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Unearthing Antecedents of e-commerce Adoption in a Developing Country: Towards a Conceptual Model

DOCTORAL DISSERTATION

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Dedication

I dedicate this dissertation to my parents and my wonderful wife

Acknowledgement

In September 2017, when I started my PhD journey, I realized this journey is mine, but it will affect many people in and around my life. Indeed, having started alone, many great and beautiful people have assisted in diverse ways to this journey, of which I am most grateful. First, I want to express my gratitude to my mentor and supervisor, Dr Kovacs Balazs, assistant professor and lecturer at the Faculty of Business and Economics at the University of Pecs, for his counsel and direction at every phase of this research. Without his guidance, it would have been challenging to advance this research work and transform it into its final shape. I am honoured to have been his student.

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List of Acronyms and Abbreviations

AGFI	Adjusted Goodness of Fit Index
AVE	Average Variance Extracted
B2B	Business-to-Business
B2C	Business-to-Costumers
BIN	Behavioural Intention
C2C	Customer-to-Customer
CFI	Comparative Fit Index
CR	Composite Reliability
DC	Developing Countries
DoI	Diffusion of Innovation
E-commerce	Electric commerce
EFE	Effort Expectancy
FAC	Facilitating Conditions
FMW	Familiarity with Vendor
GFI	The Goodness of Fit Index
ICT	Information and Communication Technology
ICT4AD	Information Communication Technology for Accelerated Development
IDT	Innovation Diffusion Theory
IS	Information Systems
ITU	International Telecommunication Union
KMO	Kaiser-Meyer-Olkin
MM	Motivational Model
MPCU	Model of PC Utilisation
NFI	Normed Fit Index
NPC	National Population Council
PBC	Perceived Behavioral Control
PCI	Perceived Characteristics of Innovation
PEE	Performance expectancy
PEOU	Perceived Ease of Use
PeRM	Perceived e-readiness Model

PLS	Partial Least Square
PU	Perceived Usefulness
RBV	Resource-Based View
RMSEA	Root Mean Square Error of Approximation
SCT	Social Cognitive Theory
SEM	Structural Equation Modelling
SN	Subjective Norms
SOCI	Social Influence
SPSS	Statistical Package for Social Sciences
SRMR	Standardized Root Mean Square Residual
TAM	Technology Acceptance Model
TCT	Transaction Cost Theory
TOE	Technology Organization and Environment
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UNCTAD	United Nations Conference on Trade and Development
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor
WHO	World Health Organization
WQ	Website Quality

Statement of Original Authorship

I declare that this dissertation has not been previously submitted for a degree at any other educational institution. This dissertation contains no material previously published except where due reference is made to the best of my knowledge.

Signed: ……

Date: ……

ABSTRACT

E-commerce over time has been a strategy for rapid business development, especially in developed economies. The recent proliferation of the internet in developing economies has made e-commerce an exciting subject to address. E-commerce has bridged the disconnect between consumers and sellers via the internet. Consumers can reach many online vendors in the comfort of their geographical location. In return, online vendors can present a catalogue of products to a wide range of consumers without the hassle of being with the consumers physically. Though e-commerce is touted as a game-changer in commerce, its wide acceptance and use remains limited in developing countries. In the current literature, factors that influence consumers' behaviour towards e-commerce adoption are not fully understood.

The research aims to enrich our understanding of the antecedents to the actual use of e-commerce in a developing country's context, focusing on Ghana. This research extended the Unified Theory of Acceptance and Use of Technology model by enriching it with external variables (website quality and familiarity with an online vendor) to propose a new conceptual model. This research also investigated the moderating influence of online trust and online security on the relationship between behavioural intention and the actual usage of e-commerce. With a survey of 540 respondents, the study used the SmartPLS SEM software and applied the partial least square structural equation technique to examine the hypothesized relationships.

The findings suggest that performance expectancy, effort expectancy, facilitating conditions, website quality, and familiarity with an online vendor significantly affect the behavioural intention to adopt e-commerce. Consequently, the findings suggest a significant association between behavioural intention and actual use of e-commerce. The findings also revealed that online trust and online security have a significant direct relationship with the actual use of e-commerce. Another salient finding also indicates that online security has a significant effect on online trust. About the moderating effects, the results indicate that online trust significantly moderates the relationship between behavioural intention and the actual use of e-commerce. On the other hand, online security had an insignificant moderating effect on the relationship between behavioural intention and actual use of e-commerce. This research makes significant theoretical contributions and outlines practical implications for increasing e-commerce adoption in Ghana.

CHAPTER ONE

1. INTRODUCTION

1.1 Research Background

Lately, the ownership and use of mobiles and internet devices across the globe has increased tremendously. According to the International Telecommunication Union (ITU) (2020), 70% of the world population uses mobile and internet devices. In a country like Ghana, it is opined that 8 out of 10 Ghanaians are mobile and internet device users (ITU) (2020). Most organizations worldwide align their business processes with these technologies due to the cost benefits that come with them, making e-commerce the mainstay of business today (Boateng, 2010; Wang et al., 2016). The covid-19 global pandemic has also changed consumers' behaviour towards online channels, as more consumers now resort to online purchases, and this new paradigm shift is likely to linger post-pandemic. By far, Europe is the most prepared region for e-commerce, according to UNCTAD's Business-to-Consumer (B2C) E-commerce Index. According to the UNCTAD Business-to-Customer (B2C) E-commerce Index (2019), European countries dominate the top 10 countries' readiness to engage in e-commerce. Whereas developing countries, especially in Africa, are predominantly ranked low. Countries like the Netherlands, Switzerland, Finland, United Kingdom, Denmark, Norway, Ireland, and Germany have an e-commerce index of 96.4%, 95.5%, 94.4%, 94.4%, 94.2%, 93.4%, 93.3%, and 92.5%, respectively. Studies have shown that inadequate national policies for e-commerce development, inadequate investment in telecommunication infrastructure, high cost of internet data, and lack of legal and economic regulatory climate, as well as unreliable postal service, are responsible for the low e-commerce adoption in developing economies (Agwu and Emeti 2014; Eraslan et al. 2016; Heang and Khan 2015).

Investigating e-commerce adoption in a developing country like Ghana, where its adoption is relatively low, is essential if we have to draw a framework and policy to increase e-commerce presence in developing countries. One disadvantage of brick-and-mortar (buyers and sellers meeting face-to-face for a transaction) is the problem of reach, meaning, sellers are not able to reach a myriad of incumbent consumers and potential consumers in real-time due to limited space for the transaction, mainly within the confines of an office or store. More so, consumers are limited in their interaction with vendors in the brick-and-mortar.

Another downside of the brick-and-mortar is the lack of 24h a day and seven days a week service. E-commerce removes the geographical distance between consumers and vendors, facilitating online transactions at any point in time.

Moreover, social media handles such as Twitter, Instagram, and Facebook have made it easier to reach consumers. Second, e-commerce facilitates 24 hours a day and seven days a week service. E-commerce enhances trade anytime and anywhere without geographical and physical barriers. E-commerce has a strong presence in developed countries, whereas its presence in developing countries is low. Research by Esselar & Miller (2002) showed that unstable and unreliable political, social, economic, and technological conditions are at the fulcrum of the slowness of e-commerce adoption in many developing countries. However, Esselar & Millar's finding is about two decades old, and the context from which they drew their conclusion might have changed. Economic progress, political shifts, demographic trends, and technological advances are reshaping emerging markets, and these factors may also influence e-commerce adoption in these regions. Therefore, a new study to investigate the adoption of e-commerce in developing countries cannot be overemphasized.

Many theories and research models have been used to investigate individual technology adoption in various contexts. For example, research models like the technology acceptance model (TAM), technology organization and environment model (TOE) have been used to investigate technology adoption (Scherer et al., 2019; Kamal et al., 2020; Fedorka et al., 2019; Cruz-Jesus et al., 2019; Kandil et al., 2018). Researchers have also employed the universal theory of acceptance and use of technology (UTAUT), diffusion of innovation (DoI), and the DeLone and McLean's information systems success model to investigate technology adoption, including e-commerce (Persada et al., 2019; Liebenberg et al., 2018; Rahi et al., 2019; Min et al., 2019; Mohammadi, 2015; DeLone and McLean, 2004). This current study extends the classical UTAUT model by enriching it with two external variables, i.e., familiarity with an online vendor and website quality, to investigate the adoption of e-commerce in Ghana. Furthermore, this study assesses the moderating effect of trust and online security on the relationship between behavioural intention and the actual use of e-commerce.

Many businesses across the globe make use of electronic commerce to enhance their business coverage and reach. These fields of businesses including but are not limited to;

- Airline Industry (in the case of booking and paying for tickets online)

- Insurance Industry (in the case of purchasing insurance products online)
- Credit/debit card information (using the credit and debit cards to transact business online)

E-commerce can be represented as B2B (business-to-business), C2C (customer -to -customer) or B2C (business -to -customer). The scope of this study is on the B2C e-commerce model.

1.2 The motivation for the research

Many studies on electronic commerce exist in the literature (Pobee & Opoku, 2018b; Duncombe & Boateng, 2009; Shahrokhi, 2008; Hughes & Lonnie, 2007; Shieh et al., 2014). Hong & Kang (2011) studied e-commerce adoption in Korea and the United States from the lens of the unified theory of acceptance and use of technology (UTAUT). The finding showed that the effect of effort expectancy on behavioural intention was higher in the United States. One reason for this could be attributed to the fact that America is a technology and innovation giant in the world today, and as a result, a technology that will relieve them from physical and mental stress in their daily transactions is something they would like to pursue. Another study by Tarhini et al. (2016) applied the UTAUT model to understand the customers' acceptance and use of internet banking in Lebanon. Lestari (2019) measured e-commerce adoption behaviour among gen-z in Jarkata and revealed a more substantial relationship among self-efficacy, perceived usefulness, attitude, intention, and e-commerce adoption. Lestari (2019) suggested that future research consider other variables that might directly or indirectly affect e-commerce adoption. In filling this gap, this study explores website quality and familiarity with online vendors as variables that might impact consumers' e-commerce adoption in addition to the classic variables of the UTAUT model. The classic UTAUT model and its variables have been applied directly to many technology adoption studies with little or no refinement. Therefore, there is the need to extend and enrich the model by considering other external variables that can augment the original variables of the UTAUT to predict individual behavioural intention to adopt a technology.

Consequently, this study incorporates familiarity with an online vendor and website quality as variables to the UTAUT model. Furthermore, the study assessed the moderating effect of trust and online security on the relationship between behavioural intention and the actual use of e-commerce to adopt e-commerce. To date, no research, arguably, has investigated the

moderating impact of trust and online security on the relationship between behavioural intention and actual use of e-commerce. This research fills this gap in the literature.

In the area of the research methodology used to study e-commerce adoption, Duncombe & Boateng (2009) classified eighty-four (84) research articles, and their finding revealed forty-two (42) articles were analyzed at the macro-level (national level), whereas thirty-four (34) at the meso-level (organizational level), leaving just eight (8) at the micro-level (individual level). Dahbi & Benmoussa (2019) studied the factors that inhibit SMEs from adopting e-commerce in Morocco. The study revealed that financial and technological factors are the critical inhibitors of e-commerce adoption, followed by cultural and organizational factors. One limitation of their study that serves as an avenue for future research is the level of analysis. Dahbi & Benmoussa (2019) analyzed their study at the meso-level focusing on SMEs. Dahbi & Benmoussa (2019) corroborate Duncombe & Boateng (2009) findings that show that meso-level studies on e-commerce adoption exceed micro-level studies. There is, therefore, a level of analysis gap that needs to be filled. This current study investigates e-commerce adoption at the micro-level (consumer level) to enhance our knowledge of the critical factors influencing e-commerce adoption by consumers in developing countries. Following the literature classification of methodological approaches to e-commerce adoption studies, Duncombe & Boateng (2009) revealed that twelve (12) of the studies adopted the quantitative approach, twenty-five (25) adopted the mixed-method approach, and thirty-six (36) adopted the qualitative approach. A decade after the published work of Duncombe & Boateng (2009), Dahbi & Benmoussa (2019) suggested that future research embark on a large-scale survey to triangulate their qualitative findings. The findings of Duncombe & Boateng (2009) show evidence of a method gap in e-commerce literature. Perhaps, most technology adoption researchers ascribe to the constructivist/interpretive paradigm and its philosophical assumptions (ontology, epistemology, methodology). These world views of qualitative researchers may skew their research findings because their perception of reality and how it can be measured is different from that of other paradigms. With the diminutive quantitative research, more substantial quantitative claims cannot be made about the adoption of e-commerce in developing countries until further research using the quantitative approach has been done. As a result, this current study adopts a positivist and a quantitative approach to investigate e-commerce adoption in Ghana.

The novelty of this study lies in the gaps that exist in previous studies. First, this study enriched the classical UTAUT model by extending it with two external variables, i.e.,

website quality and familiarity with an online vendor, hence proposing a conceptual model. Second, this study explores the moderating effect of online trust and online security on the relationship between behavioural intention and actual use of e-commerce, a phenomenon that previous researches have overlooked. Third, the survey of literature revealed diminutive quantitative research on e-commerce adoption in developing countries. This study steps in to apply a quantitative approach to investigating e-commerce adoption in Ghana.

1.3 Research purpose

This study proposes a conceptual model to explore the antecedents of electronic commerce adoption in developing countries, focusing on Ghana. Furthermore, assess the moderating effect of trust and online security on the relationship between behavioural intention and actual use of e-commerce.

1.4 Research objectives

1. To investigate the determining factors of e-commerce adoption in Ghana.
2. To investigate the moderating effect of trust and online security on the relationship between behavioural intention and actual use of e-commerce.
3. To assess whether online security has a direct influence on the trust of Ghanaians to adopt e-commerce.

1.5 Research Questions

1. What are the determining factors of e-commerce adoption in Ghana?
2. What is the moderating effect of trust and online security on the relationship between behavioural intention and actual use of e-commerce?
3. Does online security directly influence the trust of Ghanaians to adopt e-commerce?

1.6 Significance of the study

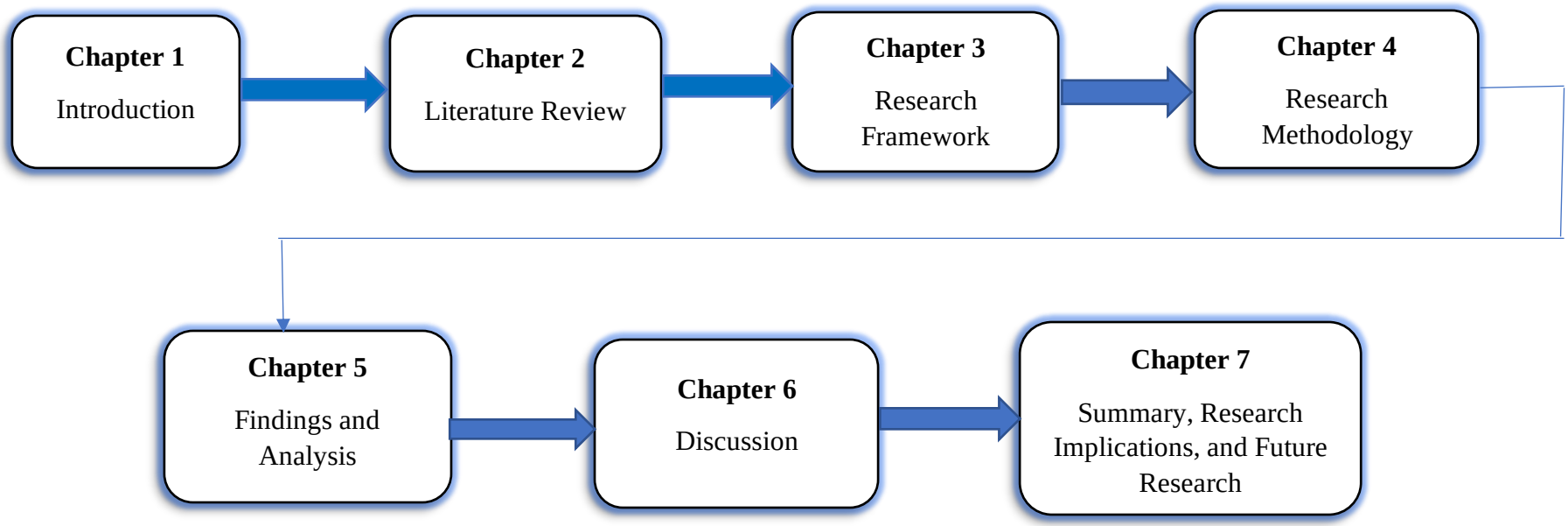
The significance of this study can be viewed along three (2) strands: theory and practice. Concerning its theoretical significance, this study contributes significantly to knowledge by enriching the UTAUT model by incorporating additional external variables (website security, familiarity with a vendor, online trust, and perceived online security). The inclusion of these variables advances our knowledge of the factors that influence e-commerce adoption. Trust and security are essential variables considered during trade, especially online trade, where parties interact virtually. Therefore, it is essential to study the impact of trust

and online security on e-commerce adoption, as these impacts have barely been researched. Hence, this study provides insights into the effect of trust and security on e-commerce adoption. Concerning its practical significance, the findings of this research provide e-vendors and website business designers with the critical factors that influence consumers to adopt online shopping channels in the context of a developing country.

1.7 Organization of the study

The next chapter, i.e., Chapter 2, provides a literature review on e-commerce in developing countries. The literature review helped build a solid theoretical and conceptual base on which the research can stand. The aim is to identify gaps in the literature that defines the agenda for the dissertation. Chapter 3 discusses and reviews the UTAUT model's tenets and how they were measured and operationalized in the study context. Most importantly, two external variables (familiarity with vendor and website quality) were integrated into the UTAUT model to develop a conceptual model for this dissertation. Also, trust and online security were moderators to assess their impact on the relationship between behavioural intention and actual use of e-commerce. Chapter 4 presents the methodology and the data collection procedure, and the method of analysis. The set of philosophical assumptions that governed the research was explained. Chapter 5 presents the findings and analysis of the research. Chapter 6 provides a discussion of the findings that answer the research questions. Finally, chapter 7 summarises the dissertation by reflecting on the theoretical and practical implications vis-à-vis future research directions. A visual structure of the research process is presented in Figure 1.1.

Figure 1.1 A Visual structure of the research process



Source: Author's construction

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

In the previous chapter, we realized that though mobile and internet devices have increased in developing countries (DC), empirical evidence and theoretical frameworks analyzing the factors influencing individual adoption of these technologies for commerce have not been fully explored. Nevertheless, a few studies, for example, Almousa (2013), Naude (2020), Omoola and Oseni (2016), and Awiagah et al. (2015), have investigated e-commerce adoption in developing countries from various dimensions, including privacy, consumer protection, and technology, organizational, and environmental factors influencing e-commerce adoption. However, these studies validated existing theoretical models in different contexts without proposing or adding new variables that can enhance our understanding of e-commerce adoption. Therefore, the literature thirsts for new research to enrich the existing knowledge and provide an enhanced framework for understanding e-commerce adoption in DC. In this chapter, dominant issues that have been investigated by previous research were reviewed, theories and frameworks used as investigative lenses were also reviewed, and propositions were made to enhance some of the models. Methodological approaches employed to investigate e-commerce adoption and the level of analysis were also discussed. This kind of analysis and review is essential in uncovering what we know and need to know in the e-commerce literature. It also unravels research gaps in previous studies, as will be seen later in this chapter. These gaps were used as a conduit for this study.

2.2 Framing E-commerce Research

2.2.1 E-commerce - An Introduction

Customers' availability and reach of products and the transformation of businesses by reaching many consumers and potential consumers can be credited to the internet. E-commerce, e-business, and e-tailing are names given to the act of conducting business transactions online (Ramzy et al., 2011). Traditional business operations such as order taking, inventory management, payment for goods were performed manually. The advent of the internet revolutionized business processes by providing a digital approach. E-commerce "refers to commercial trade activities carried out by electronic methods, the electronification

of traditional trades" (Qun, 2009, p.8). On one side of the coin, e-commerce has become one of the crucial business developments (Iglesias-Pradas et al., 2013) because it gradually replaces traditional selling and brick-and-mortar stores.

Moreover, on the other side, even though e-commerce is gradually replacing brick-and-mortar stores, there are some dimensions of it, such as trust and online security, that affect consumers' behavioural intention towards its adoption. Liu & Wei (2003) mentioned uncertainty as one variable that affects consumers' attitudes towards e-commerce adoption. According to Liu & Wei (2003), the delay between order and product delivery reduces consumer trust in e-commerce. Iglesias-Pradas et al. (2013) also found the process of handling defective products on arrival as a bottleneck to e-commerce adoption. These findings suggest that trust and perceived online security are critical factors that need to be investigated to understand consumers' e-commerce adoption. In developing countries where technological advancement and penetration are relatively low compared to developed countries, online building trust is critical in advancing e-commerce activities. When the perceived trust is high, it may positively influence behavioural intention to adopt e-commerce.

The rate of e-commerce adoption between developed and developing countries differ significantly. The massive growth of the internet and the ever-decreasing price of internet connectivity in the developed countries has led to their massive adoption of e-commerce (Ramzy & Eldaham, 2016). The same cannot be said about developing countries, especially African countries, where the adoption and diffusion of e-commerce are relatively low. It is reported to be similar to how it was in the United States some twenty years ago (UNCTAD, 2020). This imbalance has led to a digital divide between developed and developing countries, particularly African countries, where individuals prefer conventional trading to online business (UNCTAD, 2013). Perhaps, the inadequate national policies for e-commerce development, inadequate investment in telecommunication infrastructure, high cost of internet data, and lack of legal and economic regulatory climate and unreliable postal service are responsible for the low adoption of e-commerce in developing countries. Molla & Licker (2005b) revealed that though a reasonable number of studies have investigated the inhibitors of e-commerce adoption in developing countries, most of these studies adopt a macro and meso-level perspective to their analysis.

Moreover, this trend has been supported by many recent studies such as Rahayu & Day (2015), Kurmia et al. (2015), Dahbi & Benmoussa (2019), and Alsaad & Taamneh (2019). One of the issues lacking in the e-commerce literature are studies that take a micro-level insight into e-commerce adoption in developing countries. This current research investigates the determining factors of e-commerce adoption in Ghana at the micro-level (consumer level). This study further investigates the moderating effect of online trust and online security on the relationship between behavioural intention and actual use of e-commerce.

Extant literature has revealed culture as a critical factor influencing behavioural intention (Lin et al., 2020; Tang & Zhu, 2020; Nakayama & Wan, 2019). The issue of culture is vital as it influences behaviour. Therefore, understanding culture and its impact on e-commerce adoption are critical. Countries with a culture of trusting their technological and infrastructural systems tend to adopt e-commerce more than countries without these facilities readily available (Hood et al., 2020; Zhao et al., 2020). These findings are similar to Iglesias-Pradas et al. (2013), who revealed trust as the critical inhibitor of e-commerce in developing countries. Could it, therefore, be concluded that developing countries do not have the culture to trust in their own technical and infrastructural systems? Ramzy & Eldahan (2016) assessed the impact of culture on e-commerce adoption in Egypt. The study found that Egyptians' political and economic instability in the past decade increased the perception of risk on e-commerce transactions, which eventually reduced the adoption and diffusion of e-commerce in Egypt. However, it will be a hasty generalization to directly imply Egypt's situation to other countries within the sub-Saharan African region; therefore, a study to explore the effect of trust on e-commerce adoption in developing countries such as Ghana cannot be overemphasized.

Another astounding revelation in the e-commerce literature is collectivism and its impact on e-commerce adoption (Jena & Goswami, 2014). Azam et al. (2013) showed a positive relationship between collectivism and customers' perceived trust in online business. Similarly, Pitlik & Rode (2017) investigated the relationship between individualism and attitude towards government intervention and revealed that Africa is one of the world's regions with less individualistic values; thus, Africa's people are more collective in their day-to-day activities as compared to Europeans and Americans. Conflating these two studies, it is evident that though Africa has been attributed to collectivism, she has a relatively low behavioural intention towards e-commerce adoption. These paradoxical findings indicate that unexplored factors influence e-commerce adoption in developing

countries other than those suggested by Pitlik & Rode (2017) and Azam et al. (2013) that need to be investigated.

2.2.2 Classification of research on e-commerce adoption in developing countries

This literature classification aims to identify the main scientific contribution of studies on e-commerce adoption in DC and present and discuss their results descriptively. The literature selection for the review followed the two steps to gathering literature for analysis proposed by Alderson et al. (2004). These are;

1) The setting of inclusion criteria, and
2) Data source and study selection.

2.2.3 The inclusion criteria

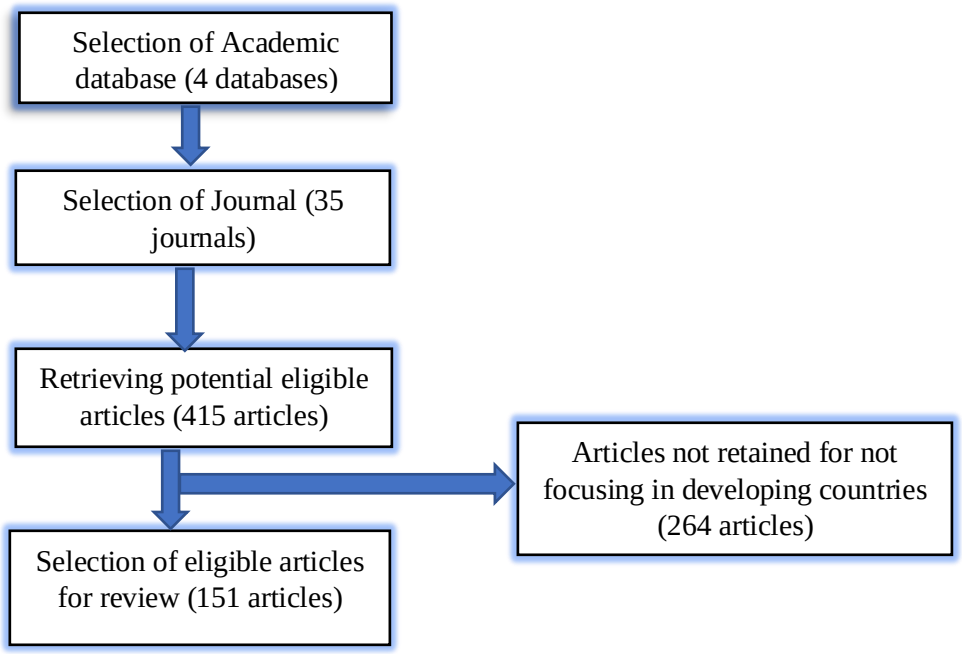
In selecting and assessing the potential articles suitable for this study, three criteria were used. First, the articles must deal with e-commerce adoption in developing countries. Articles that were not dedicated to this were excluded and not retained for review. Second, the articles must exclusively be in a peer-reviewed journal and published between 2010 to 2019. The choice of the period was arbitrary; however, technology is swiftly evolving and reshaping business dynamics. People in developing countries are beginning to adopt these technologies for their private as well as business purposes. This development has necessitated researchers to investigate the readiness to adopt e-commerce in the regions over the past decade. Third, empirical and theoretical studies are included. Other published articles, such as special issues of journals, were excluded. These retrieved articles were omitted because, after a careful examination of them, it was found that they did not focus on developing countries.

2.2.4 Data sources and studies selection

The literature search employed a four-stage strategy. First, four academic journal databases, namely; Science Direct, Jstor, Ebscohost, and Emerald, were identified, and eligible journals focusing on e-commerce were selected. All four databases provided access to 35 peer-reviewed journals. In the second stage, an advance search for articles published between 2010 and 2019 with keywords (e.g. e-commerce; adoption; internet commerce) was conducted within the journals, namely but not limited to; *electronic commerce research,*

communication of AIS, Journal of management information systems, international journal of electronic commerce, information systems research, electronic journal of information systems in developing countries, European Journal of management and business economics, Journal of electronic commerce, Journal of enterprise information management, information technology for development, e-commerce research and application, Journal of e-commerce in organizations and information development among others. Third, the references of the articles selected in stage two were perused to ensure that the articles had a strong foundation and good connection with high-ranked articles in quality journals, and by so doing, 415 potential articles were identified. At this stage, the context of the 415 articles focused on developed and developing countries. In the fourth stage, only articles with a focus on developing countries were retained. In all, 151 articles were retrieved for the review. Figure 2.1 shows the flow diagram of the systematic selection process of articles.

Figure 2.1 Flow diagram of the article selection process



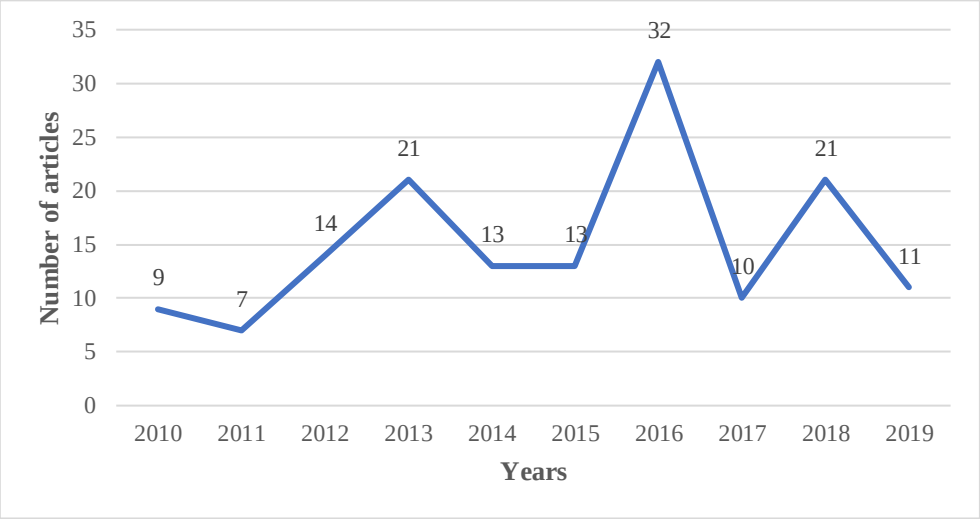
Source: Author's construction

2.2.5 Distribution of articles by year of publication

The distribution of articles under review showed 2016 as the year with the highest number of published studies on e-commerce adoption in DC with 32 articles. It is evident from figure 2.2 that the published articles on e-commerce adoption in developing countries has not been consistent. A limited number of studies in 2010 increased steadily from 2012 to 2013 and

dropped in 2014. Despite the high number of articles recorded in 2016, articles published dropped from 2017 to 2019.

Figure 2.2 Distribution of articles by year of publication



Source: Author's construction

2.2.6 Distribution of articles by countries investigated

As shown in Table 2.1, studies on e-commerce adoption in sub-Saharan Africa show Ghana and Tanzania as the least studied countries. Kenya, South Africa, and Egypt have relatively more studies on e-commerce adoption. In Asia, Indonesia has 16 studies, the highest Asian region captured in the review. Thailand had nine articles, followed by Cambodia with four articles. Egypt has the highest number of studies on e-commerce adoption in Africa during the period under review. The regional and international studies are cross-countries' research investigating two or more countries in a single study. The literature classification showed that 34 studies fall within this category.

Table 2.1 Distribution of articles by countries investigated

Countries	Number of articles	Percentage
Thailand	9	6
Azerbaijan	2	1.3
Indonesia	16	10.6
Saudi Arabia	11	7.3
Malaysia	9	6
Ghana	8	5.3
Kenya	10	6.6

Egypt	13	8.6
Cambodia	4	2.6
India	11	7.3
Mexico	8	5.3
South Africa	9	6
Tanzania	7	4.6
Regional/International	34	22.5
Total	**151**	**100**

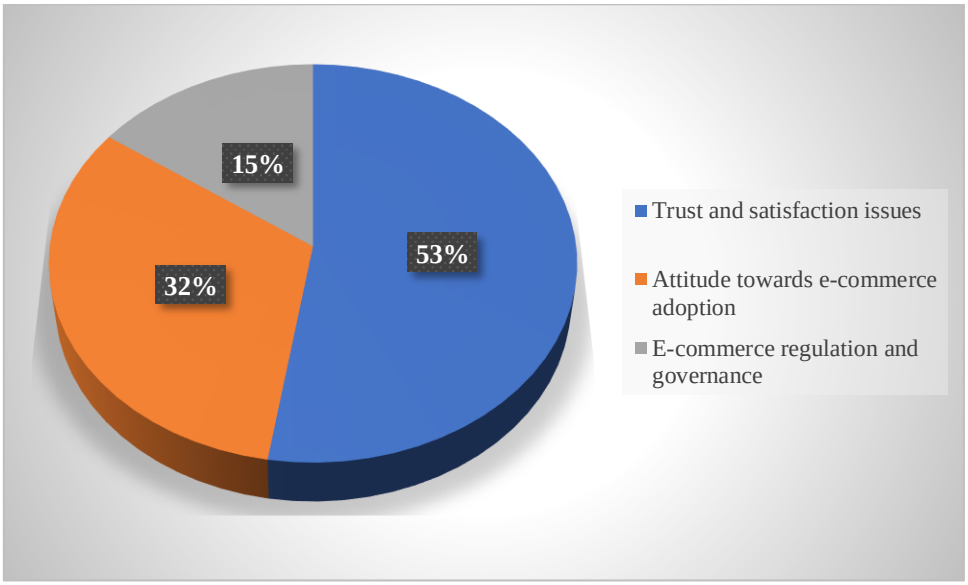
Source: Author's construct

2.3 Distribution of articles by research themes

2.3.1 Review of dominant research themes

The review of selected articles reveals three dominant themes in the e-commerce adoption literature in DCs literature. These are trust and satisfaction issues in e-commerce (79 articles, representing 53% of articles reviewed); attitude towards e-commerce adoption (49 articles, representing 32% of articles reviewed); and e-commerce regulation and governance research, which consisted of 23 articles (15%).

Figure 2.3 Distribution of articles by research themes



Source: Author's construct

2.3.2 Trust and Satisfaction Issues

Whether on initial or repurchase intention, the issue of trust and its impact on e-commerce adoption has gained attention in the e-commerce literature. Fang et al. (2014) studied trust, satisfaction, and online repurchase intention by moderating trust and satisfaction with the perceived effectiveness of e-commerce institutional mechanisms (PEEIM). According to Pavlou & Gefen (2014), institutional mechanisms are impersonal structures third parties create to safeguard online transactions. Prior research focused on the institutional mechanism in the context of initial online purchase rather than repurchase intention (Pavlou & Gefen, 2014; Pennington et al., 2013; McKnight et al., 2012b). Fang et al. (2014) introduced PEEIM in an online repurchase context. Their study confirmed that PEEIM negatively influences the relationship trust in vendor and repurchase intention. This finding supports Chong et al. (2018) that PEEIM negatively moderates trust in online sellers and repurchase intention in the context of a Chinese e-marketplace- Taobao.

Similarly, Zhang et al. (2011) studied repurchase intention in B2C e-commerce. Retaining customers that can lead to repurchase intentions has become critical to marketers; studies have shown that it costs firms twice as much to get a new customer than retaining those they already have (Kim, 2019; Chen et al., 2017; Diaz, 2017). Zhang et al. (2011) found a positive relationship between online relationship quality and repurchase intention. Also, Zhang et al. (2011) found a positive effect of perceived quality of expertise on online relationship quality. One limitation of Zhang et al. (2011) lies in their methodology that gave respondents the freedom to self-select an online vendor from whom they have a history of purchase to fill the questionnaire. In addition, the subjective influence might distort the objectivity of the responses resulting in a social desirability bias.

Studies have shown price dynamics as a significant factor influencing trust between vendors and consumers in traditional and online markets (Rekettye & Liu, 2018; Hinz et al., 2011). Hinz et al. (2011) found that consumer trust is increased when an e-vendor adopts the name-your-own-price mechanism compared to the fixed threshold price. Garbarino & Maxwell (2010) investigated customer reaction to norm-breaking pricing events in e-commerce and found that breaking the pricing strategy negatively affect consumer trust. Xia et al. (2004) refer to social norms as a critical variable in consumer response to pricing, mainly dealing with perceived fairness.

Extant studies have shown system design, information and service quality, ease of system as critical factors that influence trust and satisfaction in e-commerce adoption (Palese & Usai,

2018; Kang & Namkung, 2019; McKnight et al., 2019). Studies have shown that trust in e-commerce transactions will increase in developing countries if consumers are satisfied with the content displayed by e-vendors on e-commerce websites (Vakeel et al., 2017; Thielsch & Hirschfeld, 2019). These findings suggest that the quality of the information displayed by e-vendors positively correlates with consumer trust. To describe information on the website as quality, it has to be relevant, timely, and accurate (Lee et al., 2019). According to Eid (2011), customer satisfaction with e-commerce transactions is influenced by the quality of the information provided by the e-vendor and the website's interface quality. These findings are consistent with Palese & Usai (2018) and McKnight et al. (2019). Similarly, Phuong (2018) found information quality and ease of using the e-commerce website interface as critical determinants of consumer satisfaction.

Research has shown that the tourism industry extensively engages the internet as tourists worldwide use it to seek information and make online reservations and payments (Law et al., 2010). Lee & Morrison (2010) showed the internet to be an effective distribution channel for tourism businesses. Statista (2019) analysis revealed that 88 per cent of all hotel bookings are made via the world wide web. More so, online booking worldwide spiked by 20 per cent between 2015 to 2017, and that statistics proved that by 2020 it might grow by12 per cent (Statista, 2019). This statistic supports Huang et al. (2017) and Kim et al. (2016) study that revealed e-commerce is rapidly becoming essential support of the service management economy. Assessing website performance with content analysis technique, Cao & Yang (2016) found that consumers of tourism services in DCs are not optimizing the e-tourism due to inadequate information on tourist websites. Wen (2010) investigated the factors that affect online travel buying decisions and suggested that the quality of website design and consumer trust affected the online travel buying decision.

Likewise, Eid (2011) and Aggarwal (2020) reported that perceived trust, information quality, and interface quality are antecedents to customer satisfaction. Similarly, Agag et al. (2020) examined the effect of web assurance seal service (WASS) on perceived website trust. The study indicated that WASS positively influenced perceived trust. WASS provides a neutral third-party vision on the trustworthiness and integrity of e-vendors which studies such as Kim et al. (2016) and Van Baal (2015) have shown to allay consumers' fear of e-transaction. Trust, quality of the information provided by e-vendors on their websites, and website quality are key factors influencing behavioural intention to adopt e-commerce in developing countries. However, many research studies have significantly focused on e-commerce adoption in Asia and South American developing countries. Studies on Africa have shown

little focus on trust and its effect on e-commerce adoption. There is also the need to investigate the impact of variables such as familiarity with an online vendor, website quality, online security, and trust on behavioural intention to adopt e-commerce within the context of an African country. As a result, this current study developed and empirically tested a conceptual model focusing on Ghana. This study contributes to the literature on e-commerce, as most studies focused on developed countries. This study enriches the classical UTAUT model from a theoretical framework perspective by extending its variables to include website quality and familiarity with an online vendor. This study also empirically tests the moderating effect of online trust and online security on the relationship between behavioural intention and actual use of e-commerce. Arguably, no similar approach has been employed for e-commerce adoption in Ghana. A summary of studies that have investigated trust and satisfaction in e-commerce is provided in Table 2.2.

Table 2.2 Trust and satisfaction issues in e-commerce research

Investigated variables	Outcome variable	Reference
Online relationship quality, perceived website usability, perceived vendor expertise, perceived vendor reputation, distrust in vendor behaviour	e-Repurchase intention	Zhang et al. (2011)
Initial online trust in e-vendor, a disposition to trust, perceived interactivity, perceived risk, perceived web assurance	e-Purchase intention	Wu et al. (2010)
Security, risk	Trust	Shin & Shin (2011)
Compensation, initial trust, trust condition	Behavioural intention	Premazzi et al. (2010)
Familiarity with e-vendor, familiarity with e-commerce, satisfaction with complaint handling, trust in e-vendor, trust in e-commerce	e-Loyalty	Pizzuti & Fernandes (2010)

Adaptive threshold pricing, fixed threshold pricing, customer satisfaction	Consumer trust, purchase intention	Pengnate & Antonenko (2013)
Perceived value, perceived quality, customer expectation	Customer e-satisfaction	Nisar & Prabhakar (2017)
National culture dimension, trustworthiness dimension	Consumer trust	Hallikanen & Lauknem (2018)
Information quality, perceived risk, brand reputation, security, good online experience	e-Trust	Alam & Yasin (2010)
Perceived desirability, organizational readiness, management support, competitive pressure, trust	Intention to adopt e-commerce	Alsaad et al. (2017)
Perceived risk, perceived usefulness, online trust, website reputation, product value	Repurchase intention	Sullivan & Kim (2018)

Source: Author's construction

2.3.3 Attitude towards e-commerce adoption

McLean et al. (2020) conducted a longitudinal study to assess consumers' attitudes towards e-commerce applications over one year. The study found that consumers develop a positive attitude towards e-commerce applications over time as the e-vendors continually satisfy them and enrich their e-shopping experience. In the case of consumers who prefer to use their smartphones to shop online, the study further revealed that smartphone size influences consumers attitudes to shop online. Extant literature has revealed the technology acceptance model (TAM) as the dominant and popular model for explaining technology adoption. Perceived ease of use (PEOU) and perceived usefulness are the TAM factors that predict consumer attitude towards technology adoption. While PEOU measures the degree to which an individual perceives using technology to be free from physical and mental stress, PU measures how consumers perceive technology to bring some gains in their performance (Davies et al., 1989). Kang et al. (2015) opined that for consumers to develop a positive attitude towards e-commerce adoption, e-commerce websites' contents should be helpful,

and navigating the website's interface should be free from physical and mental stress. These findings corroborate Liu & Li (2011) and Munoz-Leiva et al. (2017). Conversely, research has shown that PEOU and PU's ability to influence technology adoption's attitude becomes weaker or stronger following the user's experience with the technology (Groß, 2016). Likewise, Peng et al. (2017) assert that consumers develop a positive attitude when they perceive the e-vendor website as helpful and give them an enjoyable shopping experience. Hence, positive perception creates a positive consumer attitude towards the vendors' websites. Throwing support for this, Jiang et al. (2016), Park et al. (2012), and Wang et al. (2010) point that both product and website aesthetics provides a superior online experience to consumers, which positively influences their attitude towards the vendors' website. While the trend has been to study the factors that influence e-commerce adoption, some studies have focused sparingly on investigating the effect of website quality and aesthetics on consumer attitude (Peng et al., 2017; Liu et al., 2017). Despite the growing interest and understanding of how website quality influences consumer attitude, no prior research has examined the impact of website quality on consumer intention to adopt e-commerce within Ghana's context. Awa et al. (2015) and Oraedu et al. (2020) call for studies investigating the relationship between website quality and consumer intention to adopt e-commerce in developing countries. Responding to this call and contributing knowledge to literature, this current study investigates website quality as one factor influencing consumer intention to adopt e-commerce in Ghana. The aim is to assess the effect of website quality on consumers' behavioural intention to adopt e-commerce.

Prior research has investigated the risk perception, and privacy concerns consumers associate with online shopping (Gurung & Raja, 2015; Ariffin et al., 2018; Rahman et al., 2017; Hong & Thong, 2013). Privacy and security concerns have been one of the major stumbling blocks to the growth of e-commerce in developing countries. These variables significantly influence consumers' attitudes towards e-commerce. A study by Gurung & Raja (2015) suggests that privacy and security affect risk perception. More so, risk perception affects attitude. Correspondingly, Ariffin et al. (2018) reported that online security risk prevents consumers from purchasing online.

In contrast, the findings of Almousa (2013) and Masoud (2013) contradicts Raja (2015) and Ariffin et al. (2018). Almousa (2013) surveyed 300 Saudi Arabian consumers and reported an insignificant effect of privacy and security risk on online shopping intention. Likewise, Masoud (2013) assessed the impact of security risk on e-shopping intention and revealed an

insignificant effect on e-shopping intention. These contradictory findings show that online security's effect on online shopping has been inconsistent in the e-commerce literature. These conflicting results call for further research into online security and its impact on online shopping behaviour. Consequently, this study examines the impact of online security on e-commerce adoption behaviour in Ghana, among other variables.

2.3.4 E-commerce regulation and governance structure

Regulation and governance refer to the legal framework by governments and other regulatory stakeholders of e-commerce to ensure that consumer protection and internet transactions are safeguarded and adequately regulated. Some studies have analyzed online transactions' national and regulatory frameworks focusing on consumer protection (Dehghan and Hagbigbi, 2014; Omoola & Oseni, 2016; Naude, 2020). Consumer protection has become a critical dimension of e-commerce. Ensuring consumers' security online is very important as security is one of the major inhibitors for using e-commerce systems. Sharing personal information such as credit/debit card numbers and home address with e-vendors via e-commerce systems call for an enhanced security/privacy so that this information does not get to the hands of unauthorized persons. E-vendors must ensure not to compromise the privacy of their consumers. Dehghan and Hagbigbi (2014) studied e-money regulation for consumer protection and reported that e-transaction is an efficient and user-friendly payment system that affords consumers the convenience to make a payment anytime. As a policy implication, Dehghan and Hagbigbi suggested governments advance regulatory frameworks for e-transactions in developing countries to ensure maximum security for online consumers. E-commerce has undoubtedly become a significant player in world business. Like many brick-and-mortar stores, solving disputes during and after online purchases by e-vendors is critical for online businesses' survival. Omoola & Oseni (2016) analyzed the perspectives of online dispute resolution legislature for consumer protection in some selected developing countries and found that a comparative legal approach with leverage on legal borrowing can help create the required legal environment for online dispute resolution. Another critical issue that needs urgent legal regulation in most developing countries is the issue of cross-border shopping. Naude (2020) studied consumer law within on legal system and across legal systems in Africa. The study found several types of hyper-vulnerable consumers that require protection.

Naude (2020) calls for stricter rules to extirpate counterfeit goods and bring consumers under consumer law protection. More so, there must be rules to maintain the quality of the product

and safety standards. Even though fragmentation of consumer law in Africa is inevitable, an attempt at some convergence level would be beneficial, especially where there is a significant cross-border interest such as e-commerce, travel, and tourism. This assertion corroborates the findings of Aguerre (2019). Research has shown that these online transaction experiences are usually enjoyed in developed countries where public policy, legal, and online security frameworks are well established (Gomez-Herrera et al., 2014; Terzi, 2011; Presthus & Sorum, 2018) compared to developing countries (Naude, 2020; Dehghan & Hagbigbi, 2014; Omoola & Oseni, 2016). This situation's national implication calls for developing countries to develop and provide an adequate legal framework to protect consumers online. A robust return policy, refund procedures, and secure online payment for consumers in developing countries cannot be overemphasized.

2.4 Methodological Approaches to e-commerce research in developing countries

The literature review shows that the qualitative approach (case study) is the most used inquiry method to investigate e-commerce adoption in DC, with 61 articles representing 40% of the articles (Table 2.3). Surveys were fairly represented with 29 articles (19%). In comparison, content analysis and mixed methods accounted for 13% and 10% of the total articles, respectively. The least represented method was a simulation and experimental study with only one (1) article. This evidence shows that most research on e-commerce adoption in DC has been studied under the constructivist paradigm lens. This paradigm has a set of philosophical assumptions (ontology, epistemology, methodology) that provide a framework for conducting their research. The world view of constructivists differs from positivists, pragmatists, and critical realists, as it dictates how to perceive and measure reality. As a result, the perception and reality of e-commerce adoption in developing countries and how it is analyzed differs depending on the researcher's paradigm. With the diminutive quantitative, simulation experiments, and mixed-method research, more substantial claims cannot be made on the antecedents of e-commerce adoption in developing countries with these methods until further studies use them to investigate the adoption of e-commerce in developing countries. As a contribution, this current study employs a survey that uses positivism principles to unravel the hidden connection between variables that predict a phenomenon. Hence, a survey approach is used to investigate the factors influencing e-commerce adoption in developing countries, focusing on Ghana. Second, assess the

moderating effect of online trust and online security on the relationship between behavioural intention and the actual use of e-commerce.

Table 2.3 Distribution of articles by research methods

Research method	Number of articles	Selected references
Survey	29(19%)	Fang et al. (2014); Ramanathan (2010); Huang et al. (2010); Zhang et al. (2011); Awiagah et al. (2015); Masoud (2013); Jiang et al. (2016); Peng et al. (2017); Kang et al. (2015); Kim et al. (2016)
Case study	61(40%)	Thompson et al. (2019); Kabanga & Brown (2017); Ong & Teh (2016); Kwak et al. (2019); Alyoubi (2015); Dehghan & Hagbigbi (2014)
Mixed methods	15(10%)	Almousa (2013); Zhu et al. (2019); Aguerre (2019)
Simulation/experimental studies	1(1%)	Hinz et al. (2011)
Content analysis	19(13%)	Terzi (2011); Lee & Koubek (2010); Huang & Benyoucef (2013); Yang (2011); Kabango & Asa (2015)

Source: Author's construction

2.5 Theoretical Framework used in the study of e-commerce adoption in developing countries

Table 2.4 shows that group 1 consists of research frameworks used to study trust and satisfaction related to e-commerce adoption. The results show that all the frameworks listed under group 1 have been relatively used to investigate satisfaction and trust issues about e-commerce in developing countries; however, the technology organization environment (TOE) framework is the most widely used. The use of the TOE framework makes knowledge contribution using this framework theoretically and practically grounded. Further studies can contribute significant knowledge by advancing e-commerce research using organizational trust theory as its constructs may generate exciting insights. Again, group 2 consists of research used to investigate attitudes towards e-commerce adoption issues in developing

countries. The technology acceptance model (TAM) is the dominant framework (12 articles) validated under this category. TAM provides a theoretical path to investigate technology acceptance readiness by individuals and organizations in developed and developing countries as a deep-rooted behavioural theory. It is therefore not surprising to see many studies adapting it as a lens for investigation. The theory of reasoned action (TRA), perceived e-readiness model (PeRM), and perceived characteristics of innovation (PCI) have been relatively used to investigate e-commerce adoption in developing countries. The least used frameworks are social influence theory, unified theory of acceptance and use of technology, and the self-determination theory. Validation of these frameworks will be an outstanding contribution to research. For example, external variables such as familiarity with a vendor, website quality, information quality, trust, and security may be integrated with the classic variables of the UTAUT model to enrich the findings that come from its application. Group 3 consists of research frameworks used to investigate e-commerce regulation and governance in DC. Unlike group 1 and group 2, group 3 has no widely used framework. This group's low application of frameworks could explain the inadequate legal framework and consumer protection regulations to safeguard and adequately regulate internet transactions in DC.

Table 2.4 Distribution of articles by research frameworks

Theoretical framework	**Constructs**	**Number of articles**
Group 1 – Trust and satisfaction		
Theory of organizational trust (Mayer et al., 1995)	Ability, Benevolence, Integrity, Trust	5
Resource-Based View (RBV) Barney (1991)	Resources, Capability, Competitive advantage	7
Diffusion of Innovation Theory (DoI) (Rogers, 2003)	Relative advantage, Compatibility, Complexity, Trialability, Observability	8

Technology Organization Environment framework (TOE) (Tornatzky et al., 1990)	Technological context, Organizational context, Environmental context	16
Group 2 – Attitude towards e-commerce adoption		
Technology Acceptance Model (TAM) (Davis, 1985)	Perceived usefulness, perceived ease of use, Behavioral intention	12
Social Influence Theory (Kelman, 1958)	Compliance, identification, and internalization	1
Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980)/ Theory of Planned Behavior (TPB) (Ajzen, 1991)	Attitude, subjective norm	8
Self-determination Theory (Deci & Ryan, 1985)	Autonomy, Competence, connection/relatedness, motivation	1
Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003)	Performance expectancy, effort expectancy, social influence, Behavioral intention, Actual behaviour	4
Perceived e-Readiness Model (Molla & Licker, 2005a)	Perceived organizational e-readiness, Perceived external e-readiness	5
Perceived Characteristics of Innovation (PCI) model (Plouffe et al., 2001)	Relative advantage, compatibility, ease of use, results demonstrability,	4

	image, visibility, trialability, voluntariness, adoption.	
Group 3 – E-commerce regulation and governance		
Transaction Cost Theory (TCT) (reviewed in Pare, 2003)	Bounded rationality, Opportunity, frequency, Uncertainty, Asset specificity.	4
Economic theory in online shopping (Mahmood et al., 2004)	Economic condition, Technological savvy, Trust, online hopping	1
DeLone & McLean IS Success Model (DeLone & McLean, 2003)	Information quality, Service quality, system quality, System use, user satisfaction, Net system benefit	3

Source: Author's construction

2.6 Distribution of articles according to the level of analysis

The classification further showed the level of analysis of e-commerce researches in developing countries. Table 2.5 shows that most of the reviewed articles were conducted and analyzed at the macro-level (national level) with 39 articles. Meso-level studies with 28 articles followed this. Micro-level studies were least represented with 16 articles. Micro-level studies are consumer-centred. They investigated issues of online shopping at the consumer level. For example, Fang et al. (2014) studied e-commerce institutional impact on trust and online purchase. In doing so, they surveyed 363 online consumers and found that the e-commerce institutional mechanism has a negative moderating effect on trust in an online vendor and online customer repurchase. Similarly, Hallikainen & Laukkanen (2018) investigated trust in e-commerce. They sampled 616 online consumers and assessed their

perception of trust in e-vendors. They found that national culture is a significant predictor of consumers' general disposition to trust.

Unlike micro-level studies, meso-level studies are firm/organizational centred. They investigate and assess the perspectives/views of firms on e-commerce. Awiagah et al. (2015), for instance, unpacked the factors that affect e-commerce adoption among SMEs in Ghana. Haven applied the Technology Organization and Environment Model with a social constructivist view; they found that the environmental factor, in this case, government support is the strongest predictor of SMEs' intention to adopt e-commerce. Likewise, Choshin and Ghaffari (2017) found customer satisfaction, transaction cost, infrastructure, knowledge, and information as factors that influence e-commerce success.

Unlike micro and meso-level, macro-level studies take a national perspective to e-commerce adoption. For example, studies such as Almousa (2013), Alsaad & Taamneh (2019), Ayoubi (2015), and Kwak et al. (2019) have investigated national policies and how they impact a country's e-commerce adoption.

This evidence shows the prevalence of a level of analysis gap in the literature that should attract researchers' attention. Future research should focus on individuals' e-commerce adoption behaviour and factors influencing developing countries' behaviours to bridge this gap. Consequently, this current study takes a micro-level perspective to examine the factors influencing e-commerce adoption in Ghana.

Table 2.5 Distribution of articles by the level of analysis

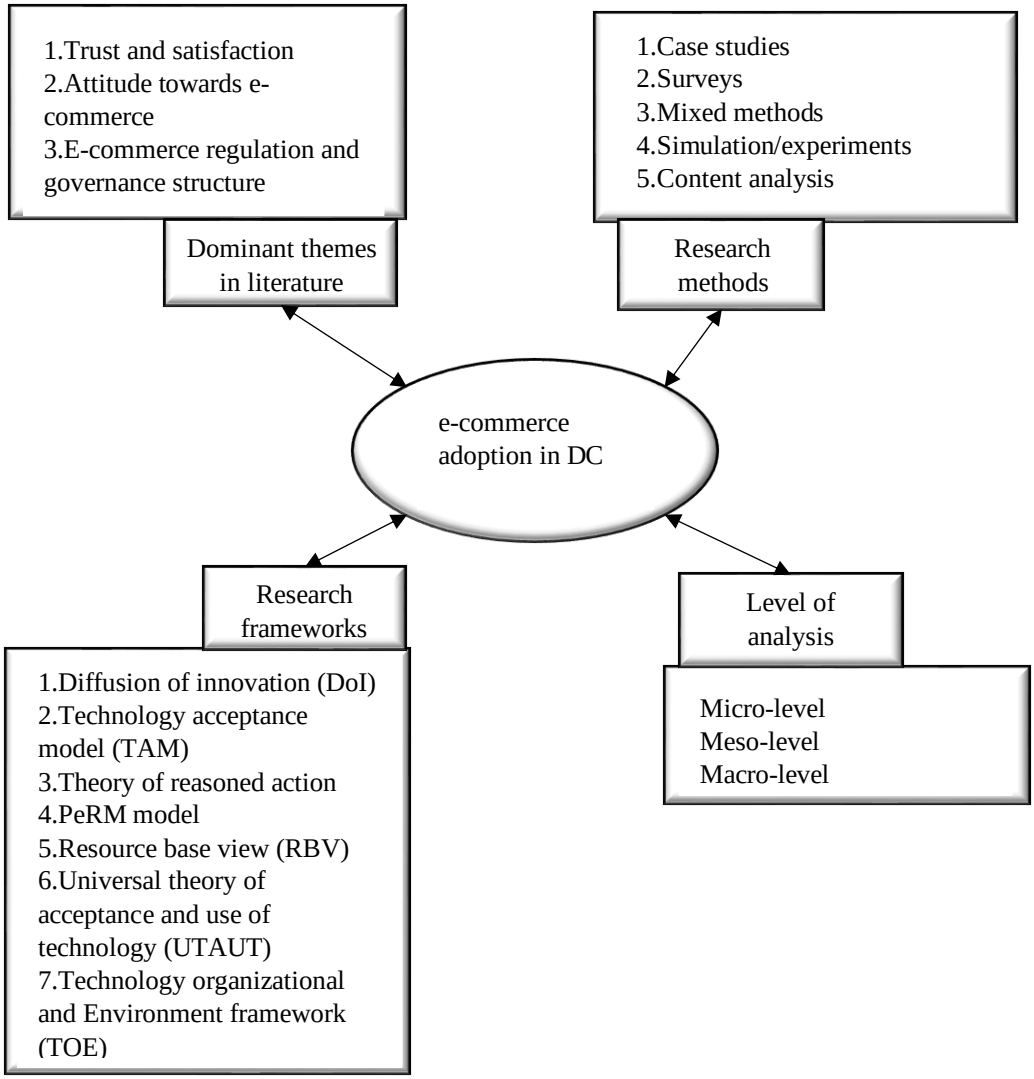
Level of analysis	Number of articles	Selected references
Micro-level studies	16	Fang et al. (2014); Hinz et al. (2011); Garbarino & Maxwell (2010); Yang (2011); Sullivan & Kim (2018); Hallikainen & Laukkanen (2018)
Meso-level studies	28	Ramanathan (2010); Lee & Koubek (2010); Huang et al. (2010); Zhang et al. (2011); Choshin & Ghaffari (2017); Liu et al. (2013); Kabanda & Brown (2017); Awiagah et al. (2015)

Macro-level studies	39	Almousa (2013); Kurnia et al. (2015); Eid (2011); Rahayu & Day (2015); Ueasangkomsate (2015); Alyoubi (2015); Zhu et al. (2019); Kwak et al. (2019), Alsaad & Taamneh (2019)

Source: Author's construction

A summary of the classification of articles is presented in figure 2.4

Figure 2.4 Articles classification framework



Source: Author's construct

2.7 Trends on the internet and e-commerce in Ghana

According to the National Population Council (NPC) of Ghana, as of December 2018, Ghana's population was approximately 30 million. The internet world statistics provided by ITU (2018) reported that Ghana has 39 per cent of its population as internet users. The ICT for accelerated development initiative, abbreviated as ICT4AD, was introduced in Ghana in 2008 to educate Ghanaians on e-transactions and increase their readiness for e-transactions. Moreover, provide a platform to safeguard the development of the ICT industry and to facilitate e-commerce. The objective behind ICT4AD was to bridge the digital divide between Ghana and her developed country trading partners. However, according to the UN Conference on Trade and Development (UNCTAD), Ghana has 39% internet users. Furthermore, 2% of internet users are engaged in online shopping. These statistics mean that relatively 234,000 Ghanaians are engaged in online purchases. This percentage of probable online shoppers in Ghana is woefully below those of other developed countries in Europe and America reported by UNCTAD to have over seventy-five per cent of their population as online shoppers. This situation means that internet users in Ghana mostly use the internet for social purposes rather than online purchases. Despite the low turnout of e-commerce users in Ghana, it has some e-commerce platforms for e-commerce transactions. Examples of these e-commerce websites are; eShopAfrica.com, Tonaton.com, Jumia, OLX, Baahe.com, Tisu.com, Zoobashop.com, and Souq Afrique. These websites are shown in Appendix B.

2.8 Synthesis of related articles on online security, trust, and website quality

2.8.1 Online Security

The internet has transcended from communication with families and friends to a tool for buying and selling, creating value in our daily lives. However, despite the pros that accompany online purchases, it has its disadvantages. One major problem that inhibits people from engaging in an online purchase is security (Ariffin et al., 2018; Taherdoost, 2017; van Bavel et al., 2018). According to Strzelecki and Rizun (2020), consumers perceive online security when they know that their personal information is safe and not be assessed by third parties. Furthermore, Arora and Muttoo (2018) found that consumers' perception of online security positively influences their online purchases. This implies that consumers' involvement in e-commerce increases when their perception of security increases. Consumers are becoming increasingly aware of online security threats. A survey by Kamaladeri and Vanithamani (2016) unearthed that 15% of sampled consumers have trust issues with online shopping. In a business-to-consumer digital environment, such as an e-commerce platform, McCole et al. (2010) opined that online purchase security significantly influences consumers' acceptance of transaction risk. This finding is consistent with Kim et al. (2010), who found that the security of electronic payment systems is a significant determiner of consumers' choice of online purchases. Other studies such as Meskaran et al. (2013) and Zhang et al. (2012) have shown that consumers' perception of risk negatively impacts their propensity to shop online. Prior research has shown that perceived security of e-commerce systems plays a more critical role than perceived usefulness and ease of using the systems (Taherdoost et al., 2014). There is a strong correlation between the perceived security of websites and the rate of consumers' involvement with online shopping through websites (Mohd and Zaaba, 2019). As many consumers use e-commerce systems, they share personal information and violate privacy (Garg and Camp, 2015) and security (Benson et al., 2015).

Consequently, it is vital to study and investigate the impact of online security on e-commerce adoption, especially in emerging economies, where adoption is relatively low. Schneier (2015) identified three dimensions of online security: confidentiality, integrity, and availability. Online security is considered necessary but has received imbalanced and insufficient scholarly attention in developing countries. In this research, the impact of online security on the actual use of e-commerce systems in a developing country is assessed.

2.8.2. Online trust

Online trust has gained a considerable amount of attention in the e-commerce literature. As a result, extant studies have investigated the influence of online trust on consumer behaviour (Punyatoya, 2018; Chiu et al., 2017; Ji et al., 2019; Tam et al., 2019). However, according to Punyatoya (2018), previous studies on online trust have been predominantly conceptualized as a single dimension, limiting our knowledge of the various types of trust and how consumers build them over time. Morrow et al. (2004) suggested that cognitive and affective trust forms general trust. Punyatoya (2018) conceptualized these two dimensions of trust as determining factors of online consumer satisfaction. Lewis and Weigert (1985) viewed cognitive trust as a more reflective, controlled, slow, and deliberate analytical thinking process that influences behaviour. In an e-commerce environment, we can conclude that cognitive trust in an e-commerce system is when consumers carefully apply logic and analytical thinking about which e-vendors they will trust based on their beliefs. This dimension of trust is similar to system 2 of the dual-system theory (Kahneman, 2011).

Contrary to cognitive trust, affective trust is based on emotions (emotional bonds between parties) rather than a systematic and thought process (Morrow et al., 2004). This dimension of trust complements system 1 of the dual-system theory (Kahneman, 2011). Punyatoya (2018) found that both dimensions of trust (cognitive and trust) positively and significantly influence consumers' online satisfaction.

It cannot be overemphasized that building trust, especially in virtual markets, is very important for its success. Juxtaposed with the traditional brick-and-mortar stores, it seems relatively difficult for e-vendors/e-retailers to build trust with customers (Lu et al., 2016). Ji et al. (2019) discovered that businesses use social commerce online and offline to surmount the trust issues that plague e-commerce businesses. This is in line with the growing corpus of literature addressing the importance of social commerce's impact on e-commerce trust (Cheng et al., 2019). They also revealed that building trust with consumers must involve creating offline contact with current and potential customers.

Tam et al. (2019) integrated trust as an additional variable into the DeLone and McLean information systems success model to investigate trust's impact on system use and user satisfaction. Their findings suggest that trust in e-commerce systems positively and significantly influence systems use and user satisfaction. The research also revealed competence, integrity, and benevolence as vital determinants of trust in e-commerce.

Likewise, Wei et al. (2018) found a significant association between trust and transaction intention in customer-to-customer e-marketplaces. These findings are consistent with Mittendorf (2018), who indicated that trust significantly influences consumers' intention to use online platforms.

Uncertainties in online transactions, caused mainly by the lack of control of the process, especially in the e-market environment, results in trust issues between sellers and buyers (Martin et al., 2015). As a result, the seller-based mechanism (SBM), the experienced-based mechanism (EBM), and the institution-based mechanism (IBM) have been identified as the dominant trust-building mechanism that influences online customers' behaviour (Liu and Tang, 2018). According to Chen et al. (2017), SBM makes it easier for customers to grasp what e-sellers say and reduce uncertainty about product offerings. This mechanism is e-seller-centred. EBM reduces customer uncertainty and creates trust by providing feedback, ratings, reviews, and reputations through which incumbent customers share their shopping experience, which can influence potential customers' e-shopping intention (Johnston et al., 2016). This mechanism is consumer-centred. The IBM involves a third-party institution ensuring transaction security and provides independent verification of a retailer's quality (Ho and Bodoff, 2014). Liu and Tang (2018) revealed that the perceived usefulness of SBM positively influences trust in e-marketplace and e-sellers. The perceived usefulness of IBM has a positive impact on trust in an e-marketplace, and the perceived usefulness of EBM has a positive effect on trust in e-sellers. These findings have implications for e-vendors who want to increase the perception of their consumers' trust.

2.8.3 Website quality

As many brick-and-mortar businesses transform into click businesses, business websites have become vital for effective communication with incumbent and potential consumers. Consequently, the effect of website quality on users' behaviour and satisfaction in e-markets have gained considerable attention in the e-commerce literature (Nia and Shokouhyar, 2020; Sharma and Aggarwal, 2019; Lee et al., 2019; Jimenez-Barreto and Campo-Martinez, 2018). Moreover, an E-commerce website serves as the medium through which online consumers interact with e-sellers. Therefore, the absence of physical interaction between the parties involved makes an e-commerce website a tool that cannot be overemphasized. As a result, consumers can quickly obtain information about a company and its offerings, read customers' reviews and ratings, and compare prices via e-commerce sites. In order to enjoy high traffic on e-businesses websites, it must be appealing to consumers to stick around

longer. This result can be achieved when the website is of the highest quality. According to Sharma and Aggarwal (2019), website quality can be judged on the contentment generated by consumers when surfing the website. This aligns with Abdallah and Jaleel (2015), who concluded that a website is considered quality when consumers derive the satisfaction they desire when surfing. Factors such as ease of use, website responsiveness, visual aesthetics, and information quality have been suggested as determinants of website quality (Jimenez-Barreto and Campo-Martinez, 2018). Garcia-Madariago et al. (2018) opined that website quality might influence consumers' loyalty to e-vendors, eventually building trust. Pallud and Struab (2014) developed a framework that can assess the quality of a website; visual appeal, information fit-to-task, emotion, promotion, ease of understanding, and content. These six dimensions are closely related to the information, service, and system quality that defines the success of an information system (Chen et al., 2017). A good and quality website attracts and engages consumers, resulting in higher sales (Hsu, 2012).

2.9 Summary

This chapter began with the meta-analysis of e-commerce articles with a focus on developing countries. In all, 151 articles were retrieved for the analysis. The articles were classified according to their research themes, methodologies, frameworks, and levels of analysis. In the themes, the review reported that trust and satisfaction, attitude to e-commerce and e-commerce regulation, and governance are dominant issues in the e-commerce literature during the period under review. The methodological approaches review revealed that the case study is the dominant method used to investigate e-commerce adoption in developing countries.

Furthermore, the review of research frameworks showed that the universal theory of acceptance and use of technology (UTAUT) and the DeLone and McLean IS success model is the less applied frameworks used to investigate e-commerce adoption in developing countries. On the distribution of articles based on their analysis level, there is a call for more micro-level studies, thus studying e-commerce in DCs at the individual level. In addition, the analysis indicated that more studies at the consumers' level (micro-level) are needed to understand consumers' behaviour towards e-commerce adoption in developing countries.

Table 2.6 Summary table

Data sources and article selection	**Article categorization and classification**	**Research themes**	**Methodological approaches**
Databases from which journals and articles were selected: • Science direct • Jstor • Ebscohost • Emerald The total number of selected articles: • 151 articles	Articles were classified by: • Year of publication • Countries investigated • Research themes • Methodological approaches • Theoretical frameworks • Level of analysis	Trust and satisfaction were the dominant themes in the selected literature, followed by attitude towards e-commerce and e-commerce regulations and governance.	The case study is the dominant method researchers apply to investigate e-commerce adoption in developing countries (DC), followed by surveys, content analysis, mixed methods, and simulation studies.
Theoretical frameworks	**Level of analysis**		
Technology Organization and Environment is the dominantly used theoretical framework adapted to study trust and satisfaction issues in DC, while the theory of organizational trust is the least applied model. The Technology Acceptance Model (TAM) has been used widely to investigate attitudes towards e-commerce adoption. For studies on e-commerce regulations and governance, the transaction cost theory is mainly used.	Most studies on e-commerce adoption in DC provided a macro-level perspective to adoption. Followed by meso-level. Micro-level is the least has the least articles.		

CHAPTER THREE

3. RESEARCH FRAMEWORK

3.1 Introduction

Several Information Systems (IS) theories, as shown in Table 2.4, have been adopted to investigate factors that influence technology adoption. This study proposed a conceptual model based on the UTAUT to enhance our understanding of Ghana's e-commerce adoption. The UTAUT model was proposed by Venkatesh et al. (2003), and it is one of the technology adoption theories that has helped understand and predict consumer acceptance or rejection of new technology. The model has four primary constructs, namely- performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). These constructs are hypothesized to influence behavioural intention (BI) and subsequently, user behaviour. Studies that have used the UTAUT model to explain and predict factors that influence consumers' online purchase intention include; Dewi et al. (2020), Sobti (2019), Jewer (2018), Al-Saedi et al. (2020), Baishya and Samalia (2020), Escobar-Rodriguez and Carvajal-Trujillo (2014), Yeganeji and Elias (2016). However, to increase our understanding of technology adoption in consumers' context, it is vital to include and test additional potent variables from the consumer side. For this reason, this study adopts the UTAUT model and enriches it by introducing two external constructs, namely, familiarity with an online vendor and website quality. Second, the conceptualized model also tested the moderating effect of trust and online security on the relationship between behavioural intention and use behaviour.

Several models have been proposed following the heap criticisms on the technology acceptance model (TAM), with the UTAUT being one of the most popular models. The UTAUT model, as proposed by Venkatesh et al. (2003), has four exogenous variables: performance expectancy, effort expectancy, social influence, facilitating conditions, and two endogenous variables, thus, behavioural intention and user behaviour. The constructs of the classical UTAUT were extracted after carefully conceptualizing and validating eight technology acceptance models, i.e., Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivation Model (MM), Theory of Planned Behavior (TPB), Combined TAM, and TPB (C-TAM-TPB), Model of PC Utilization (MPCU), Social Cognitive Theory (SCT), and Innovation Diffusion Theory (IDT).

3.2 An empirical comparison of the eight models

Venkatesh et al. (2003) adopted a longitudinal study to compare the eight models empirically. The participants were individuals from four organizations who were introduced to new technology in the workplace. Participants were sampled across industries. The longitudinal study made it possible to observe the behaviour of the respondents over time. Data collection in each organization coincided with training associated with the introduction of new technology. Pretested questionnaire, which contained items measuring the factors from all eight models at three different points in time, i.e., post-training, one month after implementation, and three months after implementation was administered. Actual usage behaviour was measured during the six-month post-training period. The findings showed that performance expectancy, effort expectancy, social influence, and facilitating conditions are significant and direct antecedents of behavioural intention and use behaviour. This model was named the Unified Theory of Acceptance and Use of Technology (UTAUT).

Before the proposal of the UTUAT model, information systems researchers have applied many competing frameworks to investigate different types of technology acceptance. These include; theory of reasoned action (TRA), technology acceptance model (TAM), motivation model (MM), theory of planned behaviour (TPB), combined TAM & TPB (C-TAM-TPB), model of PC utilization (MPCU), innovation diffusion theory (IDT), social cognitive theory (SCT). Each with a distinctive set of factors that may influence technology adoption. Venkatesh et al. (2003) reviewed these models to suggest a unified view of user acceptance of technology. They examined both the similarities and differences of these models compared to studies that only observed the similarities. Juxtaposed with the streams of research that concentrated on organizational implementation success (Leonard-Barton and Deschamp, 1988) and task-technology fit (Goodhue, 1995) as dependent variables, Venkatesh et al. (2003) concentrated on the intention on usage as a dependent variable. Their objective was to provide a holistic view of users' actual technology usage or system usage as a criterion variable. The data analysis revealed that seven variables of the eight models significantly affect intention on usage. Venkatesh et al. (2003) theorized that four out of the seven variables would have a significant role as direct determinants of user acceptance and use behaviour. They provided names for these variables; the first of which is performance expectancy which has its root from perceived usefulness (Davies, 1989), extrinsic motivation (Davies et al., 1992), job-fit (Thompson et al., 1991), relative advantage (Moore and

Benbasat, 1991), and outcome expectations (Compeau et al., 1999). The second variable is effort expectancy which has its root from perceived ease of use (Davis, 1989), complexity (Thompson et al., 1991), ease of use (Moore and Benbasat, 1991). The third variable is the social influence which emerged from the subjective norm (Ajzen, 199), social factors (Thompson et al., 1991), and image (Moore and Benbasat, 1991). The fourth variable is facilitating conditions that emerged from perceived behavioural control (Ajzen, 1991) and compatibility (Moore and Benbasat, 1991). After these four essential variables were extracted to propose the unified theory of acceptance and use of technology, they were tested empirically with six organizations. The findings confirmed that performance expectancy, effort expectancy, social influence are direct predictors of intention, and facilitating conditions and intention are direct determinants of usage.

3.3 What did Venkatesh et al. (2003) do differently?

Venkatesh et al. (2003) addressed three limitations identified in prior research that have attempted to report an empirically based comparison of two or more of the eight models published in major IS journals. These are;

1) **Participants**: Most participants in prior studies that sought to test the constructs of one or more of the eight models have been students. Plouffe et al. (2001) was arguably the only study that used respondents from a non-academic setting. As a result, Venkatesh et al. (2003) collected data from employees in an organization; the first research on individual technology acceptance was conducted with employees from four different organizations.

2) **Time of measurement**: Before Venkatesh et al. (2003), most studies on technology adoption were conducted after participants have either accepted or rejected the technology. Studies conducted during the active adoption process are arguable absent (Fiske & Taylor, 1991; Venkatesh et al., 2000). Based on this limitation, Venkatesh et al. (2003) examined technology adoption from the initial introduction to the decision on its adoption.
3) **Voluntary and mandatory contexts**: Most studies that tested technology acceptance models were conducted in a voluntary use context. As a result, the findings could not be directly implied in the mandatory use context. Venkatesh et al. (2003) incorporated mandatory and voluntary contexts to test the eight models'

factors. The mandatory use context refers to the organizational environment that requires employees to use a system/ technology compulsorily. These contexts selected were the banking industry and public administration. In the banking industry, analysts were obliged to apply portfolio analyzers to access existing and new accounts. Accountants were mandated to use proprietary accounting programs for organizational bookkeeping in public administration.

On the other hand, the voluntary use context optionalizes a system or technology use. Venkatesh et al. (2003) sampled employees from the entertainment and telecommunication industry. Employees of the sampled entertainment firms could use online meeting managers in place of traditional phone conferences. Employees from the telecommunication services were allowed to use database applications to access products and industry standards rather than technical manuals.

3.4 Descriptive presentation of the eight model

3.4.1 Theory of Reasoned Action (TRA)

TRA is one of the fundamental theories that predict human behaviour. Proposed by Fishbein and Ajzen (1975), TRA has been applied to understand and predict human behaviour in various contexts. Its core constructs are; attitude towards behaviour, which is defined as "an individual's positive or negative feelings about performing the target behaviour" (Fishbein and Ajzen 1975, p. 216); and subjective norms - a person's perception that most people who are important to him think he should or should not perform the behaviour in question" (Fishbein and Ajzen 1975, p. 302).

3.4.2 Technology Acceptance Model (TAM)

TAM was proposed by Davis (1989) to predict individual technology acceptance or rejection. TAM is mainly tailored to the information systems (IS) context. Variables in this model include; perceived usefulness – "the degree to which an individual believes that using a particular system would enhance his job performance" (Davis 1989, p.320); perceived ease of use - "the degree to which an individual believes that using a particular system would be free from effort" (Davis 1989, p.320); and subjective norm which was adapted from TRA.

3.4.3 Motivation Model (MM)

MM has been supported as a theory that provides an understanding of human behaviour. For example, Davies et al. (1992) used MM theory to explain the adoption of new technology. Extrinsic and intrinsic motivation are the factors of the motivation model. Extrinsic motivation is defined as "users' perception of performing an activity because they value it to be instrumental in achieving valued outcomes, such as improved job performance, pay, or promotions" (Davis et al. 1992, p., 1112). On the other hand, intrinsic motivation is defined as "the perception that users will want to perform an activity for no apparent reinforcement other than the process of performing the activity per se" (Davis et al. 1992, p. 1112).

3.4.4 Theory of Planned Behaviour (TPB)

TPB was proposed by Ajzen (1991) as an extension of TRA by introducing perceived behavioural control. Ajzen (1991, p.188) defined perceived behavioural control as " the perceived ease or difficulty of performing the behaviour". Attitude and subjective norms were adapted from TRA.

3.4.5 Combined TAM and TPB (C-TAM-TPB)

This model integrates TPB factors with TAM's perceived usefulness to suggest an integrated model (Taylor & Todd, 1995a). Factors of this combined model consist of attitude (adapted from TRA/TPB), subjective norms (adapted from TRA/TPB), perceived behavioural control (adapted from TRA/TPB), and perceived usefulness (adapted from TAM).

3.4.6 Model of PC Utilisation (MPCU)

MPCU was used by Thompson et al. (1991) to predict PC utilisation. The nature of the model makes it suitable to understand and predict technology acceptance. Factors of this model include; job fit, which is defined as "the extent to which an individual believes that using (a technology) can enhance the performance of his or her job" (Thompson et al., 1991, p. 129); complexity, defined as "the degree to which an innovation is perceived as relatively difficult to understand and use" (Thompson et al., 1991, p. 128); long term, defined as "Outcomes that have a pay-off in the future" (Thompson et al., 1991, p. 129); affect towards use – "feelings of joy, elations, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act" (Thompson et al., 1991, p. 127); social factors – "the

individual's internalisation of the reference group's subjective culture, and specific interpersonal agreement that the individual has made within others, in specific social situations" (Thompson et al., 1991, p. 126); facilitating conditions – "These are factors that make it easy to accomplish a task. For example, online purchase is facilitated when 24hour support is available to consumers who encounter some difficulties when using the e-commerce platform. "provision of support to users of PCs may be one type of facilitating condition that can influence system utilisation" (Thompson et al., 1991, p. 129).

3.4.7 Social cognitive theory (SCT)

SCT was proposed by Bandura (1986), and it was used by Venkatesh et al. (2003) to understand individual technology acceptance. Outcome expectation performance, self-efficacy, affect, and anxiety are the constructs of SCT. Outcome expectation performance measures performance on expected job outcome (Compeau & Higgins, 1995b). Self-efficacy measures the judgment of one's ability to use a technology (e.g., computer) to accomplish a particular job or task. Affect measures an individual's emotional attachment to a particular behaviour (e.g., using an app). Anxiety measures evoking anxious or emotional reactions when performing a behaviour (e.g., using an app).

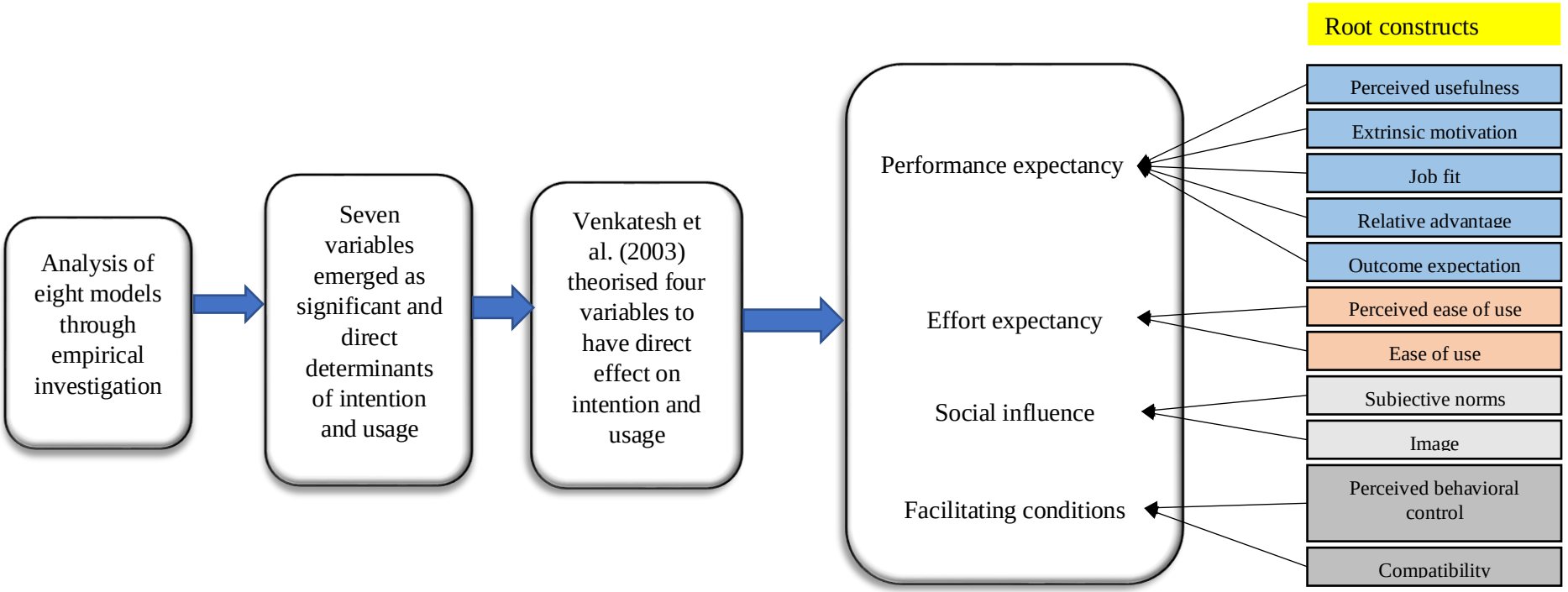
3.4.8 Innovation Diffusion Theory (IDT)

Variables of IDT include relative advantage, ease of use, image, visibility, compatibility, results demonstration, the voluntariness of use. According to Moore & Benbasat, 1991, p.195, relative advantage is "the degree to which an innovation is perceived as better than its precursors." Moore & Benbasat (1991) defined ease of use as "the degree to which an innovation is perceived as easy to use." Image is perceived as "the degree to which the use of an innovation is perceived to enhance one's image or status in one's social system" (Moore & Benbasat, 1991, p. 195). Visibility is defined as "the degree to which one can see others using the system in the organisation" (Moore & Benbasat, 1991). More so, the compatibility variable is theorized as "the degree to which an innovation is perceived as being consistent with the existing values, needs, and experience of potential adopters" (Moore & Benbasat, 1991, p. 195). The result demonstration variable is "the tangibility of the results of using the innovation, including their observability and communicability" (Moore & Benbasat, 1991, p. 203). Lastly, the voluntariness of use is "the degree to which

the use of the innovation is perceived as being voluntary, or of free will" (Moore & Benbasat, 1991, p. 195).

Table 3.1 (in Appendix C) shows the eight models of individual technology acceptance, out of which Venkatesh et al. (2003) extracted the four antecedents of intention to use. Figure 3.1 overleaf shows the evolutionary path to the UTAUT variables.

Figure 3.1 The evolutionary path to UTAUT variables by Venkatesh et al. (2003)



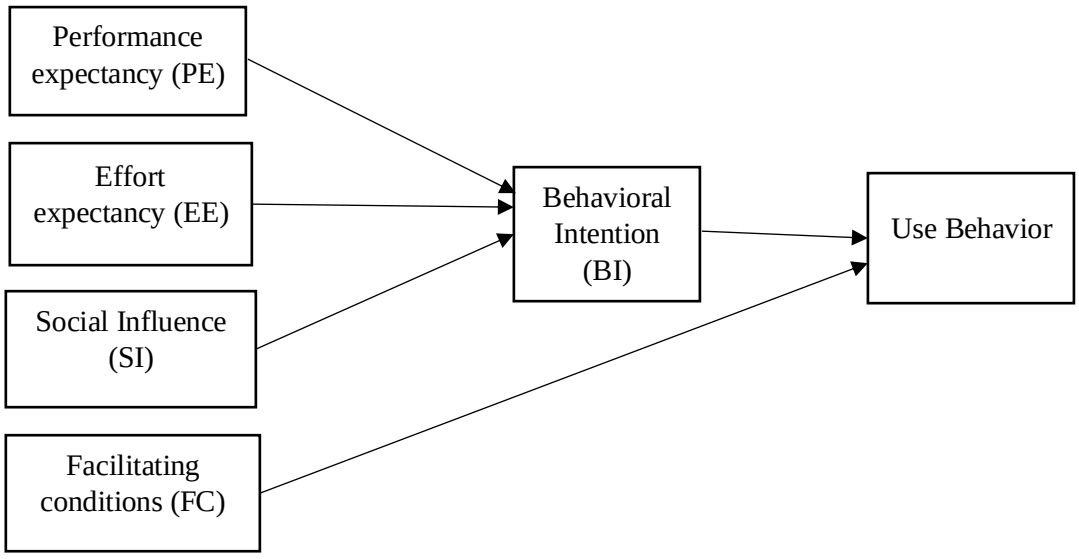
Source: Author's construction

3.5 The Unified Theory of Acceptance and Use of Technology (UTAUT)

The unified theory of acceptance and use of technology states that performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC) are influence behavioural intention and use behaviour (Venkatesh et al., 2003). The actual application and validation of its constructs have made it a theoretically and practically grounded theory in information systems. The UTAUT has been applied and validated in many contexts after its acceptance as a model for predicting users' behavioural intention and information systems/technology use (see Alsaedi et al., 2020; Sultana et al., 2020; Venkatesh et al., 2012; Soni et al.,2019; Tarhini et al., 2019). Venkatesh et al. (2003) suggested that performance expectancy measures the utilitarian aspect of using a system. Effort expectancy was suggested to measure the physical and mental ease associated with using a system. Social influence was suggested to measure the effect of significant others (family, friends, and social media) on users' intention to use a system. Facilitating conditions measure the effect of proximity to assistance and support for using a system. Venkatesh et al. (2003) theorized that performance expectancy, effort expectancy, and social influence directly influence behavioural intention. At the same time, behavioural intention and facilitating conditions directly influence the users' actual behaviour.

Figure 3.2 shows the original UTAUT model.

Figure 3.2 The UTAUT model



Source: Venkatesh et al. (2003)

3.6 Why extend the original UTAUT model?

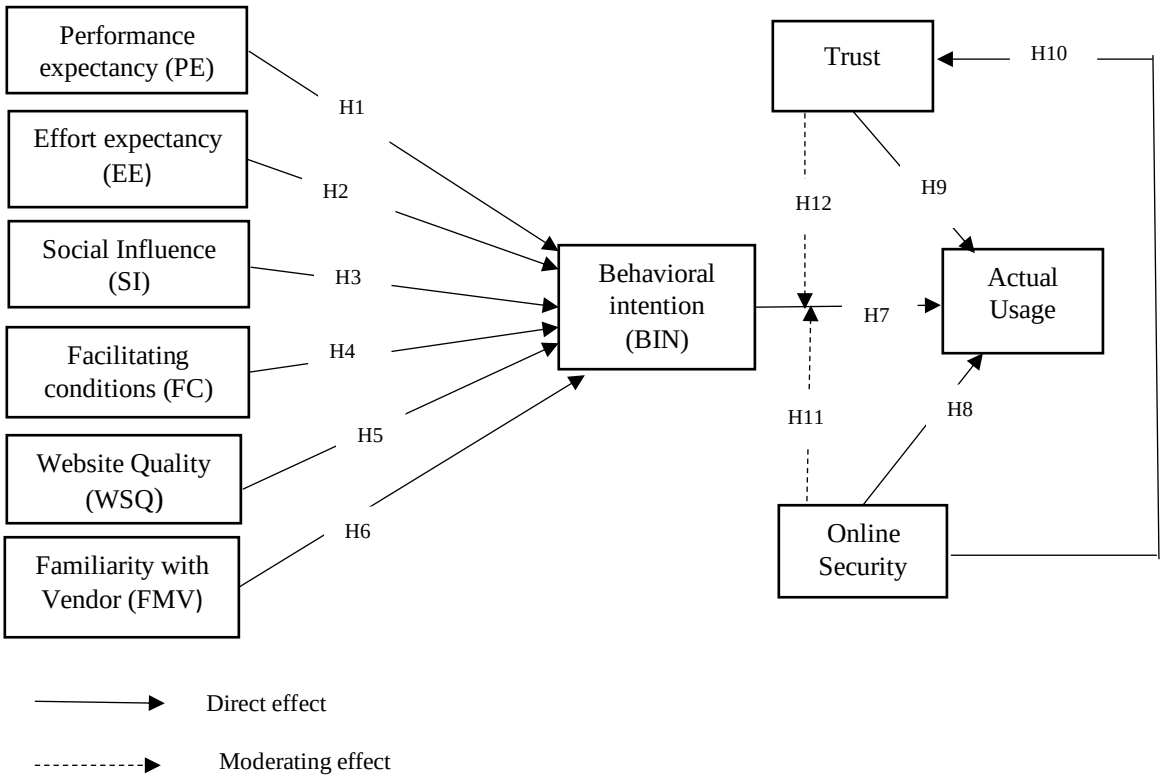
Technological innovations are rapidly changing, and the future of technology adoption models lies in enriching the existing models with more current constructs and concepts. Extant studies have used the UTAUT model to understand the antecedents of technology adoption in various contexts such as mobile commerce (Tarhini et al., 2019; Sobti, 2019; Verkijika, 2018), online purchase intention (Dewi et al., 2020), e-banking (Anouze and Alamro, 2020; Rahi et al., 2019). Dewi et al. (2020) integrated the role of anxiety and personal innovativeness with the UTAUT model and tested their online purchasing effect. All the factors proved positive and significant, except anxiety that showed a negative but significant relationship with online purchase intention. Sobti (2019) introduced three more constructs to the UTAUT: perceived cost, perceived risk, and demonetisation, to test their association with behavioural intention to adopt mobile payment. In addition to the UTAUT factors, perceived cost, risk, and demonetisation positively influenced mobile payment. More so, Rahi et al. (2019) integrated e-service quality factors (website quality, customer service, assurance, and reliability) with UTAUT. All the factors showed a significant influence on the intention to adopt e-banking. Familiarity with online vendors has become a key determinant of e-commerce adoption in recent times as it reduces consumers' uncertainties and helps build a strong relationship with vendors. However, only a few studies, such as Lee and Kwon (2011), showed a positive impact of familiarity with e-commerce with consumer continuance intention to buy. Das (2018) confirmed that familiarity has a positive influence on purchase intention. Many studies have attributed consumers' intention to engage in online activities, primarily e-commerce, to website quality. For example, Sharma & Aggarwal (2019) confirmed that website quality significantly affects e-commerce success.

Similarly, Aakash and Aggarwal (2019) found that website quality positively and significantly influences customer satisfaction and repurchase intention. Also, Liu et al. (2017) reported a positive relationship between website quality and consumers' purchase intention. This study integrates familiarity with an online vendor and website quality with the classical constructs of the UTAUT. The inclusion of these variables is to uncover their effect on e-commerce adoption within a developing country context, focusing on Ghana. The author believes that we are conversant with people we know and are comfortable with as human beings. In this context, the author assumes that a consumer's familiarity with an online vendor means that the consumer has had a previous online transaction with the

vendor. And therefore, have the experience to use their e-commerce systems with confidence. Therefore, familiarity with an online vendor may boost consumer's confidence to make significant progress in their online purchases. The author further assumed that the quality of an e-commerce website regarding its usefulness to consumers, security, page loading speed, ease of use, and visual aesthetics could advance the number of times the site is visited, which may increase behavioural intention to purchase from it. These assumptions serve the basis for including these two variables as mentioned above into the original UTUAT model.

More so, this study tested the moderating effect of trust and online security on the relationship between behavioural intention and actual use of e-commerce. The conceptual model for this study is shown in Figure 3.3.

Figure 3.3 Conceptual model



Author's proposed model

3.6 Investigated Constructs and Hypotheses development

3.6.1 Performance expectancy (PEE)

According to Venkatesh et al. (2003, p.447), performance expectancy (PEE) is "the degree to which an individual believes that using a system will help to attain some gains in job performance". Performance expectancy measures the perceived gain or profit associated with the use of a system or technology. PEE is presented as an extrinsic motivating factor that motivates people to perform a behaviour, expecting that the behaviour will bring them some gains (Zhou et al., 2019). The higher the perceived usefulness of e-commerce services, the greater the chance of adoption (Alalwan et al., 2017; Thakur, 2013). The effect of PE on behavioural intention to adopt a system or a technology has been reported in many studies (Soni et al., 2019; Marinkovic et al., 2020; Netshirando et al., 2020; Joen et al., 2018, Tarhini et al., 2019; Raza et al., 2019; Alsaedi et al., 2020; Sultana et al., 2020; Venkatesh et al., 2011). Soni et al. (2019) confirmed PEE as a significant predictor of consumer behavioural intention to adopt fashion mobile shopping applications. Marinkovic et al. (2020) confirmed PEE as the strongest predictor of consumer satisfaction and continuance intention in mobile commerce.

Similarly, Netshirando et al. (2020) found that PEE significantly influences purchase intention and repeat purchase behaviour. Likewise, the findings of Joen et al. (2018) suggest that PEE is a positive and significant determinant of consumers' intention to book flight tickets on smartphone applications. However, some prior studies have reported contradictory findings. For example, Lian (2015), Singeh et al. (2013), Yueh et al. (2015), and Faraliza et al. (2014) found a negative and insignificant association between PEE and behavioural intention to adopt technologies. In emerging economies, many consumers prefer brick-and-mortar trading to clicks or dot.com as they perceive it to be more secure and devoid of sharing personal information with trading partners. Although e-commerce is in its initial development stage in many developing countries, many more consumers are expected to adopt it as long as it provides benefits and gains to adopters. When consumers perceive the usefulness of e-commerce, their intention to use e-commerce applications to make purchases is more likely to increase. More importantly, PEE can significantly increase the behavioural intention to adopt e-commerce. In the context of this study, performance expectancy is described as consumers' belief that e-commerce will be helpful for them to purchase the

products they need effectively. To answer research question one, i.e., What are the determining factors of e-commerce adoption in Ghana? This study hypothesized that;

H1: *Performance expectancy will significantly influence consumers' behavioural intention to adopt e-commerce in Ghana.*

3.6.2 Effort expectancy (EFE)

Effort expectancy (EFE) is defined as "the degree of ease of use associated with the use of a system" (Venkatesh et al., 2003, p. 450). Effort expectancy was adapted from the perceived ease of use (PEOU) construct in TAM. Effort expectancy measures the mental and physical freedom associated with the use of a system or technology. Effort expectancy has been proved to be a significant predictor of behaviour intention (Kim and Lee, 2020; Dewi et al., 2020; Tarhini et al., 2019; Hogue and Sowar, 2017; Aditya and Pemadi, 2018; Netshirando et al., 2020; Soni et al., 2019). Dewi et al. (2020) revealed that effort expectancy is a significant determinant of Indonesia's online purchase intention. Kim and Lee (2020) confirmed that EFE significantly affects teachers' behavioural intention to use ICT for instruction. Equally, Soni et al. (2019) suggested that EFE significantly predicts consumer behavioural intention to adopt fashion mobile shopping applications**.** These corroborate the findings of Netshirando et al. (2020) and Joen et al. (2018) that revealed EFE to be a significant determinant of behavioural intention. These findings imply that if consumers find e-commerce services easy to use, their intention to use e-commerce systems to make purchases will also increase. The lesser the effort required, the greater the behavioural intention to use it. Dwivedi et al. (2017) reported a positive but weak relationship between effort expectancy and behavioural intention. Conversely, Lawson-Body et al. (2018 reported an insignificant association between EFE and students' acceptance of e-books. Also, Mensah (2019) found an insignificant relationship between EFE and e-governance service adoption. The conflicting results of EFE's effect on behavioural intention call for researchers to further investigate the relationship EFE has with behavioural intention. In the context of this study, effort expectancy refers to consumers' perceived ease of use associated with the use of e-commerce applications and e-commerce systems. In order to answer research question one of this research, this study hypothesized that;

H2: *Effort expectancy will significantly influence consumers' behavioural intention to adopt e-commerce in Ghana.*

3.6.3 Social Influence (SOCI)

Venkatesh et al. (2003, p.453) defined social influence as "the degree to which an individual perceives that important others believe he should use a new system". Adov et al. (2020) assert that others' views and opinions affect their actions, which happens in online purchasing. For example, the opinions of friends, family, social media, and hierarchical superiors may influence the perception and behaviour of consumers to adopt e-commerce. Extant studies have confirmed the relationship between social influence and the behavioural intention to adopt a new system (Zhang et al., 2020; Adov et al., 2020; Isaac et al., 2019; Sultana, 2020; Raza et al., 2019; Soni et al., 2019; Kim and Lee, 2020; Joen et al., 2018). Zhang et al. (2020) reported SI as a significant predictor of students' intention to adopt an e-learning system. Equally, Adov et al. (2020) suggest SOCI positively and significantly influences teachers' attitudes towards mobile device use in teaching. Shiferaw and Mehari (2019) reported social influence as a positive and significant predictor of behavioural intention to use electronic medical records (EMR). Equally, Al-Saedi et al. (2020) confirmed a significant positive effect of social influence on behavioural intention to use mobile payment systems. Similarly, Teo et al. (2012) indicated a positive and significant association between subjective norms and behavioural intention to adopt mobile banking. These findings align with Tan et al. (2010), who found that social influence significantly predicts behavioural intention to adopt online banking. The literature has demonstrated the significant impact of social influence on behavioural intention extensively. The literature on social influence justifies using the social influence factor in assessing consumer intention to adopt e-commerce. However, some studies have reported a non-significant relationship between SI and behavioural intention (Soni et al., 2019; Sultana, 2020; Wrycza et al., 2017; Raza et al., 2019; Tarhini et al., 2019). For this study, social influence refers to the external motivation stimulus that affects consumers' behavioural intention to adopt e-commerce. In order to answer research question one of this research, this study hypothesized that;

H3: *Social influence will positively and significantly influence consumers' behavioural intention to adopt e-commerce in Ghana.*

3.6.4 Facilitating conditions (FAC)

The facilitating condition is defined as "the degree to which an individual believes that an organization or technological infrastructure exists to support the use of a new system" (Venkatesh et al., 2003, p. 453). When consumers have a support system available to assist them anytime during the online purchase process, they will feel more confident, increasing their intention to use the e-commerce system. Facilitating conditions help minimize if not eradicate obstacles that may hinder the smooth operation of a system. If obstacles are present in an e-commerce system, behavioural intention to adopt is less likely to arise (Penarroja et al., 2019). The relationship between FAC and behavioural intention has been reported by some prior studies (Yoo and Roh, 2019; Zhou et al., 2019; Khechine et al., 2020; Patil et al., 2020; Shiferaw and Mehari, 2019; Adov et al., 2020; Zhang et al., 2020; Kim and Lee, 2020). Yoo and Roh (2019) confirmed that facilitating conditions are significantly positively associated with students' adoption of e-books. Soni et al. (2019) found FAC to significantly predict consumer behavioural intention to adopt fashion mobile shopping applications. Lawson-Body et al. (2018) reported that FAC has a significant association with students' acceptance of e-books. Zhang et al. (2020) considered FAC a significant predictor of students' adoption of the e-learning system. These results indicate that consumers engage more when facilitating conditions exist in online communities. Facilitating conditions are essential for the study of e-commerce adoption because it indicates that the presence or absence of organizational or technological support influences behavioural intention. In order to answer research question one of this research, this study hypothesized that;

H4: *Facilitating conditions will significantly influence consumers' behavioural intention to adopt e-commerce in Ghana.*

3.6.5 Website quality (WSQ)

The fierce competition between e-commerce firms has forced them to shift from the retail strategy for revenue generation to a more consumer-centric strategy. The high quality of e-commerce sites has been a necessary antecedent that positively influences consumers to purchase on the site (Javornik, 2016). The contribution of website quality to consumer intention to purchase on e-commerce sites has gained some attention in the e-commerce literature as some studies have reported the relationship between website quality and

behavioural intention to purchase (Liu et al., 2017; Sharma and Aggarwal, 2019; Akram et al., 2018; Noronha and Rao, 2017; Giao et al., 2020; Octavia and Tamerlane, 2017). Liu et al. (2017) confirmed a positive relationship between website quality and consumers' purchase intention. Similarly, Sharma and Aggarwal (2019) found that website quality positively and significantly affects e-commerce system success. Likewise, Akram et al. (2018) reported a positive and significant association between website quality and online impulse buying behaviour. Giao et al. (2020) findings also showed a positive and significant effect of website quality on electronic purchase intention. Prior studies have assessed various website quality dimensions to unravel their influence on consumer behavioural intention. For example, Shin et al. (2013) attributed site design, information usefulness, transaction security, consumer communication, and shopping convenience to website quality. Barnes and Vidgen (2006) also suggested usability, trust, empathy, design, and information as website quality dimensions.

Moreover, Hu et al. (2009) opined perceived usefulness, ease of use, security, and convenience as website quality dimensions. In their opinion, website quality is a crucial determinant of the success or failure of electronic platforms. This research measures website quality with indicator items such as; page loading speed, up-to-date information, visual appearance, understandability, and perceived ease of use. In order to answer question one of this research, this study hypothesized that;

H5: *Website quality will significantly influence consumers' behavioural intention to adopt e-commerce in Ghana.*

3.6.6 Familiarity with a vendor (FMV)

Scholars have fairly investigated the effect of consumer familiarity with the online vendor on purchase intention. Familiarity with online vendors reduces uncertainties that are usually associated with online transactions. In an e-commerce context, familiarity can be associated with understanding online processes, generally based on previous interaction and experience with online vendors via their websites. Customer familiarity with an online vendor such as Alibaba.com implies that he is well informed on looking for products, searching for the product's specifications, and knowing how to order these products from the website interface. In this context, familiarity with a vendor refers to e-commerce activity-based cognizance derived from consumers' previous experience using the e-commerce interface.

Prior studies have reported contradictory findings on the relationship between familiarity and purchase intention. For instance, the findings of Kaya et al. (2019) showed that familiarity has a significant favourable influence on consumers' desire to purchase online. This finding corroborates Azam and Aldehayyat (2018). Amir and Rizvi (2017) found familiarity to significantly influence consumers' willingness to transact online in developing countries. Contrary to these findings, Dachyar and Banjarnahor (2017) found an insignificant effect of familiarity on electronic purchase intention. This study suggests that familiarity with a vendor is a precondition of consumers' behavioural intention to adopt e-commerce; therefore, in order to answer research question one of this research, this study hypothesized that;

H6: *Familiarity with an online vendor will significantly influence consumers' behavioural intention to adopt e-commerce in Ghana.*

3.6.7 Behavioral intention (BIN)

Behavioural intention is the individual subjective probability that he would like to use a system (Fishbein and Ajzen, 1975). According to Yueh et al. (2015), behavioural intention is the probability of an individual engaging in a particular behaviour. In the context of information systems, behavioural intention indicates a person's intention to use a system (Venkatesh et al., 2012; Celik, 2016). The consumers' intention is a significant predictor of their actual behaviour. As suggested by Kim et al. (2008), behavioural intention is a psychological aspect that impacts the actual behaviour. Behavioural intention is developed after consumers have collected and compared information about the product from several e-shopping websites.

Consequently, consumers will decide according to their perception of the product (Wang and Yu, 2017). When this decision is favourable, it might result in an actual purchase from the website. Studies that have reported a relationship between behavioural intention and actual behaviour include Hossain et al. (2019), Wrycza et al. (2017), Shiferaw and Mehari (2019), Sobti (2019), and Pobee and Opoku (2018b). Sobti (2019) suggested and confirmed a positive and significant effect of behavioural intention on mobile payment services' actual use. Likewise, Wrycza et al. (2017) reported a positive and significant impact of behavioural intention on the actual use of software engineering tools in academic education. Also, Shiferaw and Mehari (2019) showed that behavioural intention significantly impacts an

electronic medical records system's actual use. This study suggested that behavioural intention will significantly predict the actual use of e-commerce, hence, hypothesized that;

H7: *Behavioral intention will significantly influence the actual use of e-commerce in Ghana.*

3.6.8 Online security

Online security has been a significant concern to consumers, especially in recent times. In the last several years, the skyrocketing rates of internet crimes have made online security an important factor in business-to-customer e-commerce. It is one of the critical concerns that inhibit consumers from adopting e-commerce. According to Salisbury et al. (2001), perceived online security is the degree to which a person believes the web is secure to transmit sensitive information. Yenisey et al. (2005) suggested that perceived online security is the extent of security that consumers discern while shopping online. Only a few studies have investigated the relationship between online security and online purchase (e.g., Gurung and Raja, 2015; Patel and Patel, 2018; Yenisey et al., 2005; Gupta and Dubey, 2016; Escobar-Rodriguez and Bonson-Fernandez, 2017). A study by Patel and Patel (2018) reported a significant positive relationship between online security and behavioural intention to use internet banking. Prior research suggests that perceived online security significantly influence online purchase (Dwivedi et al., 2017). Consumers perceived the safety of their personal and sensitive information on the website as a significant factor affecting their purchase intention (Xu et al., 2012). More so, how websites manage consumers' personal information may be a significant concern to consumers (Hong and Thong, 2013). The actual purchases from e-commerce sites would likely increase among consumers when they perceive control over the secondary use of their information. Despite the few studies investigating the impact of online security on behavioural intention, research assessing the direct relationship between online security and the actual use of e-commerce is minimal. In an e-commerce context, it would be expected that the greater the perceived security of the online transaction, the greater the probability of online purchases (Zhang et al., 2012; Slade et al., 2015). In order to answer research question two, i.e., what is the moderating effect of trust and online security on the relationship between behavioural intention and actual use of e-commerce? This study sets one sight on assessing the relationship between perceived online security and the actual use of e-commerce. This study hypothesized;

H8: *Online security will significantly influence the actual use of e-commerce in Ghana.*

3.6.9 Perceived Online Trust

Extant studies on e-commerce adoption have reported a relationship between trust and e-commerce (Hallikainen and Laukkanen, 2018; Lin et al., 2019; Abdullah and Saleh, 2019; Tarhini et al., 2019; Thompson et al., 2019; Aeron et al., 2019). Prior studies suggest that the level of risk and uncertainty associated with online purchase calls for trust especially, from the side of consumers who are generally referred to as the trustor party (Cui et al., 2020; Sakar et al., 2020; Xiao et al., 2019; Gurung and Raja, 2015). It is important to understand consumers' trust as it has become one of the significant concerns in technology adoption research (Choi, 2017; Pandey and Chawla, 2019; Liu and Li, 2019). Gefen et al. (2003, p. 161) define trust as "individual willingness to depend on a belief based on ability, benevolence, and integrity". E-commerce activities involve financial transactions that consumers perceive to be risky due to the absence of physical human interaction in performing these activities (Chantzaras et al., 2017; Heinze et al., 2017; Omonado and Bocij, 2017). More so, they have restricted means to access how online companies use their personal information. Therefore, to ensure consumers' continued use of e-commerce platforms, online companies must win consumers' trust to alleviate consumers' concerns about online transactions. Prior studies have confirmed a positive and significant relationship between trust and behavioural intention to use e-commerce (Tarhini et al., 2019; Cui et al., 2020; Sakar et al., 2020). A study by Oliveira et al. (2017) also reported a positive and significant association of trust with online purchase intention. The findings of these researches align with Sullivan and Kim (2018), who suggested that online trust is a major determining factor of an online re-purchase intention. When consumers have less trust in e-commerce websites, they become adamant about using the website to make purchases. Although prior researches have studied the impact of trust on purchase intention, research assessing the direct relationship between online trust and the actual use of e-commerce is scant and needs more empirical investigation. Stouthuysen (2020) suggested that actual purchase decisions are made when consumers trust e-commerce sites. Bhattacherjee (2002) also indicated that trust to be an antecedent of actual behaviour. This study conceptualizes that a high perception of online trust would significantly affect actual online purchases. Again, to answer research question two, i.e., what is the moderating effect of trust and online security on the relationship between behavioural intention and actual use of e-commerce? This study assessed the relationship between perceived online trust and the actual use of e-commerce. This study hypothesized;

H9: *Online Trust will significantly influence the actual use of e-commerce in Ghana.*

Also, to provide an answer for the research question three, this study seeks to investigate the relationship between online security and perceived trust and therefore hypothesized that;

H10: *Online security will significantly influence trust in e-commerce in Ghana.*

3.6.10 Moderating effects

Furthermore, the study investigates the moderating effect of trust and online security on the relationship between behavioural intention and the actual use of e-commerce applications. The aim is to assess whether online trust and security strengthen or alter the association between behavioural intention and actual use of e-commerce systems. Information systems models such as UTAUT2 (Venkatesh et al., 2012) and TAM (Davis, 1989) and the theory of planned behaviour (Ajzen 1991) have suggested a relationship between behavioural intention and actual use of system/technology. This relationship has been examined and validated in extant information systems research (Celik, 2016; Hossain et al., 2019; Wrycza et al., 2017; Shiferaw and Mehari, 2019; Sobti, 2019; and Pobee and Opoku, 2018b). Similarly, the direct relationship between online security and actual use has been investigated in a few prior research (Patel and Patel, 2018; Gupta and Dubey, 2016; Escobar-Rodriguez and Bonson-Fernandez, 2017). Equally, Stouthuysen (2020) examined the direct relationship between online trust and actual use. In order to answer question two of this research, the conceptual model assesses whether moderation occurs, as these moderating variables would provide additional insight into what the already-existing relationship looks like. Hence, hypothesized that;

H11: *Online security significantly moderates the relationship between behavioural intention and actual use of e-commerce.*

H12: *Online trust significantly moderates the relationship between behavioural intention and actual use of e-commerce.*

3.7 Summary

This chapter explained the conceptual model that was proposed to understand the antecedents of e-commerce adoption. The proposed model extended the classical UTAUT model by enriching it with two external variables, i.e., website quality and familiarity with an online vendor. The model was also used to investigate the moderating effect of perceived trust and online security on the relationship between behavioural intention and actual use of e-commerce applications. Finally, twelve hypotheses were suggested to assess the relationship between the latent variables and the criterion variable.

CHAPTER FOUR

4. RESEARCH METHODOLOGY

4.1 Introduction

This chapter explained the scientific method and approach used to collect data to answer the research questions. First, the author stated and explained his research paradigm, a set of philosophical assumptions that govern how a researcher must conduct his research (techniques and methods of data collection and analysis) based on his perceived worldview. Second, the author explained the research method he adopted; thus, the data collection survey technique. The third was the explanation of the survey design and selection of survey participants. The fourth was an explanation of the mode of analysis.

4.2 Research paradigm and philosophical assumptions

Guba & Lincoln (1994) described the research paradigm as the entire belief system or worldviews that guide the investigator in methods and ontological and epistemologically fundamental ways. Kuhn (1970) also described a paradigm as a set of beliefs, values, and techniques which is shared by members of a scientific community and which acts as a guide or map, dictating the kind of problems scientists or researchers should address and the type of explanation that are acceptable to them. Sarantakos (1998) described research methodology as a model that entails theoretical principles and frameworks that provide guidelines about how research is done in the context of a particular paradigm. In a nutshell, a research paradigm is a set of principles, worldviews, belief systems, and techniques that guide scientists and investigators of a scientific community on approaching and solving research problems. Taxonomies have been used to distinguish between paradigms (Kankam, 2019; Creswell, 1994; Schnelker, 2006). The taxonomies form the basics of the philosophical assumptions of the research paradigms. These taxonomies are; ontology assumption, epistemology assumption, and methodology assumption. These assumptions provide answers to the following;

- Ontological assumption – what is the form and nature of reality, and what can we know about it?
- Epistemological assumption – what is the relationship between the would-be knower and what can be known. In order words, it refers to the nature of knowledge and what can count as knowledge.

- Methodological assumption – how can the enquirer (researcher) find out whatever he believes can be known.

The taxonomies mentioned above differentiate between the research paradigms. The significant paradigms in social sciences research are; positivism, interpretive/constructivism, and critical realism (Smith, 2006; Kim, 2003; Myer & Avison, 2002). The author of this study ascribes to the positivist paradigm.

4.2.1 Positivism as a research methodology

As early as the nineteenth century, the idea of positivism as a philosophical paradigm emerged when Auguste Comte criticized and rejected metaphysics as a method of obtaining knowledge. Comte's view came to form the foundation of positivists' scientific approach. Positivism was recognized as the leading scientific approach to attaining knowledge at the beginning of the twentieth century by the Vienna Circle members with Karl Menger (Aliyu et al., 2014). Kankam (2019) describes positivism as a self-governing, independent, and objective existence of truth. According to Aliyu et al. (2014), the positivist paradigm was suggested based on the principle that reality and truth are independent and free from the researcher. This assertion means that researchers' personal and subjective sentiments do not influence the judgment of the truth. Thus, the acquisition of knowledge is not value-laden, and it is devoid of biases. McGregor and Murnane (2010) opined that the only way people regard knowledge as accurate is when the knowledge is created using a scientific method independent of the inquirer.

Aliyu et al. (2014) confirmed that a positivist has an idea or notion that the universe or world conforms to permanent and unchanging laws and rules of causation and happenings and that there are an intricacy and complexity that could be overcome by reductionism; and to assert an essential emphasis on impartiality, measurement, objectivity, and repeatability. Babbie (2014) highlighted that scientific truth could be positively verified through empirical observation and the logical analysis of what was observed. This assertion is consistent with Sale and Brazil (2014), who confirmed that all phenomena could be reduced to empirical indicators representing the truth. The summary of positivism and its philosophical assumptions are shown in Table 4.1.

Table 4.1 The positivist paradigm and related philosophical assumptions

Paradigm	Positivist view
Ontology (what is reality)	Reality is objective, single, and factual. Reality can be measured and known.
Epistemology (how do you know)	Knowledge acquisition is not related to moral content and values
Methodology (how do you find it out)	Mainly quantitative
	Cause-effect
	Statistical analysis

Source: Author's construct

4.2.2 The rationale for applying positivism in this research

A good comprehension of the philosophical stand in research helps select the appropriate paradigm (Durrheim, 2006). Brink et al. (2012) indicated that when the research emphasises observable facts devoid of biases, the positivist paradigm must be adopted. Antwi and Hamza (2015) indicated that using surveys, experiments, and quasi-experiments to uncover reality and truth is attributed to the positivist ideology. Furthermore, research has proved that a researcher who seeks to test hypotheses can suitably apply the positivist paradigm (Shank, 2002). Similarly, Durrheim (2006) and Antwi and Hamza (2015) opined that testing hypotheses with statistical methods to prove their reality is associated with positivism. Therefore, the positivist paradigm was deemed appropriate for this research. First, the study sought to investigate and measure the factors influencing e-commerce adoption in developing countries using the survey research technique of data collection that prevents the researcher from interfering with the respondents' response. Second, the study suggested several hypotheses tested with a statistical method, i.e., Structural Equation Modeling (SEM). The hypotheses' testing was based solely on respondents' responses; therefore, this study's results were not value-laden and were devoid of bias from the researcher. This method is associated with positivism's tenets described by Antwi and Hamza (2015) and Durrheim (2006).

4.3 Survey as a research method

According to Sarantakos (1998), research methods refer to the mode of inquiry and data collection and analysis tools. A research method's choice is based on the research's nature, the researcher's personal experience, and the target respondents (Creswell, 2009). Likewise, Yin (1994) suggested that the type of research questions, the degree of control of the actual behavioural events, and the focus on contemporary as against past events should inform the researcher on the research method to adopt. In this study, the survey research method was adopted. A survey is a quantitative approach to data collection. The type of research questions answered by this study required the testing of suggested hypotheses using the partial least square – structural equation modelling technique. Creswell (2009) advanced that if providing answers to research questions necessitates testing hypotheses, the survey is the most appropriate research method. From the positivism stance, the researcher's investigated phenomenon was independent; thus, the researcher had no control over the actual behavioural event. Furthermore, Creswell (2009) suggested that the survey research method be adopted when the study establishes the relationship among variables. The suggested hypotheses of this research and the quest to establish the relationship among the variables make the survey the appropriate research method to adopt.

4.4 Survey design

This study employed the rigour of designing, collecting, and analyzing data, as Creswell (2009) suggested. Designing a survey involves developing questions (items) to measure the latent constructs of a model. These measurements form the basis for accepting or rejecting the suggested hypotheses. This study suggested twelve hypotheses that were tested based on the response to the measurement items. According to Gay et al. (2012), survey studies come in two forms; cross-sectional and longitudinal survey. This study employed a cross-sectional survey. The survey was designed to collect data from Ghanaian adults who have experience with online purchases at a specific time.

The primary source of data for this research was obtained through a close-ended survey questionnaire. The survey was in section A, and section B. Section A collected demographic information from respondents such as gender, age, nationality, educational level, product purchased, number of purchases a year, and years of experience with an online purchase. In section B, respondents were asked to indicate their level of agreement or disagreement with

items on a 5-point Likert Scale ranging from 1 “strongly disagree” to 5 “strongly agree” (see Appendix A). These items were used as a measure for the variables in the conceptual model. For measuring performance expectancy, five (5) items were used. For effort expectancy, four (4) items were used. For social influence, five (5) items were used. Six (6) items were used to measure the facilitating conditions. The items were adapted from Venkatesh et al. (2003), and their validity and reliability have been tested across different contexts (Awiagah et al., 2015; Escobar-Rodríguez and Carvajal-Trujillo, 2014; Raza et al., 2019). Website quality was measured with five (5) items. Familiarity with an online vendor was measured with four (4) items. Trust was measured with four (4) items. Online security was measured with four (4) items. These items were adapted from Zhou (2012), Kim et al. (2008), Cyr et al. (2009), and Salisbury et al. (2001), respectively. The behavioural intention was measured with five items. These items were adapted from Venkatesh et al. (2003) and Davis et al. (1989).

4.5 Selecting of Survey participants

It is practically impossible to collect data from an entire population and even more rarely feasible if the population in question is geographically scattered (Gay et al., 2012). This claim shows the importance of carefully and correctly selecting research participants to represent the population. The response from a sampled population should be almost the same if the entire population were investigated. For this study, the target population was adult online shoppers in Ghana who have a valid method of online payment (i.e., bank accounts and debit cards). Ghana was selected because it is a middle-income country in Sub-Saharan Africa (a developing country).

Moreover, as this study investigates the adoption of e-commerce in developing countries, Ghana is a good fit. Second, ITU (2017) stated that eight out of ten Ghanaians are mobile and internet users. According to Mattern (2018), Ghana is one of the fast-growing technology adopters in Sub-Saharan Africa. Therefore, it is reasonable to investigate how the increase in internet usage and technology adoption in Ghana impacts online purchases. Third, the researcher’s ties with Ghana make it relatively easier to collect data for analysis.

The National Population Council (NPC) in December 2018 revealed that Ghana’s population is approximately thirty million (30million). Out of this, 62.4% are adults, i.e., 18 years and above. Furthermore, the UNCTAD B2C e-commerce index 2019 focus on Africa reported that Ghana has thirty-nine per cent (39%) of its population as internet users. This statistic

means that about eleven million seven hundred thousand (11,700,000) Ghanaians use the internet. The UNCTAD B2C e-commerce index further revealed that two per cent (2%) of the internet users shop online; thus, about two hundred and thirty-four thousand (234,000) of the Ghanaian population might be online shoppers.

In quantitative research, an ideal sample can represent the population from which it was selected (Castillo, 2009). Therefore, the purposive sample technique was employed (respondents were selected based on shared characteristics; the survey participants were online shoppers). This kind of sampling is also referred to as judgment sampling (Etikan et al., 2016). Hence, purposive sampling (homogeneous purposive sampling) was adopted as the appropriate technique to select the sample population.

The formula used to arrive at the minimum approved sample size for this study is;

$$N = (Zscore)^2 \times p(1-p)/e^2$$

Where;

N= minimum sample size

Zscore = critical value at 95% confidence level

p = the expected or probability of previous similar study

e^2 = the maximum allowable derivation of error of the estimate (margin of error)

With;

Zscore = 1.96

p = 50% or 0.50; this percentage was assumed because it always gives the biggest sample size (optimization).

e^2 = 0.05, the percentage point of 5% or 0.05 margin of error is based on Bartlett et al. (2001) suggestion. Bartlett et al. stated that in determining the minimum sample size for continuous data from a population greater than 10,000, a margin of error of 0.05 could be used.

We have;

$N = (1.96)^2 \times 0.50(1-0.50)/0.05^2$

N = 3.8416 × 0.25/0.0025

N = 384

Therefore, a minimum sample size of 384 purposively selected was seen to be appropriate.

4.6 Data collection method

The researcher initially decided to travel to Ghana to engage the respondents in the data collection. However, the outbreak of covid 19, which was later declared a pandemic by the World Health Organization (WHO) in March 2020, made it impossible to travel at the time. In addition, most countries, including Ghana and Hungary, closed their national borders to international travel. As a result, the researcher resorted to online data collection for both pilot and primary data collection. The survey instruments/measurement scales were developed with the LimeSurvey software. After the survey items were set and activated online, the software generated https://exam.ktk.pte.hu/demosurvey/index.php/348187?lang=en. The link was sent to respondents via e-mails, Facebook, and WhatsApp social media platforms. The respondents' selection criteria were that, first, they must be Ghanaian adults, and second, they should have a personal experience with an online purchase.

Moreover, since the target sample is Ghanaians who have bought items online or have experience with an e-commerce platform, a condition was set in the online survey that only allowed respondents to complete the survey with personal experience with e-commerce platforms. Therefore, the survey automatically ended for those who said they did not encounter the e-commerce platform. A sample of the survey questionnaire is shown in Appendix A.

The survey was pre-tested with two professors with expert knowledge to refine the items if needed and assess their relevance and accuracy. In addition, the professors provided constructive feedbacks that led to a revision of some questionnaire items. The questionnaire was piloted with 20 respondents from January 14, 2020, to February 20, 2020. The pilot survey aimed to ensure that the items were understood and reflected the study's objectives, and the pilot survey proved so. The primary data collection took place from March 2, 2020, to August 13, 2020. In all, 1,036 respondents were contacted cross-sectionally, out of which 540 filled questionnaires were handed in for analysis. This number represented a response rate of fifty-two per cent (52%). This number of observations is sufficient since it exceeds the minimum sample size required for analysis to employ structural equation modelling (Hair et al., 2020).

4.7 Mode of analysis

The analysis of the data was performed using SPSS v. 24 and SmartPLS v.3. SPSS was used to code the responses of the participants on items represented in each variable. The coded data were exported to the SmartPLS software to test for the measurement and the structural model. First, the demographic profile of respondents was assessed. This study examined the constructs' internal consistency using the Cronbach Alpha (α) to assess the measurement model. Second, the sample adequacy was measured using the Kaiser-Meyer-Olkin (KMO) and Barlett's Test of Sphericity. Third, composite reliability (CR), factor loadings (λ), and the average variance extracted (AVE) were computed to assess the convergent validity of the variables. Fourth, the discriminant validity was assessed using the correlation matrix of the constructs. The study first checked the collinearity assumption to ensure no multicollinearity issue exists in assessing the structural model fit. The Variance Inflation Factor (VIF) was used to determine the level of collinearity. Second, the model predictive power (R^2) and predictive accuracy were computed. The coefficient of determination of the variance in behavioural intention (R^2_b), actual usage (R^2_a), and online trust (R^2_T) was evaluated. The model accuracy was estimated using the Stone-Geisser Indicator (Q^2). Third, the model fit was examined. Eight model fit indices, namely; Adjusted Goodness of Fit Index (AGFI), Chi-Square/Degree of Freedom (χ2 /d.f.), Comparative Fit Index (CFI), The Goodness of Fit Index (GFI), Normed Fit Index (NFI), P-Value, Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) were evaluated to assess the goodness of fit of the measurement model. Fourth, the model path analysis was examined. The path analysis showed the variables' structural relationship, standardized beta coefficients, t-values, and p-values.

4.8 Summary

This chapter began by stating the author's research paradigm (positivism) and philosophical assumptions that guide the positivist research. Next, the chapter explained the rationale behind positivism as a research paradigm. Then, the data collection survey technique was employed as it is one of the most appropriate data collection methods in the positivist paradigm. Next, the selection of survey participants and the data collection method was explained. Finally, the mode of analysis outlining the sequence and order in which the findings and results were presented was further outlined.

CHAPTER FIVE

5. FINDINGS AND ANALYSIS

5.1 Introduction

This chapter presents the findings and provides an analysis of the data collected. The respondents' demographic profile, measurement model assessment, and structural model fit were described in detail in this chapter. This chapter aims to:

- Describe the demographic profile of respondents
- Assess the internal consistency of the constructs
- Examine the convergent validity and discriminant validity
- Report and assess the model predictive power and predictive accuracy
- Discuss the model fit test, and
- Review the model path analysis.

5.2 Demographic profile of respondents

Table 5.1 indicates that the sample comprised 59% male and 41% female. These percentages show that a fair ratio of males and females were sampled. Also, with age distribution, Table 5.1 showed that one hundred and forty-six, representing twenty-seven per cent (27%) of the respondents, were aged between 18-24 years. Eighteen (18) years is the legal adult in Ghana, and since the study seeks to investigate e-commerce adoption among adults in Ghana, it was prudent for the researcher to sample online shoppers who were 18 years and above. Respondents between the ages of 25 and 29 represented thirty-three per cent (33%) of the total respondents. Thirty per cent (30%) of respondents were between the ages of 30–40 years. Furthermore, respondents above 40 years represented 10% of the participants.

Table 5.1 Demographic variables

Variables	Frequency (N=540)	Percentage (%)
Gender:		
Male	318	59
Female	222	41
Age:		
18-24	146	27
25-29	178	33
30-40	162	30
>40	54	10
Educational level:		
Senior high	189	35
Tertiary	270	50
Professional	81	15
Products purchased:		
Books/Magazines	92	17
Clothes/Shoes	124	23
Computer accessories	140	26
Home appliances	130	24
Travel itinerary (airline tickets/reservations)	54	10
The number of purchases in a year:		
1 - 5	200	37
6 – 10	157	29
11 – 15	108	20
>15	75	14
Years of experience with e-commerce:		
1 – 5	365	68
>5	173	32

Table 5.1 also shows that 50% of respondents have a tertiary (university qualification) education. 35% have a high school qualification, whereas 15% have a professional qualification (ICAG, CIMA, ACCA) This finding may suggest that most respondents are well exposed to knowledge and the benefits of e-commerce adoption. Many products ranging from books/magazines to airline tickets have been purchased online by the respondents regarding products purchased. Most of the respondents (68%) have had between 1–5 years of experience with e-commerce.

5.3 Measurement model assessment

5.3.1 Internal Consistency of the constructs

The test for the internal consistency (reliability) of the ten (10) constructs was performed using Cronbach's Alpha (***α***). According to Hair et al. (2020) and Bagozzi and Yi (2012), a given variable's internal consistency should equal or exceed the threshold value of 0.7. In this study, the constructs' internal consistency values were seen above the recommended threshold, which shows an excellent internal consistency, as revealed in Table 5.3. Sample adequacy was also measured to assess the appropriateness of the data for factor analysis. The sampling adequacy was measured with Kaiser–Meyer–Olkin (KMO) and Bartlett's Test of Sphericity. As a rule of thumb, Kaiser and Rice (1974) suggested that KMO values greater than 0.5 can be considered adequate; however, a value of 0.9 to 1.0 is marvellous. According to Hair et al. (2020), the correlation among variables can be tested with Barlett's Test of sphericity. A statistically significant Barlett's test of sphericity (sig < 0.05) shows a significant correlation among the study variables. An approximate chi-square of 27155.55 with 972 degrees of freedom at a significant level of .000 was recorded. KMO value of 0.915 above the recommended threshold was also recorded. Table 5.2. illustrates these findings.

Table 5.2 KMO and Barlett's test of sphericity

Kaiser- Meyer- Olkin measure of sampling adequacy	0.915
Barlett's test of sphericity: Approx. Chi-square	27155.55
Df	972
Sig	.000

5.3.2 Convergent validity

The composite reliability (CR), factor loadings (λ), and Average Variance Extracted (AVE) were tested to measure the convergent validity of constructs. According to Hair et al. (2012), AVE value greater than 0.5, factor loadings greater than 0.6, and CR value greater than 0.7 are acceptable for convergent validity. In Table 5.3, the AVE values ranged from 0.518 to 0.711, CR from 0.841 to 0.925; however, three questionnaire items, namely; SOC1, ONLS1, and FAC4, were removed from the data set due to weak factor loadings that fell below the recommended threshold of 0.6 suggested by Hair et al. (2020). Factor loadings below 0.6 may not contribute significantly to the dataset. The remaining factors had loadings above 0.6, hence they were retained for the analysis. These findings suggested that all values for AVE and CR fall within the acceptable or recommended value. Also, the factor loadings exceeded the recommended value threshold of 0.6. Hence, the assumption of convergent validity was met. The factor loadings and path coefficients from the structural equation modelling output is presented in Figure 5.1

Table 5.3 Summary of exploratory factor analysis (EFA) results and reliabilities

Construct	Measurement	Factor loading (λ)
Actual Usage (ACTU)	AVE = 0.577, CR = 0.845, α = 0.769	
ACTU1	1: I use e-commerce sites frequently for my purchases	0.810
ACTU2	2: My purchases are mostly made through e-commerce sites	0.725
ACTU3	3: I purchase from e-commerce sites regularly	0.713
ACTU4	4: I currently make purchases from e-commerce sites	0.791
Behavioural Intention (BIN)	AVE = 0.682, CR = 0.914, α = 0.883, VIF = 2.661	
BIN1	1: I intend to continue purchasing products from e-commerce sites in the future	0.755
BIN2	2: I will encourage others to purchase from e-commerce sites	0.838
BIN3	3: I intend to increase my use of e-commerce when the opportunity comes	0.836
BIN4	4: I will always try to use e-commerce in my daily purchasing transactions	0.814
BIN5	5: I intend to use e-commerce frequently	0.880
Effort Expectancy (EET)	AVE = 0.608, CR = 0.860, α = 0.782, VIF =2.233	
EET1	1: Learning to navigate an e-commerce platform is easy for me	0.658
EET2	2: My interaction with e-commerce platforms is clear	0.790
EET3	3: I find it easy to accomplish my purchases using e-commerce platforms	0.876
EET4	4: I find it easy to find what I want on e-commerce platforms	0.780
Facilitating Condition (FAC)	AVE = 0.711, CR = 0.925, α = 0.899, VIF =1.642	
FAC1	1: I can get help from others when I have difficulties using e-commerce platforms	0.836
FAC2	2: I have the resources necessary to use e-commerce	0.831
FAC3	3: E-commerce platform is compatible with other technologies I use	0.866
FAC5	5: I have the necessary training to use e-commerce platforms	0.853
FAC6	6: The support service for e-commerce is dependable	0.831
Familiar with Vendor (FWV)	AVE = 0.584, CR = 0.849, α = 0.776, VIF =2.154	
FWV1	1: I am familiar with buying products from the online vendor	0.753
FWV2	2: I am familiar with the process of purchasing from online vendors	0.761
FWV3	3: I am familiar with buying products from online vendors	0.724
FWV4	4: Overall, I am familiar with online vendors	0.817
Online Security (ONLS)	AVE = 0.613, CR = 0.859, α = 0.771, VIF =1.043	
ONLS2	2: The web is a secure means through which to send sensitive information	0.902
ONLS3	3: I would feel safe to send sensitive information about myself over the web	0.832
ONLS4	4: I do not hesitate to make purchases from the web because of security issues of sensitive information	0.920

Performance Expectancy (PEE)	AVE = 0.659, CR = 0.906, α = 0.883, VIF =2.126	
PEE1	1: I find purchasing online useful in my daily life	0.814
PEE2	2: E-commerce sites enable me to accomplish my purchases more quickly	0.805
PEE3	3: I find e-commerce as a tool that adds value to my transaction process	0.806
PEE4	4: Buying from an e-commerce site makes my purchase more convenient	0.818
PEE5	5: Overall, I find adopting e-commerce to be advantageous in my online purchases	0.816
Social Influence (SOCI)	AVE = 0.518, CR = 0.841, α = 0.767, VIF = 2.356	
SOCI2	2: People who influence my behaviour influence my adoption of e-commerce	0.726
SOCI3	3: Friends suggestions and recommendations influence my use of e-commerce	0.790
SOCI4	4: I will use e-commerce because many people around me have adopted it	0.789
SOCI5	5: The mass media makes me purchase from e-commerce platforms	0.752
Trust (TRUS)	AVE = 0.594, CR = 0.854, α = 0.793, VIF =2.661	
TRUS1	1: I find e-commerce sites trustworthy	0.699
TRUS2	2: The website vendor gives the impression that it keeps promises and commitments	0.784
TRUS3	3: I believe that the website vendor has my interest in mind	0.793
TRUS4	4: The website can be trusted to carry out online transactions faithfully	0.806
Website Quality (WSQ)	AVE = 0.630, CR = 0.894, α = 0.851, VIF = 1.746	
WSQ1	1: The website of this seller quickly loads all texts and graphics	0.694
WSQ2	2: The website of the seller is easy to use	0.807
WSQ3	3: The website of the seller is easy to navigate	0.849
WSQ4	4: The website of this seller is visually attractive	0.773
WSQ5	5: The website of this seller gives me up-to-date information	0.835

α: Cronbach's Alpha

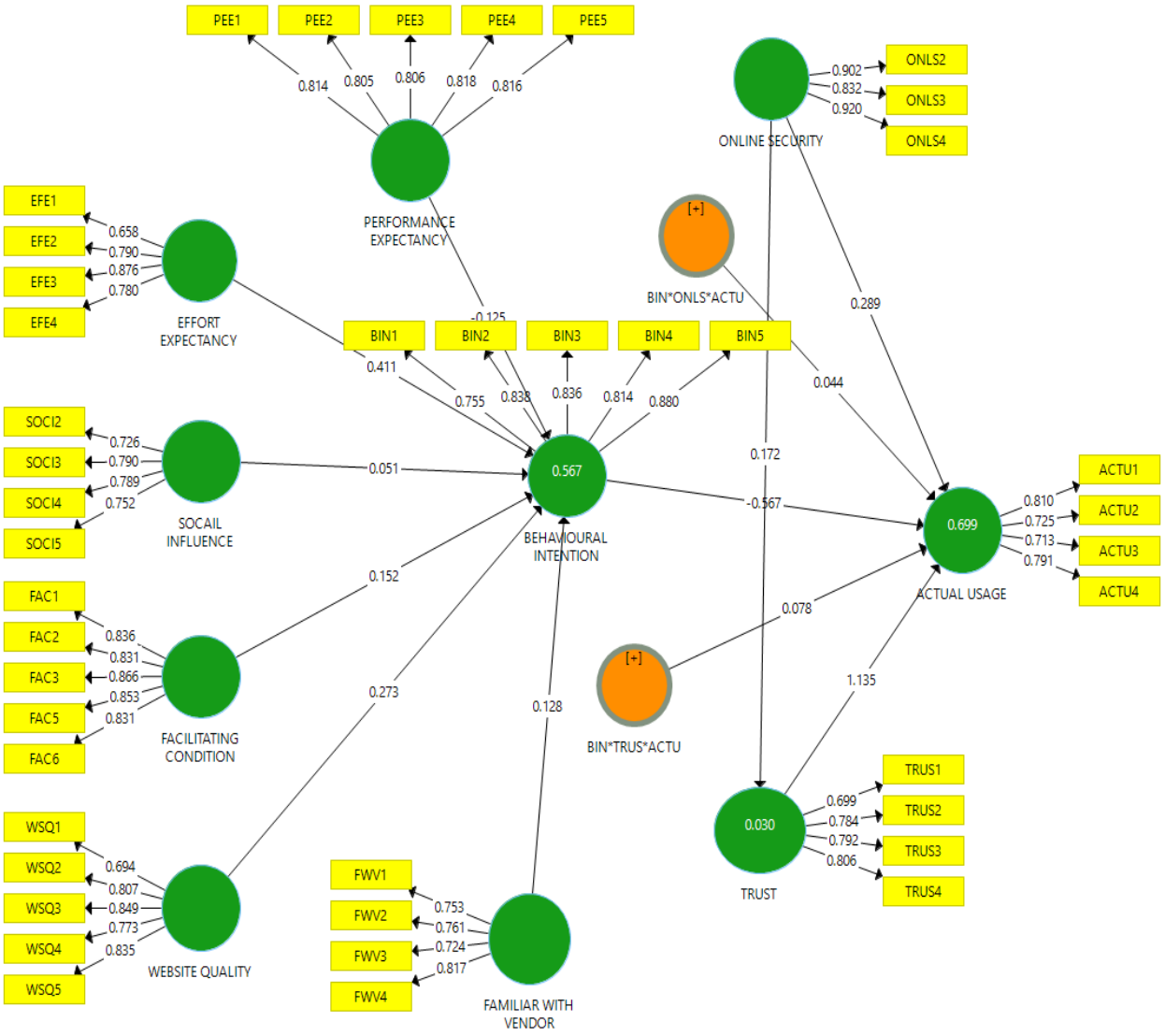
AVE: Average Variance Extracted = $\sum \lambda^2 / n$

CR: Composite Reliability = $(\sum(\lambda)^2 / (\sum(\lambda)^2 + (\sum a),\ a = 1 - \lambda^2$

Factor Loadings < 0.500 were omitted

VIF < 3.0 indicate no problem with collinearity

Figure 5.1 Factor loadings and path coefficients



Source: Data analysis (SMART PLS output)

5.3.3 Discriminant Validity

Discriminant validity is achieved when the square root of the Average Variance Extracted (AVE) for an individual construct is higher than the inter-factor correlation between the construct in the model or when the Square root of the AVE's exceeds its correction values (Kurfali et al., 2017). Thus, discriminant validity checks the constructs to ensure that those that should not be highly correlated are indeed found not to be highly correlated to each other. As presented in Table 5.4, the correlation matrix of the constructs shows that the square root of the AVE value (shown in bold) is higher than its corresponding correlations values, suggesting that the assumption of discriminant validity has been met.

Table 5.4 Correlation matrix of constructs

Construct	AVE	ACTU	BINT	EFE	FAC	FWV	ONLS	PEE	SOC	TRUS	WSQ
ACTU	0.577	***0.760***									
BINT	0.682	0.474	***0.826***								
EFE	0.608	0.536	0.672	***0.780***							
FAC	0.711	0.476	0.533	0.566	***0.843***						
FWV	0.584	0.684	0.549	0.606	0.510	***0.764***					
ONLS	0.613	0.426	0.196	0.429	0.370	0.421	***0.783***				
PEE	0.659	0.563	0.425	0.621	0.486	0.621	0.739	***0.812***			
SOC	0.518	0.595	0.528	0.599	0.508	0.630	0.434	0.623	***0.720***		
TRUS	0.594	0.725	0.526	0.651	0.542	0.651	0.196	0.429	0.644	***0.771***	
WSQ	0.630	0.573	0.605	0.536	0.440	0.517	0.262	0.413	0.597	0.734	***0.794***

Diagonal elements (italics) in the matrix represent the square root of AVE.

5.4 The structural model assessment

The measurement model confirmed that the data sampled for this study was valid and reliable. The next step was to assess the structural model. This stage included observing the model predictive power and accuracy, goodness-of-fit index, the relationship between the constructs, and evaluating the coefficient of determination. However, before assessing the model predictive power of the constructs, collinearity issues must be checked. According to Fox and Monette (1992), collinearity must be examined to make sure it does not bias the study model. Collinearity occurs when variables are highly correlated to the extent that it is difficult to obtain a reliable coefficient estimate. Collinearity was assessed using the Variance Inflation Factor (VIF). As a rule of thumb, VIF values less than three indicate the data has no problem with collinearity (Benitez et al., 2020). About table 5.3, all the VIF values were less than 3.0. Therefore, there was no collinearity issue in the constructs. Hence, the model predictive power and accuracy can now be examined.

5.4.1 Model Predictive Power (R^2)

The coefficient of determination (R^2) measures the predictive power of the structural model. Three values of the coefficient of determination were evaluated. One explains the variance in Behavioural intention (R^2_b), another explains the variance in Actual usage (R^2_a), and the last explains the variance in online Trust (R^2_T). The value of $R^2_b = 0.567$ indicates that performance expectancy, effort expectancy, social influence, facilitating condition, website quality, and familiarity with an online vendor moderately explain 56.7% of behavioural intention variance. Also, the value of $R^2_a = 0.699$ indicates that behavioural intention explains 69.9% of the variance in actual usage.

Furthermore, $R^2_T = 0.030$ indicates that online security somewhat explains users' online trust variance. It can, therefore, be concluded that the predictive power of the structural model is moderately good. Table 5.5 shows the model predictor power (R^2).

5.4.2 Model Predictive Accuracy (Q^2)

The model predictive accuracy was also assessed by using Stone-Geisser Indicator (Q^2). The Stone-Geisser Indicator (Q^2) measures the model prediction quality or model significance. It was calculated using the blindfolding techniques in Partial Least Square analysis. Hair et al. (2020) indicated that a good prediction accuracy should have an indicator value greater

than zero. Nevertheless, a perfect model would have $Q^2 = 1$, which indicates that the model reflects the actual reality without errors. Table 5.5 indicates that the values of Q^2 are greater than zero; this shows the predictive accuracy of the structural model. It also indicates that the constructs are essential for the general adjustment of the model.

Table 5.5 Model predictive power and relevance

Construct	**Coefficient of determination (R^2)**	**Constructed validated redundancy (Q^2)**
Behavioural Intention (R^2_b)	0.567	0.380
Actual Usage (R^2_a)	0.699	0.355
Trust (R^2_T)	0.030	0.120

$Q^2 > 0$ were obtained

5.4.3 Model Fit Test

The study further tested the model to ascertain whether it has a good fit with the sampled data. This test was done by performing Confirmatory Factor Analysis (CFA). However, eight model fit indices were evaluated and presented in table 5.6. It was evident that all the fit indices exceeded the accepted threshold, as suggested by Kurfali et al. (2017) and Hair et al. (2020). Therefore, it can be concluded that the measurement model has a good fit with the sample data collected for the study.

Table 5.6 The model fit

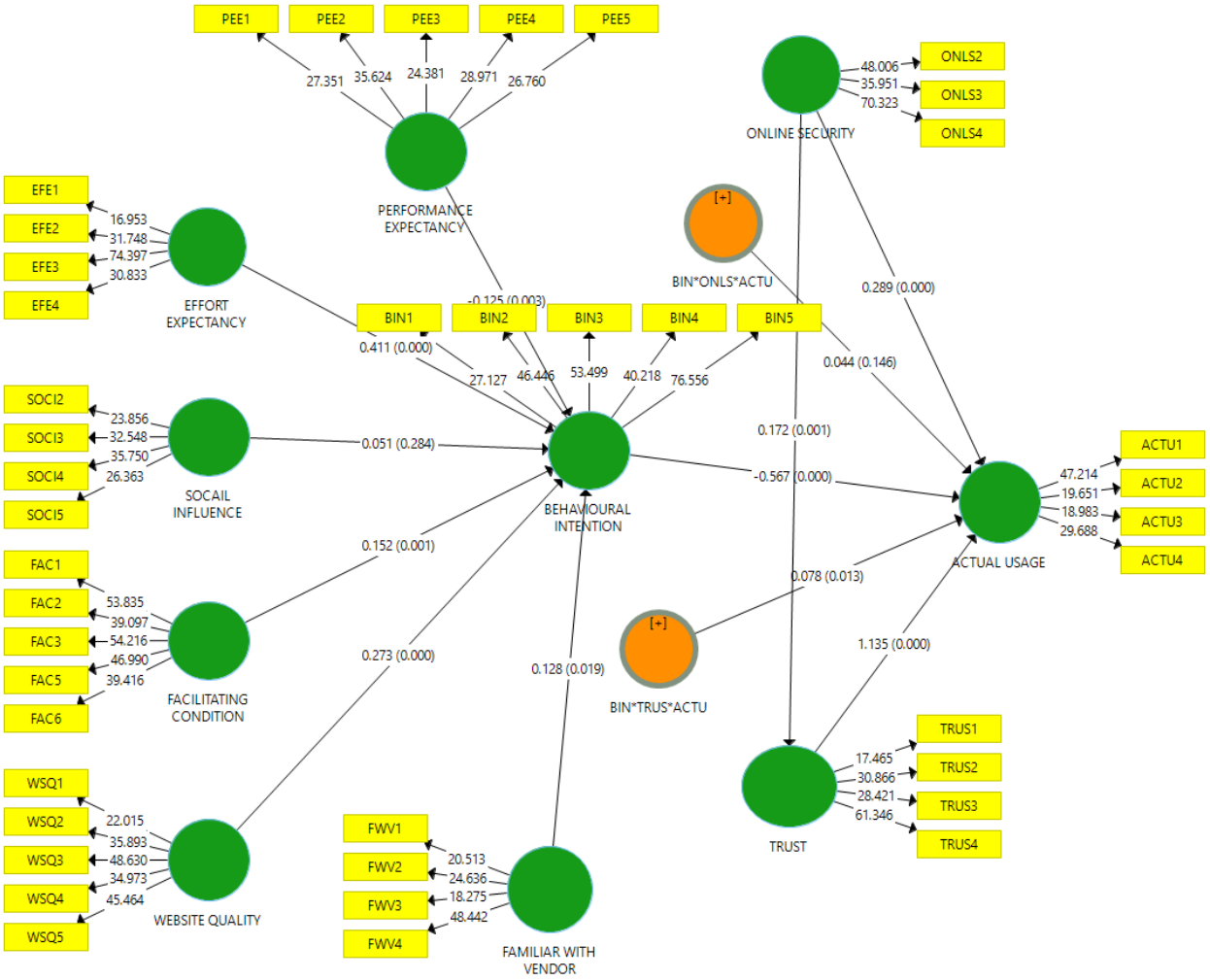
Fit index	**Recommended threshold**	**SEM value**	**Remark**
Adjusted Goodness of Fit Index (AGFI)	≥ 0.80	0.921	Good fit
Chi-Square/Degree of Freedom (x^2/d.f.)	≤ 3.00	2.432	Good fit
Comparative Fit Index (CFI)	≥ 0.90	0.953	Good fit
The goodness-of-fit index (GFI)	≥ 0.80	0.902	Good fit

Normed Fit Index (NFI)	≥ 0.90	0.954	Good fit
P-Value	< 0.05	0.045	Good fit
Root Mean Square Error of Approximation (RMSEA)	≤ 0.08	0.062	Good fit
Standardized Root Mean Square Residual (SRMR)	≤ 0.05	0.031	Good fit

5.4.4 Structural model estimation

The estimation of the structural model was performed to test H1 to H12. The Partial Least Square-Structural Equation Modelling method of non-parametric bootstrapping was used to test the significance of the estimated path coefficients (p-values). The p-values are shown in parenthesis. The model estimation shows the path coefficients depicted in Figure 5.2.

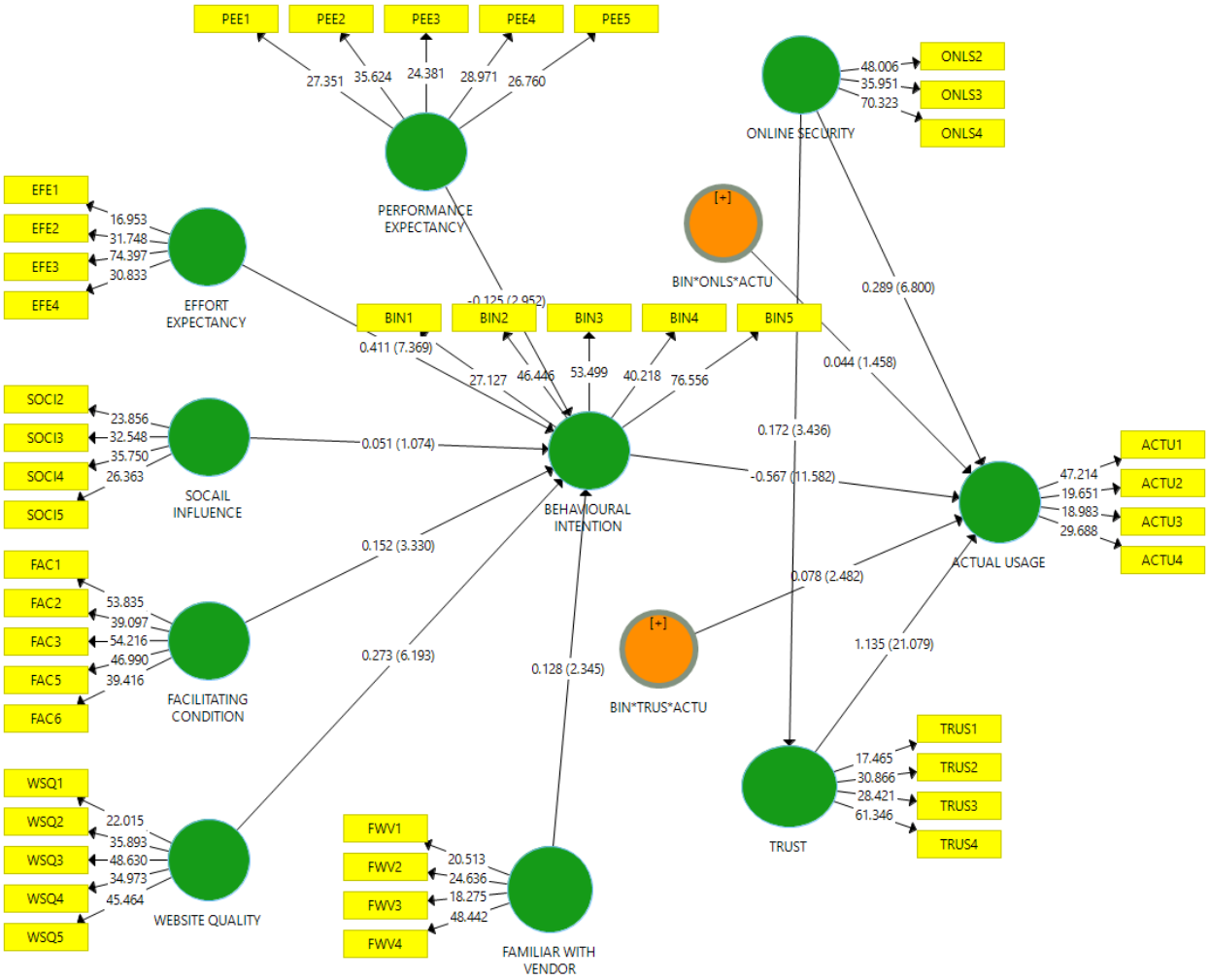
Figure 5.2 Structural model estimation showing the significance level (P - values)



Source: Data analysis (SMART PLS output)

The T-value of the coefficients is also presented in parenthesis against the coefficients in Figure 5.3. According to Hair et al. (2020), t-values greater than or equal to 1.99 are acceptable.

Figure 5.3 Structural model estimation showing the T-statistics (t-values)



Source: Data analysis (SMART PLS output)

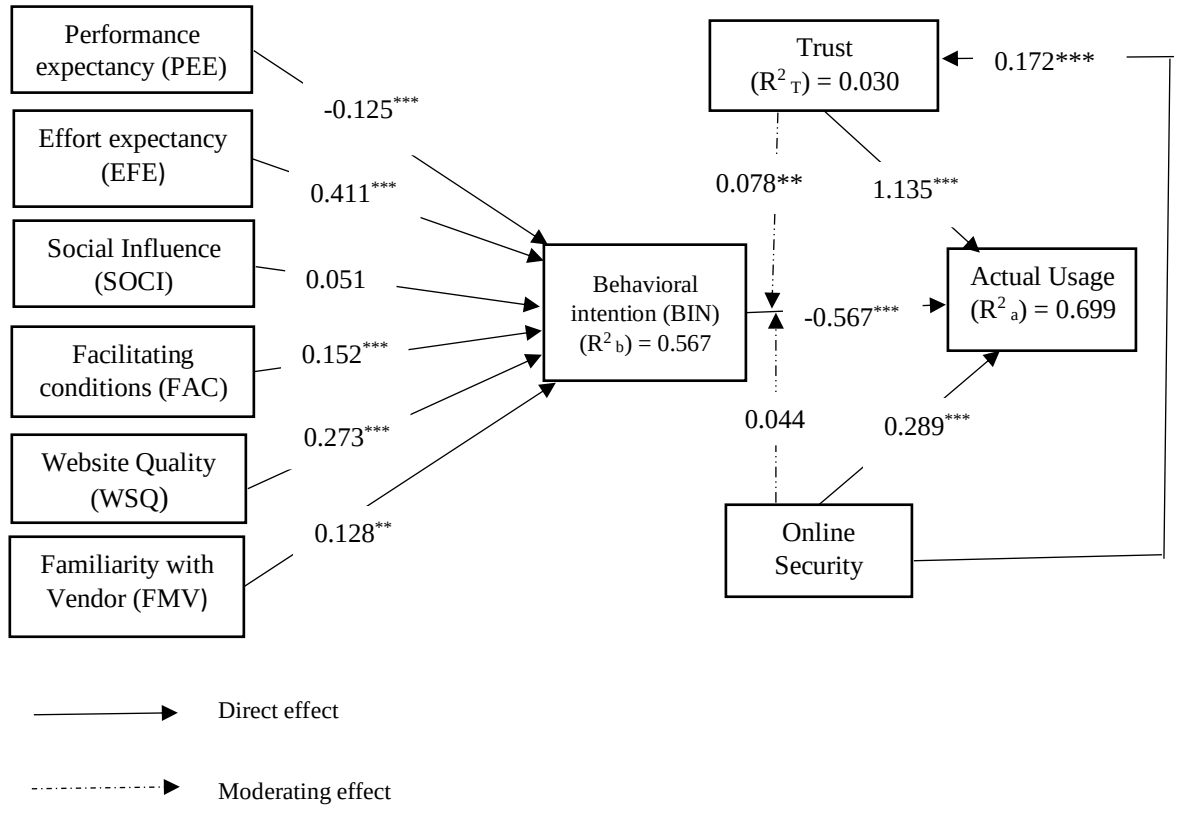
The structural path analysis revealed a significant negative influence of performance expectancy on behavioral intention (β = -0.125, t-value = 2.952, p < 0.01). Accordingly, the study reports that performance expectancy regresses significantly on behavioural intention to adopt e-commerce in Ghana. Hence, H1 was accepted. Further, effort expectancy is significantly associated with behavioural intention (β = 0.411, t-value = 7.369, p < 0.01), implying that effort expectancy is a significant predictor of consumers' behavioural intention to adopt e-commerce in Ghana. Thus, H2 was accepted. Contrary to the researcher's expectation, social influence was insignificantly associated with behavioral intention (β = 0.051, t-value = 1.074, p > 0.10), thus H3 is rejected. Facilitating conditions significantly influenced behavioural intention (β = 0.152, t-value = 3.330, p < 0.01), accordingly, facilitating conditions are a significant predictor of consumers' behavioural intention to adopt e-commerce in Ghana. Therefore, H4 was accepted. Moreover, website quality has a

significant influence on consumers' behavioural intention to adopt e-commerce in Ghana ($\beta = 0.273$, t-value = 6.193, $p < 0.01$), this throws support for H5. Hence, H5 was accepted. Furthermore, the structural path analysis showed familiarity with an online vendor to predict consumers' behavioural intention ($\beta = 0.128$, t-value = 2.345, $p < 0.05$), thus H6 was accepted. Performance expectancy, effort expectancy, social influence, facilitating conditions, website quality, familiarity with an online vendor accounted for 56.7 per cent of the variance in the behavioural intention to adopt e-commerce. The analysis revealed that 69.9 per cent of the variance in the actual use of e-commerce is predicted by behavioural intention. Furthermore, the structural path analysis indicated that behavioural intention significantly influenced the actual use of e-commerce ($\beta = -0.567$, $t = 11.583$, $p < 0.01$). Hence, H7 was supported. In addition, online security had a significant influence on the actual use of e-commerce ($\beta = 0.289$, $t = 6.800$, $p < 0.01$). This finding throws support for H8. Hence H8 is accepted. Furthermore, the structural path analysis confirmed that trust significantly influenced actual use ($\beta = 1.135$, $t = 21.079$, $p < 0.01$); hence, H9 was accepted. Also, the relationship between online security and trust was established. The results showed that online security has a significant effect on trust ($\beta = 0.172$, $t = 3.436$, $p < 0.01$). Thus, H10 was supported.

5.4.5 The moderation effects

More so, the study investigated the moderating effect of online security on the relationship between behavioural intention and actual use. The structural equation modelling results revealed that online security insignificantly moderates the relationship between behavioural intention and actual use ($\beta = 0.044$, $t = 1.458$, $p > 0.10$). Hence, H11 was rejected. Also, the moderating effect of trust on the relationship between behavioural intention and actual use was tested. The results showed a significant moderating effect of trust on the relationship between behavioural intention and actual use of e-commerce ($\beta = 0.078$, $t = 2.482$, $p < 0.05$). Therefore, H12 was accepted. The conceptual research model estimation is shown in Figure 5.4

Figure 5.43 The Conceptual research model estimation



Sig.*p < 0.10; **p < 0.05; ***p < 0.01

A summary of the model path analysis is presented in Table 5.7

Table 5.7 Summary of model path analysis

Structural relationship	Hypothesis	Beta coefficient	T-statistics	P- values	Decision
PEE → BIN	H1	-0.125	2.952	< 0.01***	Accepted
EFE → BIN	H2	0.411	7.369	< 0.01***	Accepted
SOCI → BIN	H3	0.051	1.074	> 0.10	Rejected
FAC → BIN	H4	0.152	3.330	< 0.01***	Accepted
WSQ → BIN	H5	0.273	6.193	< 0.01***	Accepted
FMV → BIN	H6	0.128	2.345	< 0.05**	Accepted

BIN ⟶ ACTU	H7	-0.567	11.583	< 0.01***	Accepted
ONLS ⟶ ACTU	H8	0.289	6.800	< 0.01***	Accepted
TRUS ⟶ ACTU	H9	1.135	21.079	< 0.01***	Accepted
ONLS ⟶ TRUS	H10	0.172	3.436	< 0.01***	Accepted
BIN×ONLS×ACTU ⟶ ACTU	H11	0.044	1.458	> 0.10	Rejected
BIN×TRUS×ACTU ⟶ ACTU	H12	0.078	2.482	< 0.05**	Accepted

Sig.*p < 0.10; **p < 0.05; ***p < 0.01, *t*-Value > 1.99
BIN = Behavioral Intention ACTU = Actual Usage FAC = Facilitating Condition SOCI= social Influence; PEE = Performance Expectancy EFE = Effort Expectancy; ONLS = Online security; TRUS = Trust, WSQ = website Quality, FWV = familiarity with Vendor

BIN × ONLS × ACTU → ACTU (moderating effect of online security on the relationship between behavioural intention and actual usage)

BIN × TRUS × ACTU → ACTU (moderating effect of trust on the relationship between behavioural intention and actual usage)

Summary

The chapter began with a presentation of the demographic profile of the sampled respondents. The results showed the male to female respondents' ratio, age distribution, educational level, product purchased, number of purchases in a year, and year of experience with e-commerce. The internal consistency of the constructs was tested using the Cronbach Alpha (α). Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity measured the sampling adequacy. The test for convergent validity was performed using the composite reliability (CR), factor loadings (λ), and average variance extracted (AVE) indices. The model's predictive power was assessed with the coefficient of determination (R^2) – the variance in behavioural intention, actual use, and online trust confirmed the model's good predictive power. Aside from the model's predictive power, the model's predictive accuracy was also tested with Stone-Geiser Indicator (Q^2). The model fit analysis also confirmed the model's good fit with the sampled data. The structural model assessment showed that performance expectancy, effort expectancy, facilitating conditions, website quality, and familiarity with an online vendor significantly affect behavioural intention. Social influence, on the other hand, has an insignificant influence on behavioural intention.

Additionally, the results show that behavioural intention, online security, and online trust significantly affect the actual use of e-commerce. As for the moderating effects, the results showed that online security insignificantly moderates the relationship between behavioural intention and actual use. However, online trust significantly moderates the relationship between behavioural intention and actual use contrary to online security.

CHAPTER SIX

6. DISCUSSION

6.1 Introduction

This chapter presents a discussion of the findings from the analysis. The discussion required the triangulation of research results from the various studies to explain the factors that influence the adoption of e-commerce in Ghana. The discussion explained what the findings tell us about this research. Also, it indicated how the findings were compared with previous researches highlighted in the literature review. It shows whether there are any contradictions with previous studies, and if there are, it explained why these inconsistencies exist. Furthermore, the discussion outlined the new and critical lessons from the study.

6.2 Discussion of hypotheses

6.2.1 The impact of performance expectancy on behavioural intention

This study reported that performance expectancy has a significant negative effect on behavioural intention. This result suggests that although online consumers perceive a significant effect of performance expectancy on behavioural intention in the Ghanaian context, performance expectancy does not positively influence behavioural intention. This phenomenon is unlikely in most situations but not unexpected, as previous studies have reported the same effect (Izuagbe, 2021; Tanaka et al., 2006). This finding is a valuable foundation for future research. This outcome may be based on the fact that most of the online shoppers sampled for this study are savvy online shoppers with an emotional attachment to online shopping, and therefore they may not consider the utility attributes of e-commerce as the basis for behavioural intention. The significant effect of performance expectancy on behavioural intention suggested in this study is consistent with Marinkovic et al. (2020), Netshirando et al. (2020), Joen et al. (2018), Soni et al. (2019), and Dewi et al. (2020). They reported a significant association between performance expectancy and behavioural intention to adopt a technology. Marinkovic et al. (2020) confirmed performance expectancy as a predictor of consumer satisfaction and continuance intention in mobile commerce.

Similarly, Netshirando et al. (2020) found that performance expectancy significantly influences purchase intention and repeat purchase behaviour. These findings are similar to Joen et al. (2018), who reported that performance expectancy is a significant determinant of consumers' intention to book flight tickets on smartphone applications. However, the studies

mentioned above reported a significant positive relationship, implying that consumers' intention to use online shopping applications and channels would increase if the performance expectancy to use online shopping channels increases. In addition, this current study differs from the previous studies as it reported a significant negative effect of PEE on BIN. However, this finding contradicts Lian (2015), Singeh et al. (2013), Yueh et al. (2015), and Faraliza et al. (2014), who reported an insignificant influence of performance expectancy on behavioural intention to adopt technologies.

6.2.2 The impact of effort expectancy on behavioural intention

This study also assessed the relationship between effort expectancy and behavioural intention and found that effort expectancy significantly influences behavioural intention to adopt e-commerce. The structural path coefficient (0.411) and the p-value < 0.01 indicated that effort expectancy was the strongest predictor of consumers' behavioural intention to adopt e-commerce in Ghana. The perceived ease of using e-commerce applications and e-commerce websites positively and significantly impacts behavioural intention to adopt e-commerce. In other words, the perceived physical and mental freedom associated with e-commerce has a significant effect on online consumers' behavioural intention in Ghana. This outcome means that when effort expectancy increases, the behavioural intention will also increase. This finding corroborates Kim and Lee (2020), who reported that effort expectancy significantly affects behavioural intention to use ICT. Equally, Soni et al. (2019) confirmed that effort expectancy is a significant predictor of consumer intention to adopt mobile shopping applications. Correspondingly, Netshirando et al. (2020) showed that effort expectancy positively and significantly influences purchase and repeat purchase intention. Furthermore, the finding agrees with Joen et al. (2018), who reported that effort expectancy is a significant predictor of consumers' intention to book flight tickets on smartphone applications. These findings show that the predictability and ease of using online shopping channels would make consumers develop a favourable attitude towards online shopping channels. It is essential to state that Ghanaian online vendors pay special attention to consumer efforts by promoting smoother online shopping channels. This finding implies that Ghanaian online shopper's decision-making on e-commerce adoption is influenced by how easy the online shopping system is to use. Thus, the greater the easiness of e-commerce systems, the higher the behavioural intention to use such systems. Prior research indicates that effort expectancy is significant for new technology users with lesser education levels

(Venkatesh and Davis, 2000). Nevertheless, this study's findings have shown that effort expectancy is equally crucial for incumbent users of e-commerce platforms. Considering the plethora of e-commerce applications available to consumers, they are interested in applications with easy-to-use interfaces.

6.2.3 The impact of social influence on behavioural intention

Contrary to the hypothesized relationship, the structural path analysis reported an insignificant relationship between social influence and behavioural intention to adopt e-commerce. P-value of 0.284 shown in Table 5.7 indicates that social influence is not a significant predictor of consumers' behavioural intention to adopt e-commerce in Ghana. Although a beta coefficient of 0.051 was reported on social influence, the insignificant p-value led to the rejection of the suggested hypothesis. This finding implies that individuals and significant others do not influence the consumers' behavioural intention to adopt e-commerce. This finding is in line with Soni et al. (2019), Sultana (2020), Raza et al. (2019), and Tarhini et al. (2019). Soni et al. (2019) reported an insignificant association between social influence and behavioural intention to adopt fashion mobile shopping applications. Correspondingly, Tarhini et al. (2019) reported an insignificant relationship between social influence and behavioural intention to adopt mobile commerce in developing countries. Equally, Wrycza et al. (2017) confirmed that social influence insignificantly predicts behavioural intention to use software engineering tools in academic education. This result confirms that social networks' power (reviews, suggestions, support, and recommendation of products and services from friends and social contacts) does not significantly impact the consumer behavioural intention to adopt e-commerce in Ghana. This finding is inconsistent with Adov et al. (2020), Isaac et al. (2019), and Shiferaw and Mehari (2019), who found that social influence significantly influences behavioural intention to adopt e-commerce.

Consequently, we can deduce that the opinions of others do not influence the use of e-commerce services. Given that online shopping has monetary implications, it is likely that a decision to use e-commerce systems will be driven by personal necessity and not by social influence. This study concludes that consumers adopt and use e-shopping channels when they feel the need to, not due to external pressure and influence from friends, family, or significant others.

6.2.4 The impact of facilitating conditions on behavioural intention

This research also showed a significant relationship between facilitating conditions and consumers' behavioural intention to adopt e-commerce. Therefore, this study concluded that facilitating conditions predict behavioural intention to adopt e-commerce in Ghana significantly. The availability of organizational and technological infrastructure (computers, Wi-Fi, help-line, and support service) that assist users during the actual use of e-commerce applications and the post-adoption support will significantly influence behavioural intention to adopt e-commerce. This finding supports Yoo and Roh (2019), Soni et al. (2019), Lawson-Body et al. (2018), Zhang et al. (2020). Yoo and Roh (2019) suggested a significant impact of facilitating conditions on students' behavioural intention to adopt e-books. Again, Soni et al. (2019) found that facilitating conditions predict consumer intention to adopt fashion mobile shopping applications. These findings support Lawson-Body et al. (2018), who reported a significant association between facilitating conditions and behavioural intention to adopt electronic books. It could be interpreted that consumers with adequate support systems that assist them anytime during the online purchase process will feel confident about using the system, and as a result, it increases their intention to use e-commerce applications and systems. It is also important to point out that developing countries, networks, and internet service providers should reduce the high cost of Wi-Fi and internet connection to encourage consumers to develop a positive behavioural intention to adopt e-commerce.

6.2.5 The impact of website quality on behavioural intention

The structural equation modelling findings showed a significant effect of website quality on consumers' behavioural intention to adopt e-commerce. This finding suggests that the greater the website quality, the greater the consumer intention to use the site for online purchase. This finding corroborates the findings of Liu et al. (2017), Sharma and Aggarwal (2019), Akram et al. (2018), and Giao et al. (2020). Liu et al. (2017) showed a positive and significant relationship between website quality and consumer purchase intention. Sharma and Aggarwal (2019) also indicated a positive and significant effect of website quality on e-commerce system success. These findings support Akram et al. (2018), who reported a positive and significant association between website quality and online impulse purchase behaviour.

Additionally, this finding agrees with Giao et al. (2020), who showed a significant effect of website quality on online purchase intention. This finding infers that the satisfaction

generated while surfing an e-commerce website positively impacts consumer intention to purchase via the website. When consumers are delighted with the website experience, they are more likely to develop a positive attitude towards its use. Therefore, when online consumers are happy with their experience with an e-commerce website, they will have a greater behavioural intention towards purchasing from the site. Prior studies, including Yoo et al. (2015), have enunciated a website's significance in influencing consumer decisions in the e-marketplace. It is important to note that the perceived ease of use of the e-commerce website, the visual appeal of the e-commerce website, and the timeliness of the website's information significantly influence consumers' intention to adopt e-commerce in Ghana.

6.2.6 The impact of familiarity with online vendor on behavioural intention

The structural equation modelling results revealed that familiarity with an online vendor significantly affects consumers' behavioural intention to adopt e-commerce. This finding implies that familiarity with an online vendor is a significant predictor of behavioural intention to adopt e-commerce in Ghana. As this study sought to improve and enrich the UTAUT model, familiarity with an online vendor was added as an external variable, and results from the structural path analysis proved it has a significant impact on consumers' behavioural intention. This finding is in line with the findings of Kaya et al. (2019), Azam and Aldehayyat (2018), and Amir and Rizvi (2017). Kaya et al. (2019) reported that familiarity with an online vendor has a significant and positive influence on purchase intention. This finding corroborates Azan and Aldehayyat (2018) and Amir and Rizvi (2017), who confirmed a positive and significant association between familiarity with vendors and consumers' willingness to engage in an online transaction. Indeed, in an online environment such as e-commerce platforms, uncertainty and ambiguity can be reduced when consumers are familiar with the online vendor. When consumers understand and are conversant with the online shopping website's procedures, their behavioural intention to use the website and buy from it is enhanced. For instance, when Ghanaian online consumers are familiar with an e-commerce website like Amazon, it increases their trust level, eventually increasing their intention to use it. Chang et al. (2015) also indicated that familiarity positively influences purchase behaviour. The finding of this study confirms this suggestion. Moreover, Lee and Tan (2003) and Riley et al. (2009) found that consumers are more likely to purchase from a website when familiar with the shopping site and the online vendor.

6.2.7 The impact of behavioural intention on actual usage

Additionally, this study hypothesized that behavioural intention would significantly influence the actual use of e-commerce. The findings showed that behavioural intention has a significant negative impact on the actual use of e-commerce applications and platforms in Ghana. In the proposed model for this research, behavioural intention explains almost 70% of the variance in actual usage, which is higher than the six variables (performance expectancy, effort expectancy, social influence, website quality, and familiarity with an online vendor) that explains 56% of the variance in behavioural intention. This finding implies that behavioural intention is a more potent and significant predictor of the actual use of e-commerce. Furthermore, the subjective probability that consumers would like to use e-commerce applications significantly influences the application's actual use. This result suggests that online consumers' readiness in Ghana to engage in an online shopping platform is significant but negatively influences its actual use. The significant effect of behavioural intention on user behaviour is supported by previous studies (Hossain et al., 2019; Wrycza et al., 2017; Shiferaw and Mehari, 2019; Sobti, 2019). Hossain et al. (2019) found a significant relationship between behavioural intention and the actual adoption of electronic health records in the healthcare system.

Similarly, Wrycza et al. (2017) reported a significant impact of behavioural intention on the actual use of software engineering tools in academic education. This finding aligns with Shiferaw and Mehari (2019), who showed that behavioural intention significantly impacts an electronic medical records system's actual use. Correspondingly, Sobti (2019) suggested and confirmed a significant effect of behavioural intention on mobile payment services' actual use. However, this study's negative effect reflects that a significant intention towards a behaviour does not directly imply that consumers would engage in the behaviour. The influence of the respondents' perceived behavioural control and affordability may have impeded the positive relationship between behavioural intention and actual user behaviour. This finding is consistent with Lim (2015), Ajzen (1991), and Carrigan and Attalla (2001).

6.2.8 The impact of online security on actual usage

The structural equation modelling results indicate that online security has a significant effect on the actual usage of e-commerce. This finding means that online security is a predictor of the actual use of e-commerce in Ghana. The online shopping website perceived security as

a secure means consumers can send sensitive information such as bank name, bank account number, and CVV (card verification value), significantly affect their actual purchase behaviour. This finding corroborates Patel and Patel (2018), Dwivedi et al. (2017), and Xu et al. (2012). Patel and Patel (2018) reported a significant positive relationship between online security and behavioural intention to use internet banking. Similarly, Dwivedi et al. (2017) suggest that perceived online security significantly influences an online purchase. In the same line, the findings from Xu et al. (2012) indicated that consumers perceived the safety of the personal and sensitive information they put on the website as a significant factor affecting their purchase intention. Extant literature has shown that online security significantly affects purchase intention (Gurung and Raja, 2015; Patel and Patel, 2018; Yenisey et al., 2005; Gupta and Dubey, 2016; Escobar-Rodriguez and Bonson-Fernandez, 2017). However, this study investigated beyond the dominantly tested effect of online security on online purchase intention to explore the direct relationship between online security and actual online purchase behaviour. The research found that consumers' perception of online security significantly influences the actual online purchase behaviour.

6.2.9 The impact of perceived online trust on actual usage

Furthermore, the study hypothesized that online trust would significantly influence the actual use of e-commerce. The structural equation modelling results indicate that online trust's perception has a beta coefficient of 1.135 with a $p < 0.01$. This result indicates that trust is a positive and significant determinant of the actual use of e-commerce in Ghana. Implying that consumers perception of an e-commerce site as trustworthy significantly influences their actual online purchase behaviour. Similarly, when e-vendors give the impression that they keep their promise and commitment to consumers, it influences consumer trust, translating into actual online purchases. This finding is similar to Stouthuysen (2020), Bhattacherjee (2002), Tarhini et al. (2019), Cui et al. (2020), Sakar et al. (2020), Oliveira et al. (2017), Sullivan and Kim (2018). Findings of Stouthuysen (2020) suggested that actual purchase decisions are made when consumers trust e-commerce sites. Equally, Bhattacherjee (2002) also indicated that trust is an antecedent of actual behaviour. A study by Oliveira et al. (2017) also reported a positive and significant association of trust with online purchase intention. These findings align with Sullivan and Kim (2018) findings which suggested that online trust is a major determining factor of an online re-purchase intention. When consumers have less trust in e-commerce websites, they become adamant about making purchases. Prior researches have investigated the effect of online trust on online purchase intention. However,

only a few have explored the direct relationship between online trust and the actual use of e-commerce applications for online purchases. This study filled this literature gap by empirically investigating the direct relationship between perceived online trust and the actual online purchase behaviour among online consumers in Ghana.

6.2.10 The impact of online security on online trust

Additionally, this study assessed the relationship between online security and perceived online trust and found that online security significantly influences the online trust of e-commerce. The structural path coefficient of 0.172 and $p < 0.01$ shows that online security directly and significantly affects online trust among online consumers in Ghana. This result implies that the web's perceived security as a secure means for consumers to send sensitive information such as bank name, bank account number, and CVV (card verification value) positively and significantly affect online trust perception. This finding is consistent with Riquelme and Roman (2014), Rouibah et al. (2016), and McCole et al. (2010). The findings of Riqueline and Roman (2014) suggested a positive and significant relationship between online security and consumers' online trust. Likewise, Rouibah et al. (2016) found a significant effect of online security on trust to use online payment systems. These findings are consistent with McCole et al. (2010), who indicated that online security positively and significantly influences online consumer trust towards online purchasing.

6.2.11 Moderating effect of online security

Besides the factors influencing behavioural intention to use e-commerce applications for online purchases by online consumers, this study further explored the moderating effect of online security on the relationship between behavioural intention and the actual use of e-commerce. Surprisingly, contrary to the author’s suggested hypothesis, the results showed an insignificant moderating effect of online security on the relationship between behavioural intention and the actual use of e-commerce. This result may imply that online security as a moderator does not interact significantly with the relationship between behavioural intention and actual use. The strength of the relationship between behavioural intention and actual use is unaffected by online security perception. This finding means that consumers' perception of the web and e-commerce platforms as a secure means to send sensitive information for purchase purposes insignificantly affects the association of behavioural intention and actual use of the e-commerce platform. Although previous studies have examined the effect of online security on behavioural intention (Yenisey et al. 2005; Gupta and Dubey, 2016;

Gurung and Raja, 2015; Patel and Patel, 2018), these studies have assumed that online security has a direct effect on behavioural intention. To the best of the author's knowledge, this study is one of the first to examine the moderating effect of online security on the relationship between behavioural intention and actual use of e-commerce platforms for online purchases by online consumers in a developing country, especially Ghana.

6.2.12 The moderating effect of perceived online trust

This research also investigated the moderating effect of online trust on the relationship between behavioural intention and actual use. The results showed that online trust significantly moderates the relationship between behavioural intention and actual use. The relationship between behavioural intention and actual use of e-commerce increases when consumers have higher perceived online trust. This finding means that when consumers trust the web and e-commerce platforms, it significantly increases behavioural intention on the actual use of the e-commerce platform. This result may imply that online trust as a moderator significantly interacts with the relationship between behavioural intention and actual use. This finding is consistent with Hsu et al. (2014), who found a positive and significant moderating effect of trust on the link between flow experience and continuance intention. Similarly, Phua et al. (2016) also found a significant moderating effect of trust on the link between brand commitment and membership intention.

Summary

This chapter began to discuss the study results and compare the results with previous studies in the literature. To achieve this, the author discussed the impact of the independent variables on the dependent variables and revealed the hidden connection between them.

Table 6.1 presents a summary of the discussion chapter.

Table 6.1 Summary of discussion

Hypothesized path	**Decision**	**Remarks/causes/reasons**
PEE ⟶ BIN	Accept	This outcome may be based on the fact that most of the online shoppers sampled for this study are savvy online shoppers with an emotional attachment to online shopping, and therefore they may not consider the

		utility attributes of e-commerce as the basis for behavioural intention. Nevertheless, this result presents an opportunity for further research to explore the utilitarian dimension of e-commerce.
EFE ⟶ BIN	Accept	The perceived ease of using e-commerce applications and e-commerce websites positively and significantly impacts behavioural intention to adopt e-commerce. In other words, the perceived physical and mental freedom associated with e-commerce has a significant effect on online consumers' behavioural intention in Ghana. This outcome means that when effort expectancy increases, the behavioural intention will also increase. In addition, consumers will be more likely to use e-commerce systems if the processes are easier to complete.
SOCI ⟶ BIN	Reject	This finding implies that individuals and significant others do not influence the consumers' behavioural intention to adopt e-commerce. As a result, we can deduce that the opinions of others do not influence the use of e-commerce services. Furthermore, given that online shopping has monetary implications, a decision to use e-commerce systems will likely be driven by personal necessity and not by social influence.
FAC ⟶ BIN	Accept	This result implies that the availability of organizational and technological infrastructure (computers, Wi-Fi, help-line, and support service) that assist users during the actual use of e-commerce applications and the post-adoption support will significantly influence behavioural intention to adopt e-commerce.
WSQ ⟶ BIN	Accept	This result delineates that when consumers are contented with surfing the e-commerce website due to website responsiveness, visual aesthetics, and

		information quality, it significantly influences behavioural intention.
FMV ⟶ BIN	Accept	This result indicates that when online consumers are familiar with e-vendors and the procedures involved in buying from their websites, it reduces the uncertainty and risk perception of online purchases. Furthermore, this kind of familiarity significantly influences behavioural intention.
BIN ⟶ ACTU	Accept	This result signifies that consumers' subjective probability of using e-commerce applications significantly influences the application's actual use. This result suggests that online consumers' readiness in Ghana to engage in an online shopping platform is significant but negatively influences its actual use.
ONLS ⟶ ACTU	Accept	This finding indicates that online security is a predictor of the actual use of e-commerce in Ghana. The online shopping website perceived security as a secure means consumers can send sensitive information such as bank name, bank account number, and CVV (card verification value), significantly affect their actual purchase behaviour.
TRUS ⟶ ACTU	Accept	Implying that when consumers perceive an e-commerce site as trustworthy, it significantly influences their actual online purchase behaviour.
ONLS ⟶ TRUS	Accept	This result implies that the web's perceived security as a secure means for consumers to send sensitive information such as bank name, bank account number, and CVV (card verification value) positively and significantly affect online trust perception.
BIN*ONLS*ACTU ⟶ ACTU	Reject	This result signifies that online security as a moderator does not interact significantly with the relationship between behavioural intention and actual use. The strength of the relationship between behavioural

		intention and actual use is unaffected by online security perception.
BIN*TRUS*ACTU ⟶ ACTU	Accept	This finding means that when consumers trust the web and e-commerce platforms, it significantly increases behavioural intention on the actual use of the e-commerce platform. These results point out that online trust positively influences the relationship between behavioural intention and actual use.

Source: Author's construct

CHAPTER SEVEN

CONCLUSION

7. SUMMARY, RESEARCH IMPLICATIONS, AND FUTURE RESEARCH DIRECTIONS

7.1 Introduction

This thesis undertook an empirical investigation of factors that influence e-commerce adoption in a developing country context. This study brings about new theoretical reasoning with its foundation from a conceptual model, extending the UTAUT model in a new research environment. This research's chief objective was to develop a conceptual model indicating the factors that influence e-commerce adoption and explore the moderating effect of online trust and online security on the relationship between behavioural intention and actual use of e-commerce. More so, the model examined whether online security has a direct influence on online trust. The research questions on which this study hinges are: 1. What are the determining factors of e-commerce adoption in Ghana? 2. What is the moderating effect of trust and online security on the relationship between behavioural intention and actual use of e-commerce? 3. Does online security directly influence the trust of Ghanaians to adopt e-commerce? To answer these questions and achieve the study's objective, this research embarked on a systematic review of relevant literature on e-commerce adoption in developing countries. The literature review was done to classify the literature based on themes, research frameworks, research methodology, and the level of analysis. These were encapsulated in chapter 2. Explaining how Venkatesh et al. (2003) empirically compared eight models to arrive at the UTAUT model in chapter 3, a conceptual framework was proposed to provide a better insight into e-commerce adoption antecedents. The framework further verified the moderating effect of online trust and online security on the relationship between behavioural intention and actual use of e-commerce. Furthermore, the effect of online security on online trust was verified. The author's research paradigm and philosophical assumption, the research method employed, the survey design, the survey respondents' selection, the data collection method, and the analysis of the data collected were consolidated in chapter 4. The results and findings from the data were presented in chapter five. Chapter six presented a discussion of the quantitative investigation. This chapter summarizes the research findings to pinpoint the theoretical and practical implications and

present the research contributions. Limitations of the research and future research lines are also discussed.

7.2 Synopsis of the research

The rapid diffusion of information technology and information systems in many aspects of our lives has brought about a paradigm shift in many business operations worldwide. Information technology has shaped how organizations interact with consumers and vice versa. An area of business and marketing that has seen significant strides with the advent of the internet and technology is e-commerce. Many organizations have developed e-commerce platforms to facilitate and increase their market share and their consumer reach. The covid-19 global pandemic has also changed consumers' behaviour towards online sale channels, as more consumers now resort to online purchases, and this new paradigm shift is likely to linger post-pandemic. A few prior studies have investigated the factor that may influence the adoption of e-commerce by consumers. However, most of these studies focused on developed countries (Holger and Wilhelm, 2019; Kwak et al., 2019; Ming et al., 2019; Williams et al., 2009). Surprisingly, there is a dearth of research with a focus on e-commerce adoption factors in developing countries. As a result, findings on e-commerce adoption factors in developing countries are inconsistent and inconclusive. It is essential to point out that developed countries' infrastructure, technology, political, economic, social, and cultural perspectives are different from developing countries. Therefore, findings from e-commerce adoption research in developed countries cannot be implied in developing countries. The industrialization and per-capita incomes are high and effective in developed countries compared to developing countries' slow and steady industrialization rate. Developed countries have low poverty and unemployment rate, but this level is considerably high in developing countries. Also, the standard of living is high in developed countries but low in developing countries. In terms of internet usage, approximately eighty-seven per cent of people in developed countries are savvy internet users, compared to forty-five per cent of savvy internet users in developing countries. This study disclosed that some driving factors influence e-commerce adoption in a developing country, which can be examined in a model.

The possible adoption factors were performance expectancy, effort expectancy, facilitating conditions, website quality, familiarity with an online vendor, online security, online trust, and behavioural intention. A conceptual framework was proposed to verify the hypothesized effect of the factors influencing Ghana's e-commerce adoption. An investigation was carried

out to assess online security and online trust's moderating effect in the model for empirical testing. Furthermore, an attempt was made to assess the effect of online security on online trust. The model test required methodological accuracy; therefore, data were collected purposively and cross-sectionally among online consumers in Ghana. The data collection gathered 540 responses, representing a 52 per cent response rate. The conceptual model was tested using the partial least square – structural equation modelling (PLS-SEM). The results from the model fit indices indicated that the proposed model has a good fit with the data collected (AGFI = 0.921, X^2/d.f. = 2.432, CFI = 0.953, GFI = 0.902, NFI = 0.954, P-value = 0.045, and RMSEA = 0.062). The coefficient of determination (R^2) revealed the predictive/ explanatory power of the conceptual model. The value of R^2_b = 0.567 shows that performance expectancy, effort expectancy, social influence, facilitating conditions, website quality, and familiarity with online vendors predict 56.7% of the variance in behavioural intention. Also, R^2_a = 0.699 indicate that behavioural intention, online trust, and online security predict 69.9% of the actual use variance. More so, R^2_T = 0.030 indicates that online security partially explains the variance in online trust.

The author concluded that the proposed model's predictive/explanatory power is good based on these results. In essence, the proposed model's structural model estimation indicates that performance expectancy, effort expectancy, facilitating conditions, website quality, and familiarity with the online vendor are the significant predictors of behavioural intention to adopt e-commerce in Ghana (supporting H1, H2, H4, H5, and H6). Contrary to the hypothesized relationship, the results showed an insignificant effect of social influence on behavioural intention (H3 was rejected). On the other hand, behavioural intention showed a significant negative influence on actual use (supporting H7). Moreover, as hypothesized, online security and online trust significantly impact the actual use of e-commerce in Ghana (supporting H8 and H9). The findings also revealed that online security significantly impacts online trust (supports H10). The model further assessed the moderating impact of online security and online trust on the relationship between behavioural intention and the actual use of e-commerce. The study found an insignificant moderating impact of online security on the relationship between behavioural intention and actual use (H11 was rejected). On the other hand, this study's findings supported the hypothesized significant moderating impact of online trust on the relationship between behavioural intention and actual use of e-commerce (H12 was accepted).

7.3 Revisiting the research questions

The premise of this study is based on the fact that most internet users in developing countries sparingly used it for e-commerce services. Most internet users in this region focus on other purposes such as social interactions and news reading rather than online purchases. The literature on e-commerce points out that inadequate national policies for e-commerce development, inadequate investment in telecommunication infrastructure, high cost of internet data, and lack of legal and economic regulatory climate, and unreliable postal service are responsible for the low e-commerce adoption in developing economies. This research argues that developing countries need to circumvent these inhibitors to achieve e-commerce benefits. In order to analyze this argument, this research suggests a conceptual model (Fig 3.3) that explores the determining factors that may influence the adoption of e-commerce. The conceptual model presented twelve (12) suggested hypotheses whose empirical validation provided answers to the research questions.

Hypotheses 1 to 7 provided an answered to question one, hypotheses 8, 9, 11, 12 answered question 2, while hypothesis 10 answered question 3. Question one stated, "*What are the determining factors of e-commerce adoption in Ghana?"* After a scientific measurement and assessment evaluation to test hypotheses 1 to 7, the author concluded that performance expectancy, effort expectancy, facilitating conditions, website quality, and familiarity with online vendors influence behavioural intention significantly. Consequently, behavioural intention significantly influences the actual use of e-commerce in Ghana. This finding provides an answer to question one. Then again, the scientific evaluation of hypotheses 8, 9, 11, and 12 provided an answer to question two, *"What is the moderating effect of trust and online security on the relationship between behavioural intention and actual use of e-commerce?"* The research gathered that online trust significantly moderates the relationship between behavioural intention and actual usage of e-commerce systems. However, online security insignificantly moderates the relationship between behavioural intention and actual use compared to online trust. These findings provide an answer to question two. Finally, question three stated, *"Does online security directly influence the trust of Ghanaians to adopt e-commerce?"* The scientific evaluation of hypothesis 10 and the hypothesis test results provided the author with evidence that online security directly and significantly influences the trust of Ghanaians to adopt e-commerce. This finding answers to question three.

7.4 Theoretical and practical implications of the research findings

This research presents theoretical and practical implications for researchers and practitioners engrossed in e-commerce development, especially in developing countries.

7.4.1 Theoretical implications

To analyze this study's theoretical implications, let us begin with the literature review in chapter 2 and the research framework in chapter 3. About the literature review, this research opines that, first, research on e-commerce adoption in developing countries seems to have gained considerable attention from scholars and researchers, and it is a research area that is proliferating. Nevertheless, as mentioned earlier in chapter 3, most research on e-commerce focusing on a developing country has been silent in addressing website quality, familiarity with an online vendor, perceived online security, and perceived online trust and their impact on e-commerce adoption. Further, the literature has been silent on the moderating effect of perceived online security and perceived online trust on the relationship between behavioural intention and the actual use of e-commerce. This study has filled these research gaps, and its findings have opened more opportunities to advance future research.

Second, in an attempt to investigate and provide a better understanding of the factors influencing e-commerce adoption, many studies have adopted models such as the technology, organization, and environment model (TOE), the technology acceptance model (TAM), the theory of reasoned action (TRA), the theory of planned behaviour (TPB), and the unified theory of acceptance and use of technology (UTAUT) as the theoretical investigative lens. However, this study is one of the few works to propose a conceptual framework that provides unique insights and a better understanding of e-commerce adoption (Figure 3.2). This study suggested hypotheses and provided evidence that can be a sound theoretical base for future research. As a result, the author advocates applying and developing this proposed framework in future research on e-commerce in a developing country context. Arguably, this study is one of the few studies to apply a positivist perspective to e-commerce adoption research in a developing country. The positivist paradigm enabled the author to cut away from ‘knowledge’ with prejudice, supposition, and other non-scientific opinions about e-commerce adoption factors in a developing country. The author suggested only the factors that conformed to this paradigm's vigorous investigation standards devoid of subjective meaning. This research presented an objective

finding of the factors influencing e-commerce adoption in a developing country through the positivist approach.

The strides made by this research to propose a conceptual model to investigate e-commerce adoption factors in a developing country, though not exhaustive, has provided some important theoretical implications and unique insights that can serve as a springboard to guide researchers in future research.

7.4.2 Practical implications

This research found that performance expectancy, effort expectancy, facilitating conditions, website quality, familiarity with an online vendor, behavioural intention, perceived online trust, and perceived online security as factors that influence individual adoption of e-commerce in Ghana. The next question the author asked is 'what are the implications of these findings to Ghanaians, web business designers, and managers of firms that wish to harness the benefits of e-commerce in Ghana, and suggestive to developing countries in general. The positive impact of performance expectancy on behavioural intention suggests the usefulness of e-commerce to Ghanaian online consumers. Hence, the managers of e-commerce platforms must identify the advantages of using their online shopping platforms, such as reduced cost, time-saving during transactions, and increase productivity. Managers must communicate these advantages to their stakeholders through promotional programs and incentives. This communication would educate potential customers who may intend to use e-commerce applications on the benefits of adopting e-commerce. Also, designers of e-commerce websites should ensure that the website they build would serve consumers effectively and efficiently with no error to avoid consumer loss. The findings also suggest that effort expectancy is a significant predictor of e-commerce adoption. The e-commerce system developers should design the e-commerce website/application to make navigating the e-commerce website easier for consumers. The interface interaction with the users of the e-commerce platform should be clear. The catalogue of products displayed online should be appropriately categorised and arranged to make it easy for consumers to find the products they need. Facilitating conditions regressed positively and significantly on behavioural intention. Managers of e-commerce platforms should ensure consumers can access 24 hours a day support services whenever they encounter difficulties using their e-commerce platform. Managers must endeavour to equip their consumers with the necessary resources

to use their e-commerce platforms conveniently. Consumers should be trained on the steps/procedures involved in the online purchasing process.

This research presents valuable insights on how e-vendors can enhance consumers' perception of website appeal. The findings suggest that website quality significantly influence behavioural intention to adopt e-commerce. Therefore, web business designers should build e-commerce sites that provide advanced search functionality to enhance consumers' search experience. The website must provide quality service delivery. E-vendors and website business designers should ensure that the website provides top-notch navigation guidance to consumers. Website business designers must capture the interest of consumers with good website content since most website visitors make their judgment whether to continue browsing the website based on just a few seconds on the web page. E-vendors and website designers must know their incumbent consumers and provide tailored content and products used by this category of consumers. Good and appealing content (pictures, words, and videos of products) should be made available and easily accessible to secondary (potential) consumers who might need the products in the future.

Furthermore, the built-in website algorithms should provide product recommendations based on previous product searches to enhance consumer enjoyment and satisfaction; the website should be visually attractive and appealing with easy-to-use functionalities. E-vendors must also provide consumers with up-to-date information about products on their websites. The findings of this research also showed that familiarity significantly influences behavioural intention. E-vendors must build their presence with consumers, especially those who have not yet trusted the sites, by exposing more of their image and brand to them. E-vendors should communicate the feedback from incumbent consumers who have experienced their products to potential consumers through their websites' feedback and comment section. Positive feedback can raise consumers' expectations and eventually skew towards making consumers comfortable with the online vendor. More so, the website layout should be designed in such a way that is familiar to consumers.

The findings also indicate that online trust is a significant determiner of the actual use of e-commerce applications. Therefore, it implicates stakeholders and web business designers to build trust with customers. E-vendors and website designers should build a secure online shopping website that makes consumers feel safe when they shop on the site. The perceived level of safety consumers associates with e-commerce websites significantly influences their

trust in the brand. Building a robust social presence is another way that e-vendors can build trust with consumers. E-vendors should build a robust social media platform to increase their brands' visibility, attracting more followers and consumers. An advantage of building visibility via social media is that it exposes the brand to many people who might have a wonderful experience with the online vendor, building online trust. Also, e-vendors should provide helpful and memorable online customer service to build trust with their customers. E-vendors should ensure that their online customers feel heard, appreciated, and happy. Consumers would perceive e-vendors brands as trustworthy if they provide prompt, helpful, and first-class customer service.

This research showed that perceived online security is a significant predictor of the actual use of e-commerce in Ghana. This finding implies that the website must be appropriately secured for customers to put their personal information. E-vendors should let third party processors like Mastercard, Visa, and PayPal handle customer credit and debit card information. These providers have the technical and security strength to handle customers' data better than e-vendors. E-vendors must also educate their consumers on how to safeguard their data. E-vendors should teach consumers how to spot suspicious behaviour from attackers who try to sniff consumers' web traffic to steal their data and inform them if something goes wrong.

7.5 Contributions to the research

This research has made some significant theoretical, methodological, and contextual contributions to e-commerce adoption. These contributions are highlighted in Table 7.1.

Table 7.1 Summary of contributions to the study

Theoretical contributions	Extending the UTAUT model to suggest a new model that can be used as a theoretical lens to investigate e-commerce adoption is the chief contribution of this research. To the best of the author's knowledge, this research is the first of its kind to use the constructs it suggested to investigate e-commerce adoption in a developing country.
Methodological contributions	The exploratory factor analysis was used to test the constructs' validity and reliability in a new research

	context. The constructs' measurement items were adapted from past related studies and refined to achieve the study's objective. Each construct's measurement items were subjected to a rigorous validity and reliability test to achieve the measures' good validity. All constructs showed a good fit with the data and the model. The structural model specification and the measurement model in the structural equation model technique supported the suggested constructs as valid and reliable with the data collected except for the social influence construct.
Contextual contributions	This research advanced the literature of e-commerce adoption by augmenting it with a developing country perspective with data from Ghana. E-commerce adoption research in developing countries has received very little attention in the international business literature with inconsistent and inconclusive findings. Therefore, this research supplements the plethora of advanced country-based studies on e-commerce.

7.6 Limitations and future research directions

This study investigated the factors that influence e-commerce adoption in Ghana. Despite the relevant findings and contributions, this study has some limitations that need to be carefully thought through and be an agenda for future research. First, data were collected in a single country, Ghana; therefore, the research findings can only be directly implied in Ghana. Due to social idiosyncrasies, it is unknown how well the data and the model can be extrapolated to other countries, especially in other developing countries. Thus, there is a need for support of findings by future researchers with data from other countries.

Second, the data analyzed in this study were collected only from users of e-commerce applications; thus, Ghanaians who have bought products from an online shopping website rather than non-users. Therefore, the sample might not have provided a holistic understanding of e-commerce adoption in Ghana. Therefore, it would be necessary for future research to collect data from non-users of e-commerce to investigate their perception of e-

commerce and the factors that may account for adopting e-commerce by non-adopters. Third, the study employed a purposive sampling method of data collection (non-probabilistic approach). This approach may not necessarily capture the populations' view. Future research could investigate the antecedents of e-commerce adoption with a probabilistic data sampling approach. Furthermore, it could be interesting from an interpretative/constructivist standpoint (applying the methodological toolkit available) to better understand why the moderating effect in the case of online security showed an insignificant effect and why it was significant in the case of trust. Future research could conduct qualitative research (e.g. in-depth interview/ focus group discussion) to understand what the coefficients could not show.

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Appendix A

Survey Questionnaire

This questionnaire's bearer is a PhD candidate at the Faculty of Business and Economics at the University of Pecs. This survey aims to assess the determinants of e-commerce adoption in a developing country, focusing on Ghana. Please answer all questions in **ALL** sections. All responses will be used only for the academic purpose it is intended.

Please note:

1) There are **two (2)** sections in this questionnaire.
2) Completion of this form will take you 15-20 minutes.

Section A: Demographic profile

In this section, please fill in some of your details. Please tick your answer.

1) Gender: a. Male b. Female
2) Age:
   a. 18 years or less
   b. 19 years to 29 years
   c. 30 years to 40 years
   d. 41 years and above
3) Educational level:
   a. Senior high
   b. Tertiary
   c. Professional
4) Product purchased online:
   a. Books/Magazines
   b. Clothes/Shoes
   c. Computer accessories
   d. Home appliances
   e. Travel itinerary (airline tickets/reservations)
5) The number of online purchases in a year:
   a. 1–5
   b. 6–10

c. 11–15

d. >15

6) Years of experience with e-commerce:

a. 1–5

b. >5

Section B

Please indicate the extent to which you agree or disagree with each of the following statements. **Keys**

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Performance Expectancy (PEE)

7. This factor measures the degree to which you perceive gains by using e-commerce.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
I find purchasing online useful in my daily life	PEE1	1	2	3	4	5	8	9
E-commerce sites enable me to accomplish my purchases more quickly	PEE2	1	2	3	4	5	8	9
I find e-commerce as a tool that adds value to my transaction process	PEE3	1	2	3	4	5	8	9
Buying from an e-commerce site makes my purchase more convenient	PEE4	1	2	3	4	5	8	9
Overall, I find adopting e-commerce to be advantageous in my online purchases	PEE5	1	2	3	4	5	8	9

Effort Expectancy (EET)

8. This factor measures the degree of ease of use of an e-commerce platform.

Keys

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
Learning to navigate an e-commerce platform is easy for me	EET1	1	2	3	4	5	8	9
My interaction with e-commerce platforms is clear	EET2	1	2	3	4	5	8	9
I find it easy to accomplish my purchases using e-commerce platforms	EET3	1	2	3	4	5	8	9
I find it easy to find what I want on e-commerce platforms	EET4	1	2	3	4	5	8	9

Social Influence (SOCI)

9. This factor measures the degree to which you believe people close to you influence you to use e-commerce.

Keys

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
People who are important to me think I should adopt e-commerce	SOCI1	1	2	3	4	5	8	9
People who influence my behavior influence my adoption of e-commerce	SOCI2	1	2	3	4	5	8	9
Friends suggestions and recommendations influence my use of e-commerce	SOCI3	1	2	3	4	5	8	9
I will use e-commerce because many people around me have adopted it	SOCI4	1	2	3	4	5	8	9
The mass media makes me purchase from e-commerce platforms	SOCI5	1	2	3	4	5	8	9

Facilitating Conditions (FAC)

10. This factor measures the degree of available technical/infrastructural support you have to use e-commerce

Keys

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
I can get help from others when I have difficulties using e-commerce platforms	FAC1	1	2	3	4	5	8	9
I have the resources necessary to use e-commerce	FAC2	1	2	3	4	5	8	9
E-commerce platform is compatible with other technologies I use	FAC3	1	2	3	4	5	8	9
I have the necessary knowledge to use e-commerce	FAC4	1	2	3	4	5	8	9
I have the necessary training to use e-commerce platforms	FAC5	1	2	3	4	5	8	9
The support service for e-commerce is dependable	FAC6	1	2	3	4	5	8	9

Website quality (WSQ)

11. This factor measures the degree to which the quality of e-commerce websites influence your intention to adopt e-commerce.

Keys

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
The website of this seller quickly loads all texts and graphics	WSQ1	1	2	3	4	5	8	9
The website of the seller is easy to use	WSQ2	1	2	3	4	5	8	9
The website of the seller is easy to navigate	WSQ2	1	2	3	4	5	8	9
The website of this seller is visually attractive	WSQ4	1	2	3	4	5	8	9
The website of this seller gives me up-to-date information	WSQ5	1	2	3	4	5	8	9

Familiarity with vendor (FMV)

12. This factor measures the degree to which your familiarity with an online vendor influences your intention to adopt e-commerce.

Keys

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
I am familiar with buying products from the online vendor	FMV1	1	2	3	4	5	8	9
I am familiar with the process of purchasing from online vendors	FMV2	1	2	3	4	5	8	9
I am familiar with buying products from online vendors	FMV3	1	2	3	4	5	8	9
Overall, I am familiar with online vendors	FMV4	1	2	3	4	5	8	9

Behavioral intention (BINT)

13. This factor measures your subjective probability that you would like to engage in using e-commerce.

Keys

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
I intend to continue purchasing products from e-commerce sites in the future	BIN1	1	2	3	4	5	8	9

I will encourage others to purchase from e-commerce sites	BIN2	1	2	3	4	5	8	9
I intend to increase my use of e-commerce when the opportunity comes	BIN3	1	2	3	4	5	8	9
I will always try to use e-commerce in my daily purchasing transactions	BIN4	1	2	3	4	5	8	9
I intend to use e-commerce frequently	BIN5	1	2	3	4	5	8	9

Online security (ONLS)

14. This factor measures the degree to which online buying safety would influence you to use e-commerce.

Keys

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
I think my sensitive information sent to online companies will be accessed by unauthorized parties	ONLS1	1	2	3	4	5	8	9
The web is a secure means through which to send sensitive information	ONLS2	1	2	3	4	5	8	9

I would feel safe to send sensitive information about myself over the web	ONLS3	1	2	3	4	5	8	9
I do not hesitate to make purchases from the web because of security issues of sensitive information	ONLS4	1	2	3	4	5	8	9

Perceived online trust (TRUS)

15. This factor measures the degree to which trust in online systems would influence you to adopt e-commerce.

Keys

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
I find e-commerce sites trustworthy	TRUS1	1	2	3	4	5	8	9
The website vendor gives the impression that it keeps promises and commitments	TRUS2	1	2	3	4	5	8	9
I believe that the website vendor has my interest in mind	TRUS3	1	2	3	4	5	8	9
The website can be trusted to carry out online transactions faithfully	TRUS4	1	2	3	4	5	8	9

Actual use of e-commerce (ACTU)

Keys

(1) = Strongly disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly agree

Please circle the appropriate response.

Questions	Code	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	I do not know	I do not want to answer
I use e-commerce sites frequently for my purchases	ACTU1	1	2	3	4	5	8	9
My purchases are mostly done through e-commerce sites	ACTU2	1	2	3	4	5	8	9
I purchase from e-commerce sites regularly	ACTU3	1	2	3	4	5	8	9
I currently make purchases from e-commerce sites	ACTU4	1	2	3	4	5	8	9

END

Thank you for your participation

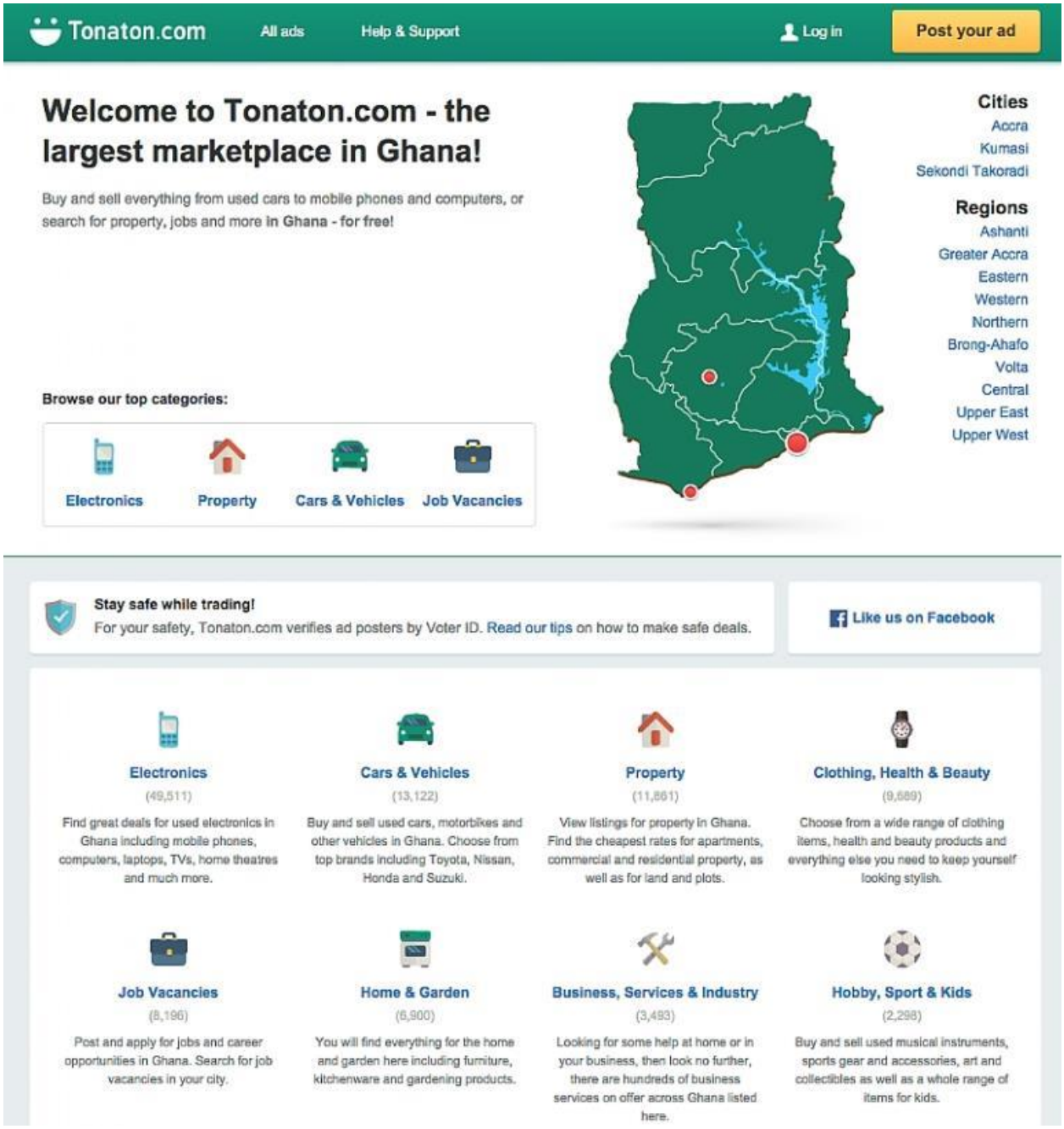
Appendix B

Home page of some selected e-commerce sites in Ghana.

Company name: eShopAfrica.com

Source: eShopAfrica.com

Company name: Tonaton.com

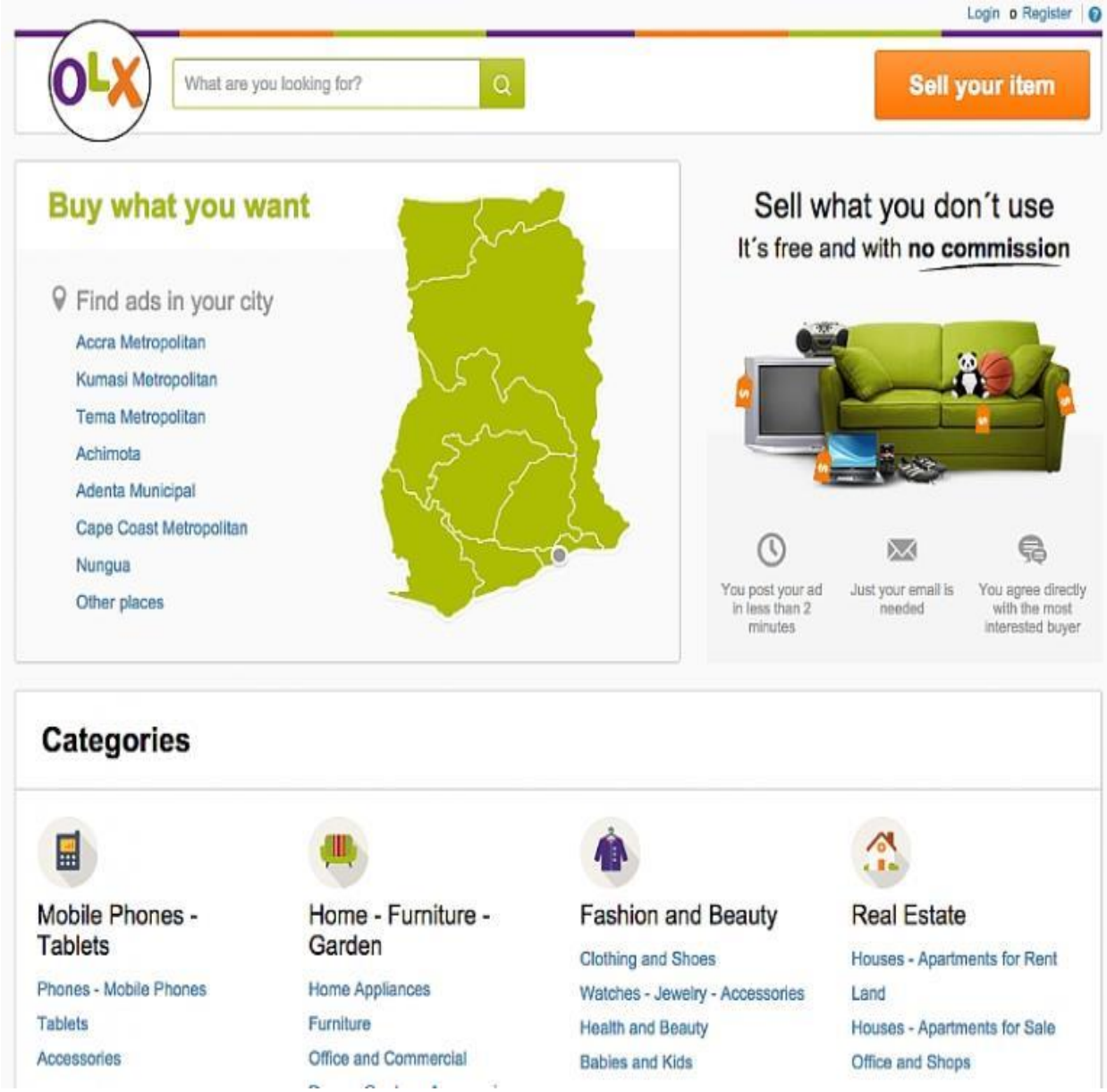


Source: Tonaton.com

Company name: Jumia

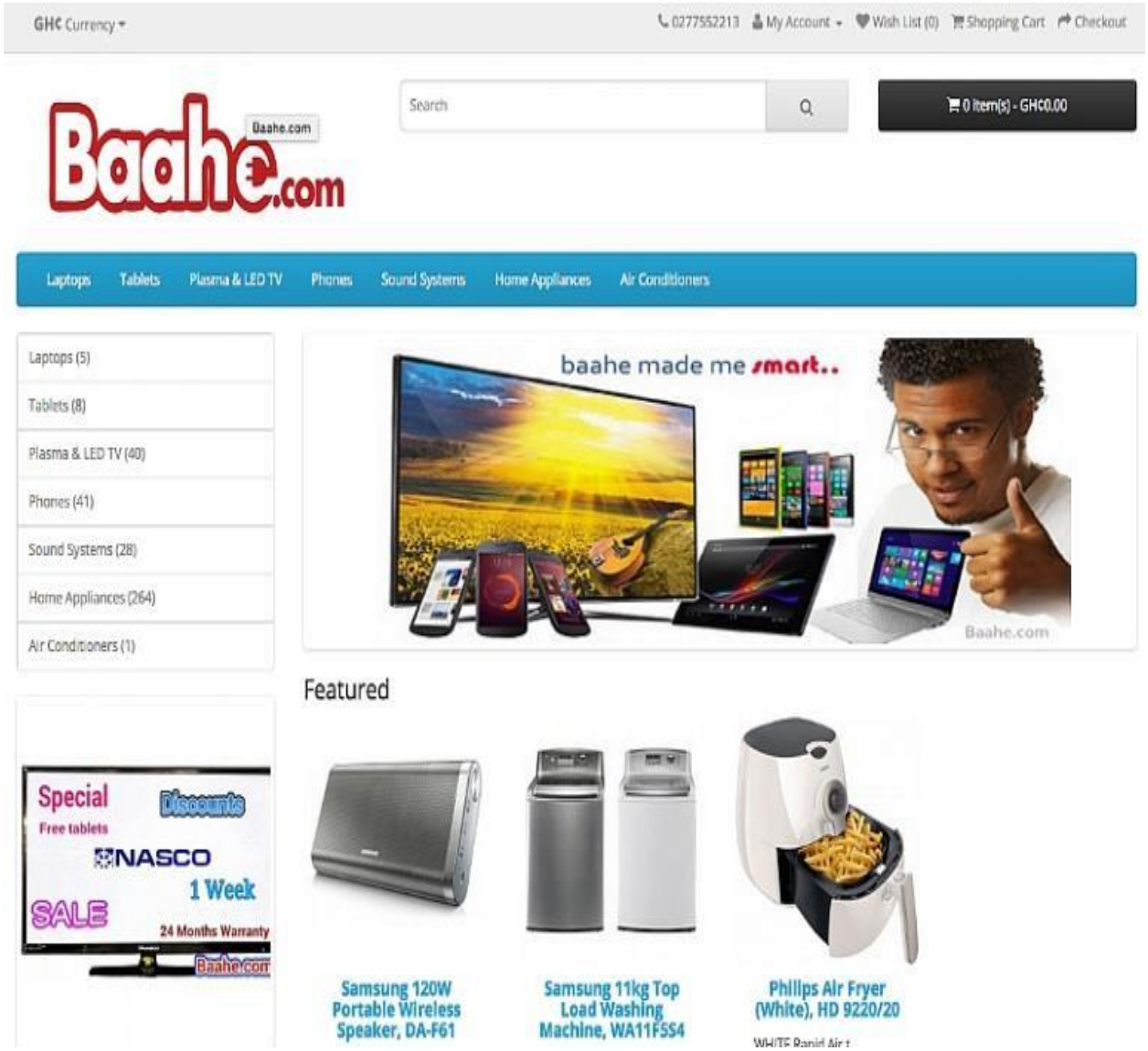
Source: www.jumia.com.gh

Company name: OLX



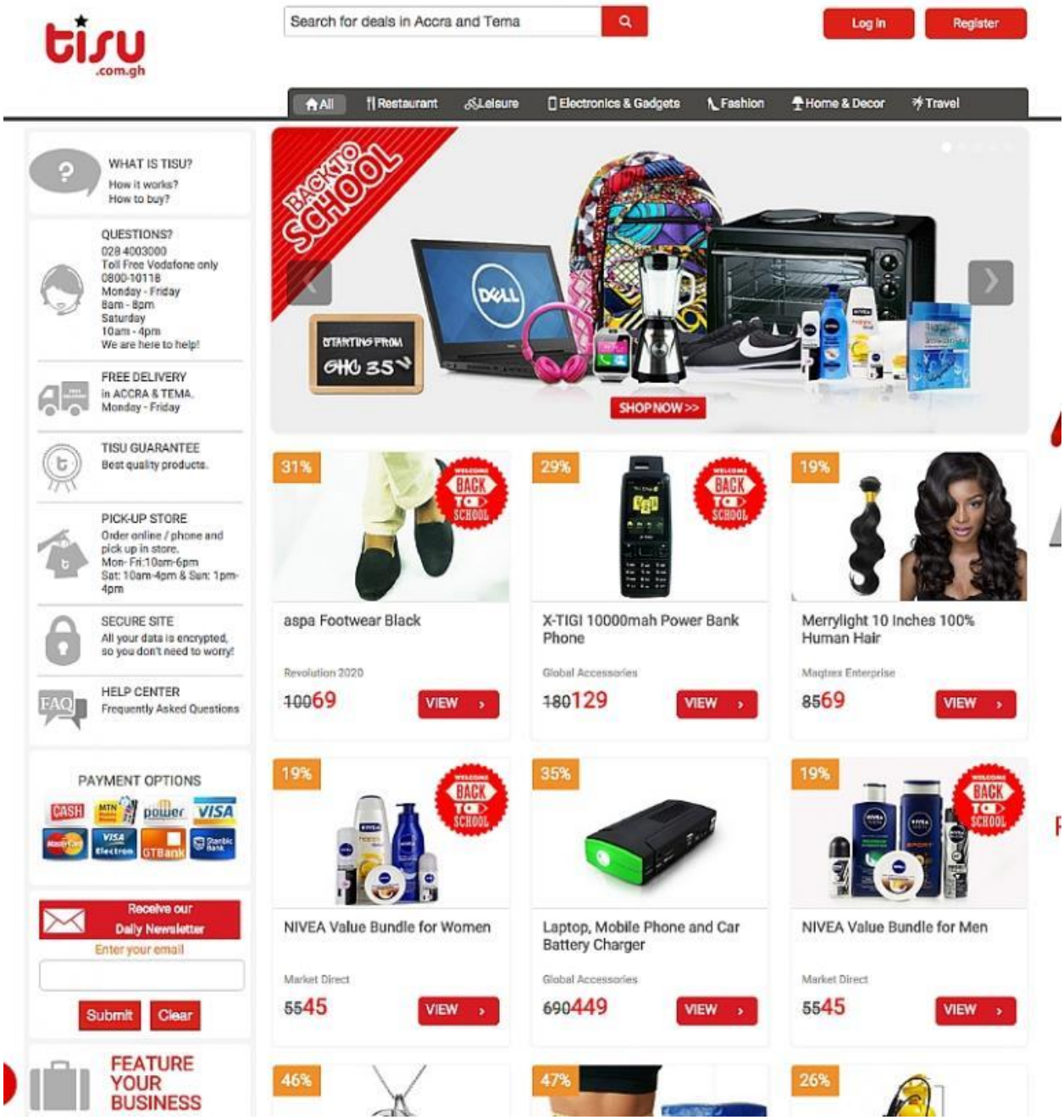
Source: www.olx.com.gh

Company name: Baahe.com



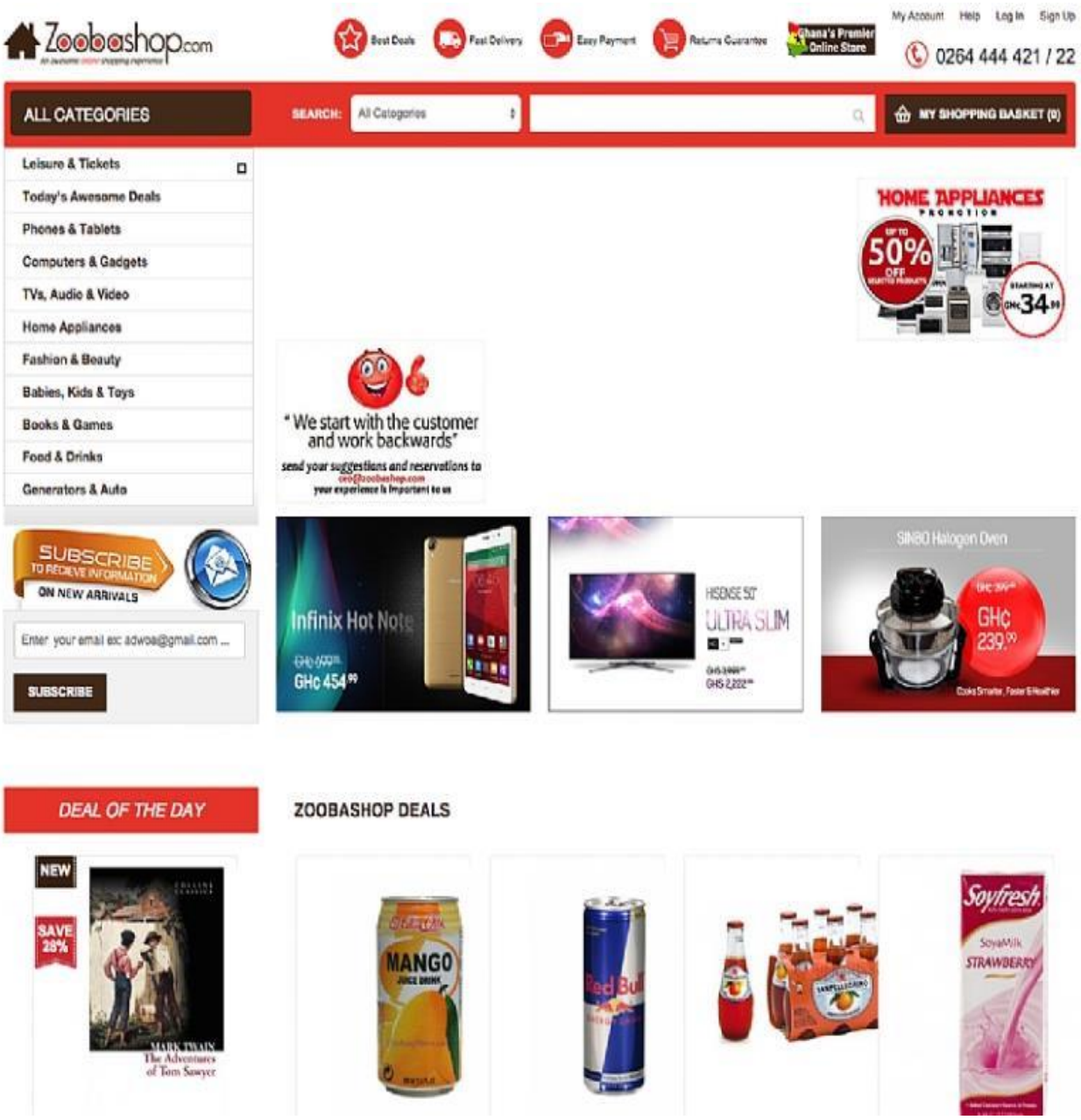
Source: http://baahe.com

Company name: Tisu.com



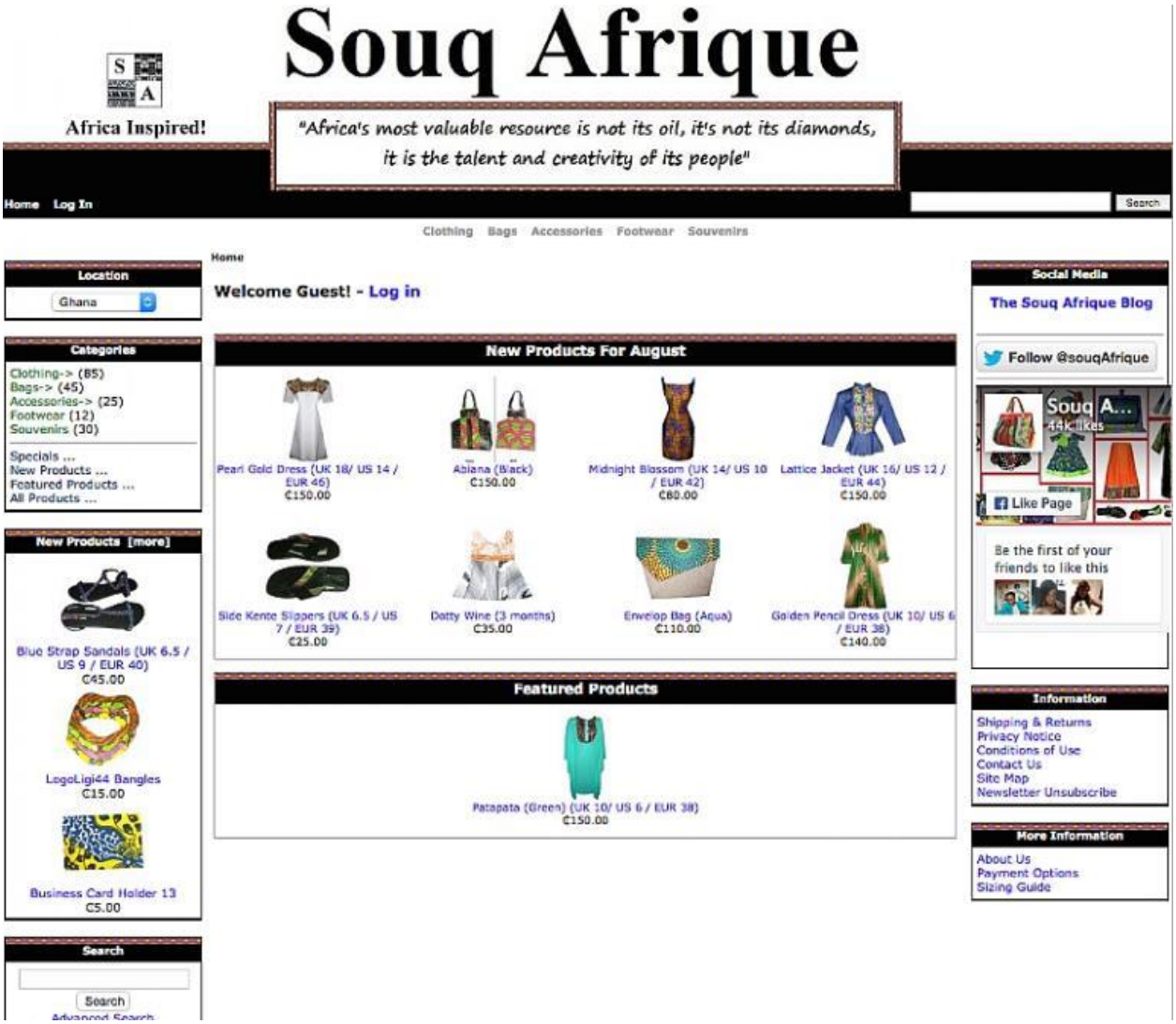
Source: http://www.tisu.com.gh

Company name: Zoobashop.com



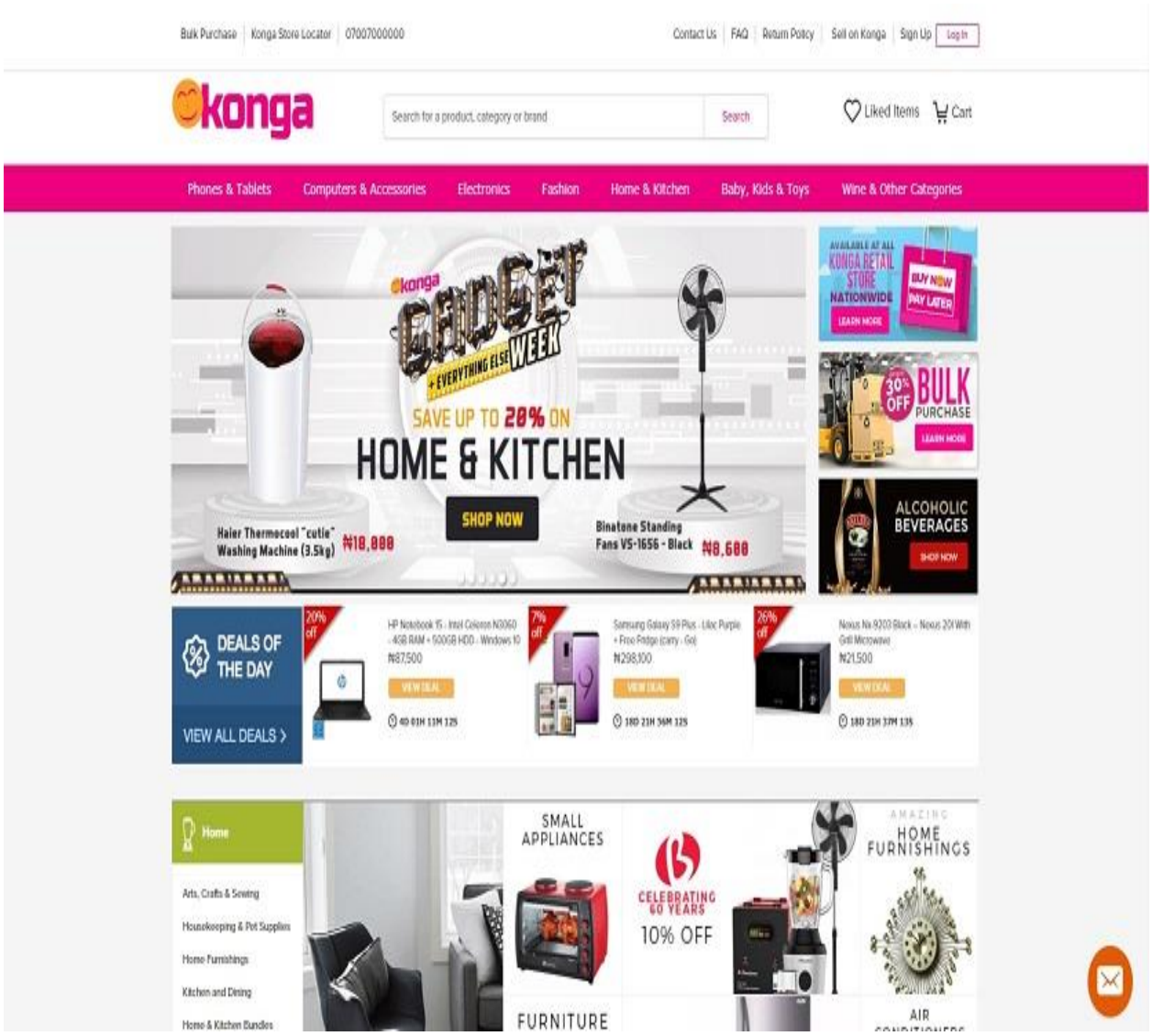
Source:Zoobashop.com

Company name: Souq Afrique



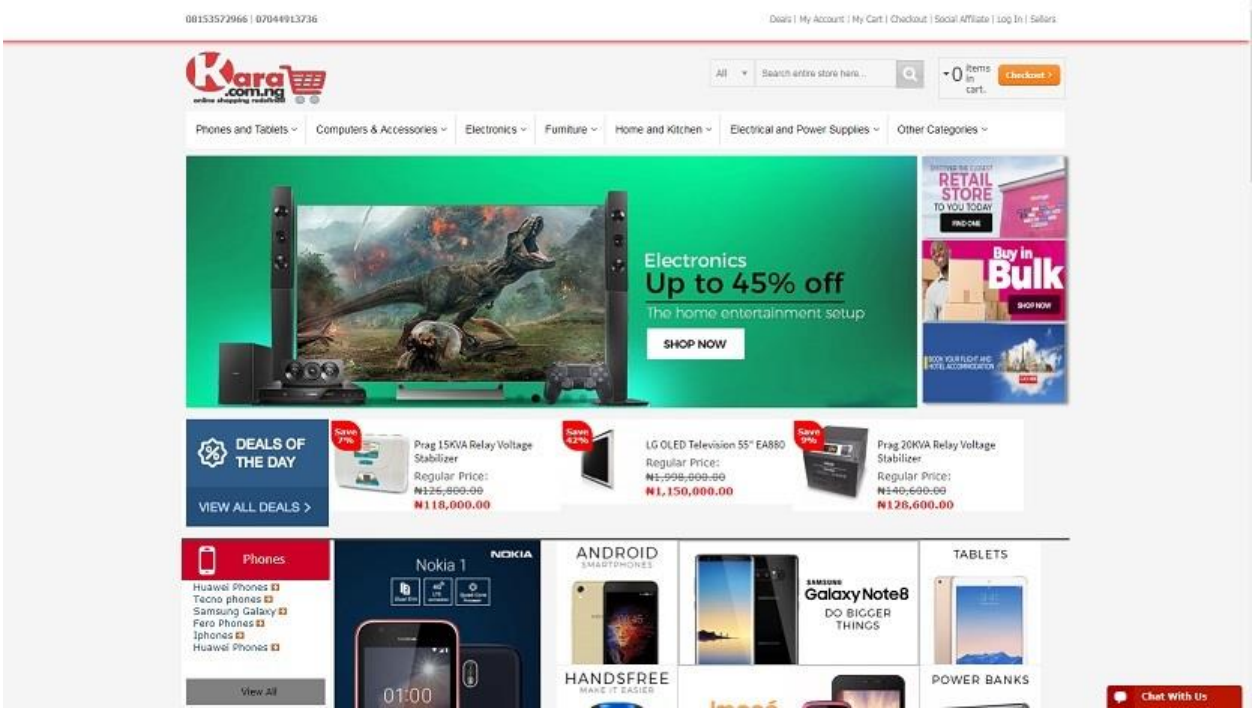
Source: http://store.souqafrique.com

Company name: Konga



Source: https://www.konga.com

Company name: Kara.com



Source: https://www.kara.com.

APPENDIX C

Table 3.1 Models and theories of individual technology acceptance

Theory/Model	Core constructs	Definition
Theory of Reasoned Action (TRA) TRA is one of the fundamental theories that predict human behaviour. Proposed by Fishbein and Ajzen (1975), TRA has been applied to understand and predict human behaviour in various contexts.	Attitude towards behaviour Subjective norms (SN)	"an individual's positive or negative feelings about performing the target behaviour" (Fishbein and Ajzen 1975, p. 216). "the person's perception that most people who are important to him think he should or should not perform the behaviour in question" (Fishbein and Ajzen 1975, p. 302).
Technology Acceptance Model (TAM) TAM was proposed by Davis (1989) to predict individual technology acceptance or rejection. TAM is mainly tailored to the information systems (IS) context.	Perceived Usefulness (PU) Perceived ease of use Subjective norms (SN)	"the degree to which an individual believes that using a particular system would enhance his job performance" (Davis 1989, p.320). "the degree to which an individual believes that using a particular system would be free from effort" (Davis 1989, p.320). Adapted from TRA.

Motivational Model (MM) MM has been supported as a theory that provides an understanding of human behaviour. For example, Davies et al. (1992) used MM theory to explain the adoption of new technology.	Extrinsic motivation Intrinsic motivation	The perception is that users will want to perform an activity "because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions" (Davis et al. 1992, p., 1112). The perception is that users will want to perform an activity "for no apparent reinforcement other than the process of performing the activity per se" (Davis et al. 1992, p. 1112).
Theory of Planned Behavior (TPB) TPB was proposed by Ajzen (1991) as an extension of TRA by introducing perceived behavioural control.	Attitude towards behaviour Subjective norms Perceived behavioural control (PBC)	Adapted from TRA Adapted from TRA "the perceived ease or difficulty of performing the behaviour" (Ajzen 1991, p.188).
Combined TAM and TPB (C-TAM-TPB) This model integrates TPB factors with TAM's perceived usefulness to prove a hybrid model (Taylor & Todd, 1995a).	Attitude Subjective norms Perceived behavioural control (PBC)	Adapted from TRA/TPB Adapted from TRA/TPB Adapted from TRA/TPB

	Perceived usefulness	Adapted from TAM
Model of PC Utilisation (MPCU) MPCU was used by Thompson et al. (1991) to predict PC utilisation. The nature of the model makes it suitable to understand and predict technology acceptance	Job fit	"the extent to which an individual believes that using (a technology) can enhance the performance of his or her job" (Thompson et al., 1991, p. 129).
	Complexity	"the degree to which an innovation is perceived as relatively difficult to understand and use" (Thompson et al., 1991, p. 128).
	Long term	"Outcomes that have a pay-off in the future" (Thompson et al., 1991, p. 129).
	Affect towards use	"feelings of joy, elations, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act" (Thompson et al., 1991, p. 127).
	Social factors	"the individual's internalisation of the reference group's subjective culture, and specific interpersonal agreement that the individual has made within others, in specific social situations" (Thompson et al., 1991, p. 126)
	Facilitating conditions	These are factors that make it easy to accomplish a task. For

		example, online purchase is facilitated when 24hour support is available to consumers who encounter some difficulties when using the e-commerce platform. "provision of support to users of PCs may be one type of facilitating condition that can influence system utilisation" (Thompson et al., 1991, p. 129).
Social Cognitive Theory (SCT) SCT was proposed by Bandura (1986), and it has been used by Venkatesh et al. (2003) to understand individual technology acceptance	Outcome expectation performance Self-efficacy Affect Anxiety	Performance on expected job outcome (Compeau & Higgins, 1995b). The judgment of one's ability to use a technology (e.g., computer) to accomplish a particular job or task. An individual's emotional attachment to a particular behaviour (e.g., using an app). Evoking anxious or emotional reactions when performing a behaviour (e.g., using an app).
Innovation Diffusion Theory (IDT)	Relative advantage Ease of use	"the degree to which an innovation is perceived as better than its precursors" (Moore & Benbasat, 1991, p. 195). "the degree to which an innovation is perceived as easy to use" (Moore & Benbasat, 1991, p. 195).

	Image	"the degree to which the use of an innovation is perceived to enhance one's image or status in one's social system" (Moore & Benbasat, 1991, p. 195).
	Visibility	"the degree to which one can see others using the system in the organisation" (Moore & Benbasat, 1991)
	Compatibility	"the degree to which an innovation is perceived as being consistent with the existing values, needs, and experience of potential adopters" (Moore & Benbasat, 1991, p. 195).
	Results demonstration	"the tangibility of the results of using the innovation, including their observability and communicability" (Moore & Benbasat, 1991, p. 203).
	Voluntariness of use	"the degree to which the use of the innovation is perceived as voluntary, or of free will" (Moore & Benbasat, 1991, p. 195).

Source: Venkatesh et al. (2003)