoption of m-commerce. The research objective was met by the use of a scoping literature review technique (Munn et al., 2018). The search was conducted using the databases such as Google Scholar, EbscoHost, IEEE Xplore and ScienceDirect from 1995 to 2020 using the syntax rules of the databases. Keywords and their combinations were used to identify peer-reviewed academic publications that met the eligibility criteria where all titles and abstracts were searched. The eligibility criteria were publications in English regarding "mobile commerce adoption/use" "m-commerce adoption/use" and related keywords were "organisation", "business", "firm", "company", "SMEs", "merchant", "retailer" "brick-and-mortar store", brick-and-mortar retailer". The study identified four hundred and seventy-one (471) full text articles related to m-commerce adoption or use and one or more related keywords. However, a distinct procedure was employed to select the articles that meet the inclusion criteria.

2.1. Selection criteria

The following criteria for inclusion and exclusion were defined:

For the inclusion criteria, selected article: (i) should contain the eligibility criteria and one or more of related keywords in its title or abstract or discussion or conclusion; (ii) the study's objective or aim or purpose should focus on m-commerce use/adoption at an organisational level; (iii) the outcome of the study should be a result of the empirical test; and (iv) the article that meets the above criteria should be in English. For the exclusion criteria, items were rejected if they did not match all of the preceding inclusion criteria (i.e., criteria i, ii, iii and iv). Figure 1 shows the selection flow diagram adopted.

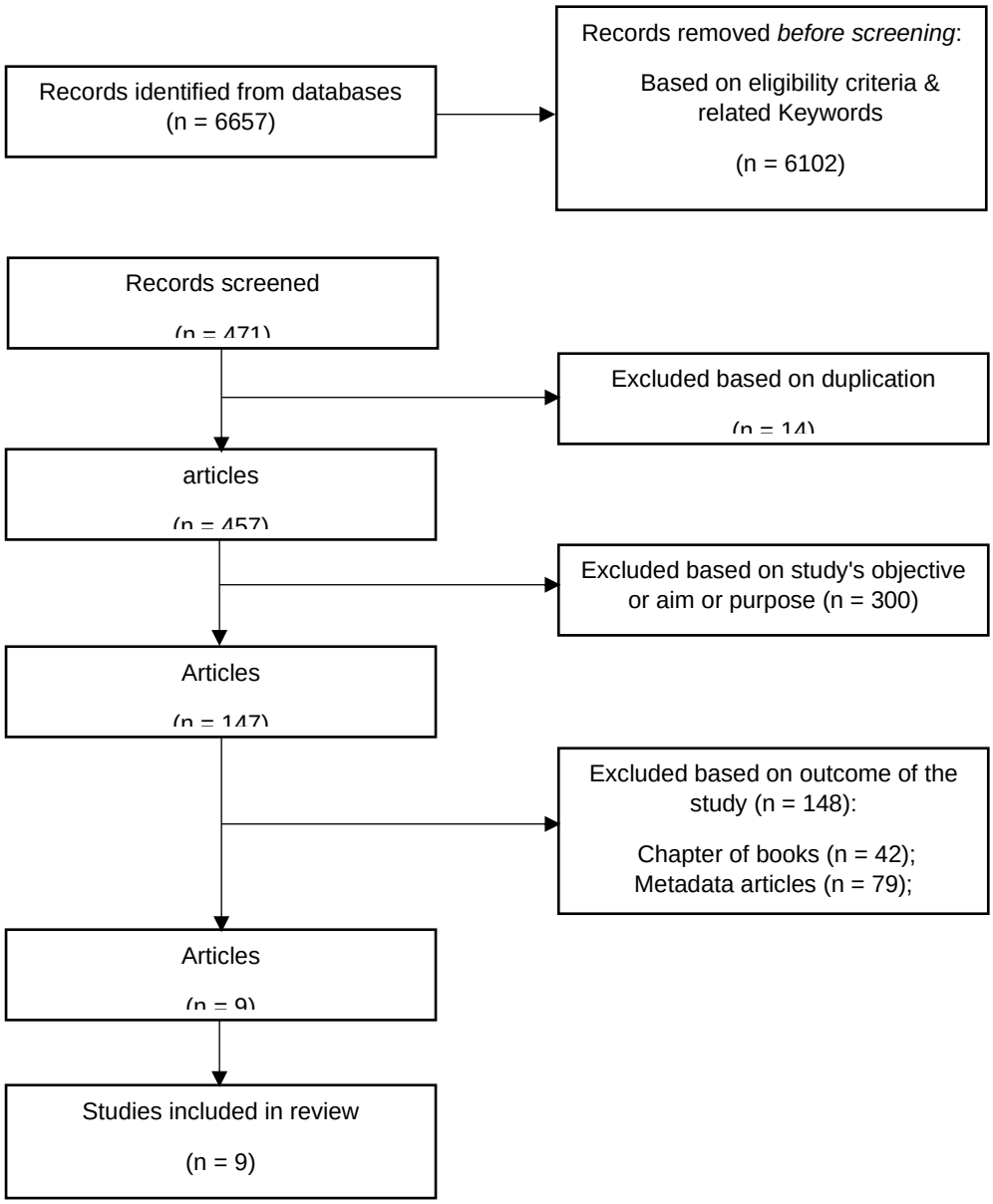

Figure 1: Selection of study flow diagram (Page *et al*. 2021)

2.2. Selection process

It was noted that an overwhelming majority of the 300 potential articles met the first, third and fourth predefined inclusion criteria but did not meet the second categorical criterion. Their study's objective or aim, or purpose were related to individual standpoint (57.7%), mobile business (m-business) (4.5%), and omnichannel strategy (1.5%). Other articles did not meet the second and third criteria (24.6%), or simply the third criterion (empirical test) (6.7%) and others were excluded as repeated articles (3%). Finally, the remaining articles were included as eligible for the scoping review (1.9%). Table 1 presents the summary of the articles selected as suitable for this study's review. According to Meline (2006:26), these eligible articles should be set as the sample of the scoping

literature review' studies and consequently analysed.

2.3. Information extraction

This study focused on gathering qualitative data related to the title and objective of the investigation. The papers that were determined to be suitable for this investigation were organized chronologically. Consequently, they were scrutinised and carefully extracted data separately. As a result, the data retrieved from the eligible publications were correlated to the research's aims, the theoretical frameworks/models discussed in the studies, the determinant factors of m-commerce adoption/usage that were proposed and tested, and the outcomes of the studies.

2.4. Analysis

The analysis started with a review of the key concepts for the coding of the data to be undertaken. This step included content analysis, which included reviewing and evaluating the retrieved data. Thus, it enabled the reviewers to perform a reliable coding and analysis, allowing them to detect the similarities and differences across the eligible studies and to ascertain their common underlying themes. Thus, the researchers concluded on the theory/theories and determining factors for the adoption of m-commerce by brick-and-mortar retailers based on the predominating themes.

3. RESULTS

The organisational adoption of m-commerce has been observed from different business perspectives. Some of earlier studies used the Technology-Organisation-Environment (TOE) theoretical framework to investigate the factors that have a bearing on Small and Medium Enterprises (SMEs) (Jain, Le, Lin & Cheng, 2011; 2014; Lu, Hu, Huang & Tzeng, 2015) and hotels adoption of m-commerce (Wang, Li, Li & Zhang, 2016). However, they used a single framework for the study. Although some of the influential factors of adoption identified in these studies overlap, many of these determinant factors vary considerably. Even so, other authors like Chau and Deng (2018) have to integrate the TOE framework with Innovation Diffusion Theory (IDT) to investigate the critical determinants and/or influential factors of m-commerce adoption, particularly in Vietnamese SMEs.

Furthermore, other researchers have integrated different theoretical models

such as the Task-Technology Fit (TTF) model and the Unified Theory of Acceptance and Use of Technology (UTAUT) to assess m-commerce adoption by firms (Prasarry, Astuti, & Suyadi, 2015). Factors that have a bearing or put pressure on organisations with respect to m-commerce adoption have also been investigated with the Institutional Theory (Swilley, Hofacker & Lamont, 2012; Li & Wang, 2018). The scrutiny of these study assisted in identifying the different models/frameworks and determinant factors that have been used from varied business categorical/industrial perspectives to investigate m-commerce adoption. Table 1 below shows a summary of eligible studies' objectives, adoption determinant factors and underpinned theory/theories discussed above.

Table 1: Determinant factors of m-commerce adoption at an organisational level

Study's objective	Determinant	Theoretical foundation	Author (s)
investigate the mobile commerce technology adoption and use in New Zealand SMEs.	technologies advantages, compatibility, vendors support, cost factor	IDT	Al-Qirim (2006)
Explore the factors affecting the adoption of m-commerce in Indian MSMEs.	Technological infrastructure, relative advantage, complexity, trialability; partner readiness, external support, firm size, financial resource, IS expertise.	TOE framework	Jain *et al*. (2011)
investigate the influences and pressures acting upon the firm with respect to mobile commerce adoption	electronic business capability, coercive pressures, normative pressure	Institutional Theory	Swilley, Hofacker and Lamont (2012)
Explore the environmental factors affecting m-commerce adoption by telecommunication firms.	competitive pressure, regulatory environment, social influence, support industries, customers pressure, government pressure.	IDT	Alrawabdeh (2014)
Evaluate the implementation of business-to-business m-commerce by SMEs.	data security, network reliability, technology complexity, top management emphasis, employees' IS knowledge, firm size, competitive pressure, partner support, regulatory support.	TOE framework	Lu *et al*. (2015)
Examine factors affecting the adoption of m-commerce by SMEs.	performance and effort expectancy, task characteristics, fit.	UTAUT and TTF model	Prasarry, Astuti, and Suyadi (2015)
Investigate the factors affecting hotel's adoption	Compatibility, complexity, critical mass, firm size, technology competence.	TOE framework	Wang et al. (2016)

of mobile reservation system.			
Investigate the critical determinants for m-commerce adoption by SMEs	Perceived: benefits, compatibility, security, costs; top management support, organisational readiness, managers and employees' IT knowledge, strategic orientation, competitive pressure, customer pressure, government support.	TOE framework and IDT	Chau and Deng (2018)
Explore institutional pressures on the adoption of m-commerce by firms and the mediation effect of top management.	Mimetic pressure, coercive pressure, normative pressure	Institutional Theory	Li & Wang (2018)

4. INTERPRETATION

Previously conducted studies revealed some variation in the parameters influencing the adoption of m-commerce at the company level. Even so, studies that used the same theoretical foundations, such as of Jain *et al*. (2011); Lu *et al*. (2015); and Wang et al. (2016), have shown some divergence between determinant factors. However, the divergence of determinant factors could result from the interventions made in different organisational contexts. In a separate vein, there are also parallels between the factors of m-commerce adoption identified by those research. Two or more studies found various intervention components, including top management support, company size, competitive pressure, coercive pressure, normative pressure, and compatibility. However, some variation in the meaning and interpretations of these factors could be detected. Moreover, it was also observed that these factors predict power may vary in deferent industries and contexts (Wang *et al*., 2016:170). Therefore, brick-and-mortar retailers should consider the variance in the factors that influence the integration of m-commerce into a business.

The accumulated findings of the eligible studies show that the TOE framework remains one of the theories that is widely used for investigating m-commerce adoption in an organisational context. Furthermore, the study identified that some of the eligible studies used a single framework or model for the investigation (Al-Qirim, 2006; Jain *et al*. 2011; Swilley *et al*., 2012; Alrawabdeh, 2014; Lu *et al*., 2015; Wang et al., 2016; Li & Wang, 2018), while others had to integrate frameworks or theories (Prasarry et al. 2015; Chau & Deng, 2018). One would be provided with a couple of reasons to incorporate different frameworks or variables to investigate the adoption or use of new technological

innovation. Researchers argue that potential models/frameworks are too fragmented for contextualising a business sector/industry (Wang et al., 2016:165) or that their proposed constructs and dimensions/measurements for explaining and evaluating the external variables (Gangwar, Date & Ramaswamy, 2015:111) and the technological innovation variables are not clearly defined (Shih and Chen, 2013:1009). As some of existing mobile commerce adoption models and frameworks propounded by prior research tend to cover limited determinant factors of adoption at a business level, Chau and Deng (2018:438) assert that integrations across existing theories or adding constructs from one theory into another would provide a more comprehensive explanation of how to adopt technological innovation in organisations. Similarly, it has been observed that the improvement of explanatory and predicting power are the inspiring motivation behind models and frameworks integration decision (Chau & Deng, 2018:438).

4.1. Underpinning theory

This study used the TTF model and the TOE framework to deal with the complexities surrounding the use of m-commerce by brick-and-mortar retailers.

The Task-Technology Fit (TTF) model is based on the guiding premise that the success impact of a specific technology results from the TTF, i.e., the correspondence between the technology properties and task requirements, and the use of the technology (Goodhue & Thompson, 1995:216; Dishaw & Strong, 1999; Gebauer *et al*., 2010; Abbas, Hassan, Iftikhar & Waris, 2018; Vongjaturapat, 2018). Five constructs constitute the TTF model, which are 1) task characteristics, 2) technology characteristic, 3) both shall predict task-technology fit, which in turn 4) predicts utilisation and 5) the two last constructs predict performance. Comparatively, the Technology-Organisation-Environment (TOE) framework explains the technology adoption in the context of a business. It casts light on how the components of the business environment hold substantial sway on the business technology adoption decision-making (Tornatzky & Fleischer, 1990; Lippert & Govindarajulu, 2006:149; Baker, 2011). The TOE segments the business environment into three fundamental components of technology adoption decision-making, which are the organisational context (i.e., considers the characteristic of the firm and its resources), the technological context (i.e., takes into consideration the potential technologies that are available in the market for the business and the existing technology at the business) and the environmental context (i.e. give attention to

the business's external environment, and stresses the elements in this setting that affect a business's technology adoption decision-making (Eze *et al*., 2019; Lippert & Govindarajulu, 2006:149; Matikiti, Mpinganjira & Roberts-Lombard, 2018; Eze et al., 2019; Wang *et al*., 2016:163).

Analysing the theoretical perspective of the proposed conceptual framework, the study assumes that integrating the TTF model with the TOE framework will serve as a lens through which to understand the adoption of m-commerce by brick-and-mortar retailers. Furthermore, they may serve as the theoretical support to explore the underlying factors that influence the adoption of the mobile channel because of the combined relationship of their constructs, i.e., the task characteristics, technology characteristics and TTF (from TTF model), the organisational context, the technological context and environmental context (from TOE theoretical model).

Therefore, this study assumes that these constructs may act as the lens to better explore the magnitude of this research problem for the following reasons. First, the task construct may be used to effectively examine the nature of tasks-related m-commerce performed by brick-and-mortar retailer. Second, the technology characteristics (i.e., for the TTF model) and the technology context (i.e., for the TOE framework) constructs can be adapted to explore the technological features of m-commerce that influence the adoption of the mobile channel by brick-and-mortar retailers. Third, the TTF construct is suggested to understand and assess whether m-commerce systems fits brick-and-mortar retailers' tasks and the underlying value-added features or synergetic power between them. Fourth, the organisation context may be adapted to determine the factors in the brick-and-mortar retailer internal environment that influence the adoption of m-commerce. And lastly, the environmental context construct is proposed to determine the elements within the business external environment that affect the brick-and-mortar retailer m-commerce adoption decision.

4.2. The technology context

The technology context is concerned with the characteristics and structure of the technology available for the business in its internal and external settings (Lippert & Govindarajulu, 2006:149; Baker, 2011; Martín *et al*., 2012:949; Wang *et al*., 2016:165; Eze *et al*. 2019:4). It reflects the necessary feature and characteristics of m-commerce systems a business will need. The following determinants within the technology context were identified as critical for adopting

m-commerce by brick-and-mortar retailers: data security, relative advantage, technology characteristics and task-technology fit.

4.2.1. Data security

Security is described as "the perception, or judgment, and fear of safeguarding mechanisms for the movement and storage of information through electronic databases and transmission media" (Lippert & Govindarajulu, 2006:147). Therefore, data security reflects the extent to which the data/information stored up and the transactions across the internet are protected against crimes and threats. However, it ascertained that without tighter data security, the organisation and customer data/information tend to become vulnerable to disclosure, destruction and unlawful access. Therefore, this study proposes data security as a critical determinant of the adoption of m-commerce in that brick-and-mortar retailers can experience increased cybercrime if they start trading over the internet without tighter data security (Wamuyu & Maharaj, 2011:55; Gangwar *et al*., 2015:122). Therefore, it is expected that m-commerce data security should deal with the critical issues of the organisation and customer information privacy and security.

4.2.2. Relative advantage

Relative advantage reflects the extent to which a technology is perceived to offer an intrinsic business value over the alternative or existing technology (Jain *et al*., 2011:162). It has been reported that businesses evaluate the costs and benefits as critical determinants of technological innovation adoption (Picoto *et al*., 2014:580; Wang *et al*., 2016:165). Thus, retailers are more likely to use m-commerce if it provides them with relative advantage such as reduced cost of operations, speed up in the sales (Jain *et al*. 2011:162; Wang *et al*., 2016:165), or increased sales (EY, 2015:6; Huang, Lu & Ba, 2016:265), strengthened customer loyalty and satisfaction (EY, 2015:6; Kalaivani, 2020:5947), expanded consumers' base, and increased competitive differentiation (EY, 2015:6).

4.2.3. Technology characteristics

The technology on TTF research has been clearly defined as a tool (i.e., mobile-commerce devices, software in the context of the present study) that one uses to carry out a task (Goodhue & Thompson, 1995:216; Vongjaturapat, 2018:40). However, technology characteristics construct on m-commerce research have

been analysed as technology characteristics (Lee *et al*., 2004:145), personal digital assistant m-commerce systems (Lee *et al*., 2007:98) and tool functionality (Shih & Chen, 2013:1017). According to Lee *et al*. (2004:144), the measures for the technology characteristic "represent the quality of the mobile technology" used to execute the business m-commerce activities. Therefore, the technology characteristics is deemed to be critical because brick-and-mortar retailers will require functionalities of mobile commerce systems that enable them to carry out tasks specific requirements (Zheng, 2007; Gebauer *et al*., 2010; Yuan *et al*., 2010; Lembach & Lane, 2011).

4.2.4. Fit conceptualisation

The basic fit operationalization of the TTF construct is determined through theoretically analysing the correspondence between task requirements and technology functionality (Goodhue & Thompson, 1995:218; Gatara & Cohen, 2014:324; Vongjaturapat, 2018:39). In other words, the dimensions of the TTF construct reflect the net result of the interactions between the two constructs (task characteristics and technology characteristics) (Goodhue & Thompson, 1995:218). However, TTF is proposed as a critical determinant factor of the adoption of m-commerce because in the TTF construct, the technology is seen as an enabler, in which the consequence of the correspondence between task and technology has implications on the use of technology in the business. In this regard, the fit between the characteristics of the retailer's m-commerce tasks and the functionalities of m-commerce systems constitutes the primary determinant of business use.

4.3. The environment context from TOE theoritical perspective

The environment context construct of the TOE framework (Tornatzky & Fleischer, 1990) reflects the extent to which the external characteristics of the business environment account for the use of the new innovation. For the environment context, three determinants were identified to be relevant to the adoption of m-commerce for brick-and-mortar retailers, i.e., policy and regulation, critical mass and competitive pressure.

4.3.1. Policy and regulation

Policy and regulation reflect the demand for state and international laws, which govern digital business operations (e.g., mobile commerce) and the use and storage of data/information in each business sector or industry. Prior research

has observed that government policies and regulatory support are critical for the adoption of m-commerce (Lu *et al*., 2015:294; Chau & Deng, 2018:8), suggesting that government interventions may speed up the process of IT diffusion across the country (Lu *et al*., 2015:294; Kamble *et al*., 2019:165).

4.3.2. Critical mass

Critical mass is considered when adopting technology is at a tipping point, at that level, the adoption becomes self-sustaining (Wang *et al*., 2016:166). Critical mass represents the popularity of online shopping, the groups of potential online customers that are smartphones/tablets and internet users (Kapurubandara & Lawson, 2006).

4.3.3. Competitive pressure

Competitive pressure reflects the extent to which an organisation is affected by industry members' pressure to use the technology. For example, brick-and-mortar retailers operate in a very competitive sector with varied retail business models and formats. Due to competition, a business may identify the need or be forced to leap at the opportunity to adopt m-commerce to stay ahead or to remain in the market (Chandra & Kumar 2018:244).

4.4. Retailers organisation context

The organisation context reflects the strategic organisational value, design characteristics and resource characteristics that promote the use of a new technology. Among other factors, the organisation context is concerned with the formal and informal links between the staffs, the managerial structure, the nature of centralisation (Zhu & Kraemer, 2005:61; Lippert & Govindarajulu, 2006:147; baker, 2011; Lu *et al*., 2015:306; Wang *et al*., 2016:163) The critical determinants of the use of m-commerce identified for retailers' business context are top management support, technology competence, and task technology characteristics.

4.4.1. Top management support

Previous research on TOE has analysed senior management favourable response or attitude towards the integration of m-commerce as a critical determinant of adoption (Lu *et al*., 2015:293; Wang *et al*., 2016:165). Previous research has noted that businesses are more likely to adopt m-commerce when top managers are interested in creating a vision that incorporates m-commerce

adoption in it (Wang *et al*., 2016:165). Top management support would show commitment to the integration. Thus, if they support, they will also take responsibility for the risks involved in gathering the resources needed for the integration (Lu *et al*., 2015:294).

4.4.2. Task characteristics

In general, task characteristics in TTF research have been characterised through the length of time a task would require to be performed, for example, time criticality (Gebauer *et al*., 2010:261; Yuan *et al*., 2010:125; Gatara & Cohen, 2014:333), or time-dependency (Junglas, 2003). Moreover, task characteristics have been characterised by the number of times the task regularly occurs in a particular job, namely frequency of practice (Gebauer & Shaw, 2004) and task routineness (Gebauer *et al*., 2010). The characteristics of tasks are also analysed as task interdependence, meaning the degree to which workers depend upon each other to accomplish their tasks (Goodhue & Thompson, 1995:222, Zheng, 2007; Gebauer *et al*., 2010:261; Gatara, 2016). However, task characteristics were proposed among the critical determinants of the adoption of m-commerce because m-commerce technology is utterly reliant on tasks. Therefore, the lack of business-related tasks to be performed on the mobile channel means no fit between the technology and business. And if there is no fit, there is no use of m-commerce. Therefore, brick-and-mortar retailers must see the need for performing a series of activities on the digital ecosystem by identifying the relevant tasks to be supported by the functionality of m-commerce.

4.4.3. Technology competence

Technology competence has been analysed as an integrative dimension of the organisational context construct. It constitutes a result of the internal organisational resources, such as the technology infrastructure and personnel, and their associated characteristics that will facilitate the adoption of the innovation. To some researchers, the organisational resources associated with m-commerce adoption would be based on existing IT infrastructure, employees with m-commerce-related skill, facilities for providing m-commerce-related training to employees (Zhu & Kraemer, 2005:65; Picoto *et al*., 2014:573; Wang *et al*., 2016:171; Prabowo *et al*., 2018:310). Firms that reach a high level of technological competence, i.e., are endowed with IT professionals and IS, is believed to have the foundation for the use of mobile channel (Martín *et al*., 2012:959; Wang *et al*., 2016:166). In that case, they might also have an

increased interest in the use of m-commerce (Martín *et al*., 2012:959; Wang *et al*., 2016:166).

4.5. Support for the proposed links

Analysing the theoretical perspective of the proposed framework suggested that all the determinants (i.e., policy & regulation, critical mass and competitive pressure) that constitute the environment context construct are critical for the use of m-commerce by brick-and-mortar retailers (Picoto *et al*. 2014:582; Gangwar *et al*., 2015:130; Lu *et al*., 2015:294; Wang *et al.,* 2016:171; Chau & Deng, 2018:8; Prabowo *et al*., 2018:310; Kamble *et al*., 2019:165). Furthermore, regarding the technology context construct, the present paper posits that the proposed determinants i.e., data security, task technology fit and relative advantage, are critical for brick-and-mortar retailers to adopt mobile commerce (Goodhue & Thompson, 1995; Gebauer & Shaw, 2004; Yen *et al*., 2010:912; Lu *et al*., 2015:294; Wang *et al*. 2016:165; Chandra & Kumar, 2018:247). However, the study also posits that the technological characteristics positively influence the TTF (Dishaw & Strong, 1999:13; Yen *et al*., 2010:913; Prabowo *et al*., 2018:307). Furthermore, this study proposes that the determinants, i.e., top management support and technology competence, within retailer context construct are critical for the adoption of m-commerce by brick-and-mortar retailers (EY, 2015:4; Lu *et al*., 2015:294; Wang *et al*., 2016:171; Caro *et al*., 2020:52) and that task characteristics positively influence the TTF (Goodhue & Thompson, 1995; Gebauer & Shaw, 2004; Lee *et al*., 2007; Yen *et al*., 2010:913).

5. THE PROPOSED FRAMEWORK FOR THE ADOPTION OF M-COMMERCE

Based on the reviewed literature of the factors that influence organisations' adoption of m-commerce, this section proposes a conceptual framework to deal with the complexities surrounding the adoption of m-commerce by brick-and-mortar retailers. The framework is based on two theoretical foundations: The Technology-Organisation-Environment (TOE) and Task-Technology Fit (TTF) models. Despite the TTF model and TOE framework's prominence, their flaws have been identified. The TTF model is not tailored as a business technological evaluation model. In contrast, it is a diagnostic tool to evaluate technological fitness for individual use and performance (Goodhue & Thompson, 1995; Zheng, 2007; Gebauer *et al*., 2010; Gatara, 2016). However, the TOE framework explains the technology adoption in the context of a business but is criticised for

having the characteristic of a generic or non-context-specific framework (Gangwar *et al*., 2015:111; Wang et al., 2016:165), which should be strengthened by integrating it with more purpose-built models to overcome its limitations (Gangwar *et al*., 2015:111). In essence, this study presumes that the TTF model constructs can harmonise with the TOE framework. The study defends that tasks characteristics omitted from the TOE constructs or dimensions are highly relevant to the use of m-commerce by brick-and-mortar retailers. Therefore, as a remedy for removing the barriers to use m-commerce, the proposed framework also includes elements of the Innovation Diffusion Theory (IDT).

Therefore, the framework proposed below presents three constructs relevant to explain the critical factors of m-commerce adoption for the brick-and-mortar retailers, which are the environment context, retailer context and technology context. Thus, determinants within these constructs shall exist in a retailer's business environment to effectively use the mobile shopping channel. The proposed constructs and related determinants are discussed below.

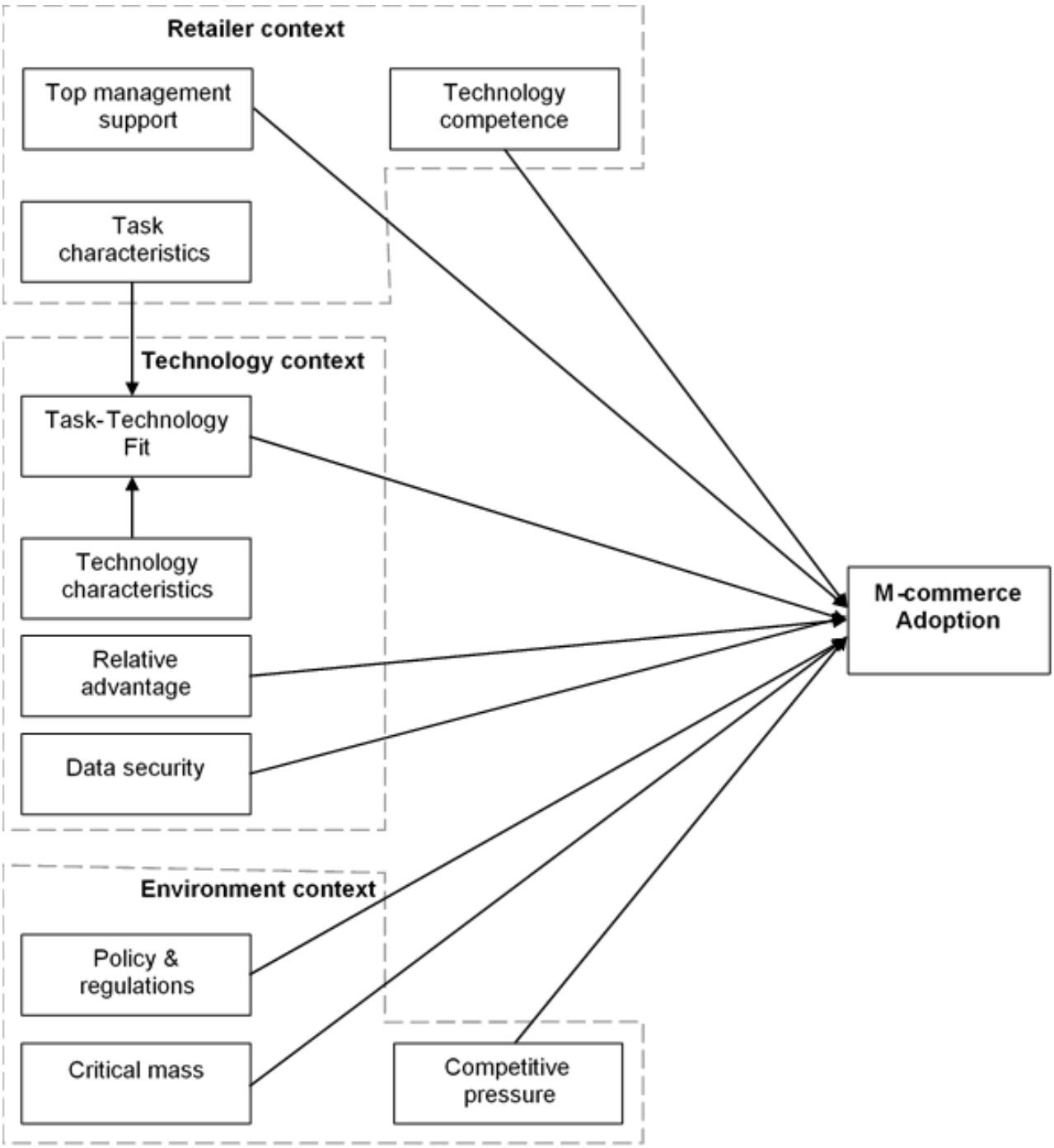

Figure 1: Proposed determinants of m-commerce use for retailers

6. CONCLUSION

By employing the scoping literature review strategy, this study critically collected empirical literature-based organisational adoption/use of m-commerce, successfully formulated and applied the inclusion/exclusion criteria for selecting relevant studies and analysed the eligible articles. Thus, the study proposed a framework based on two theoretical foundations, the TOE framework and the

TTF model. The proposed framework serves as a solution to prior studies limitations and as theoretical support for the explanation and further investigation of the critical determinants of the adoption of m-commerce for brick-and-mortar retailers. This article adds to our understanding of the historical and contemporary developmental determinants of technological innovation use/adoption. It may provide insight into retail practitioners' m-commerce usage/adoption trends that fit their business models. It may also assist brick-and-mortar retailers in understanding the complexities surrounding m-commerce and encouraging them to fully participate in the digital ecosystem.

However, this paper is not without limitations. The paper reviewed and reported on a specific array of peer-reviewed academic studies. Thus, it only provides a preliminary understanding of the critical issues concerning the adoption of m-commerce in the retail business context. Therefore, the proposed framework should undergo an array of empirical tests in different contexts, retail industries. Moreover, as the use of m-commerce by brick-and-mortar retailers is a new phenomenon, the critical determinants of the adoption of m-commerce are also subjected to investigations within qualitative approaches to understand the phenomenon from a different standpoint. Due to the inclusion and exclusion criteria particularly applied in this study, there might be a slight bias in selecting eligible studies. Therefore, further studies should consider the critical determinants of adoption proposed in this study by integrating them with other determinants relevant to the retailer's setting but were not discussed in this paper and put them to empirical tests.

DISCLOSURE OF CONFLICT

The authors declare that they have no conflicts of interest.

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