NOVA IMS Information Management School

DOCTORAL PROGRAMME

Information Management

Specialization in Information Technologies

Mobile Payment Continuance Intention

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A thesis submitted in partial fulfillment of the requirements for the degree of Doctor in Information Management

November 2021

NOVA Information Management School
Universidade Nova de Lisboa

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Abstract

The disruptive development of information and communication technologies over the last two decades has revolutionized the mobile phone industry, exponentially increased the number of mobile phone users, and encouraged companies to make various services available through a mobile phone. Mobile payment is one of the fastest growing services, enabling users to perform financial transactions over a mobile phone. The exponential growth of mobile payment has affected a number of sectors including finance and technology, thus reinforcing the need for a deep understanding of the impact of the continued use of mobile payment services. With this dissertation we contribute to a better understanding of the determinants of continuance intention to use mobile payment at the individual level. For this reason, were developed four studies, one literature review, and three empirical studies.

In the first study (Chapter 2) we conducted a literature review of existing studies on individual continuance intention to use an information system. In Chapter 3 we assessed the continuance intention to use m-payment employing two theoretical models, the DeLone and McLean information system success model (D&M ISSM) and the expectation-confirmation model (ECM) in an African context. The impact of task technology fit (TTF) and overall trust on ECM to explain the continuance use of m-payment is analysed in Chapter 4. In the last study, Chapter 5, we assess the impact of culture on continuance intention to use m-payment, combining the ECM and Hofstede's cultural dimensions.

This dissertation provides several contributions for research and practice, contributing to the advancement of knowledge and implications for service managers, service providers, users, and researchers. The literature review applies meta-analysis and weight analysis from 115 empirical studies from continuance intention to use an information system (IS). The findings reveal that the factors with strongest influence on continuance intention to use an IS are affective commitment, attitude, satisfaction, hedonic value, and flow. Moreover, sample size, individualism, uncertainty avoidance, and long-term orientation moderate the relationship of perceived usefulness on continuance intention. Power distance, masculinity, and indulgence moderate the

relationship of satisfaction on continuance intention. From the first empirical study we examine the influence individual performance drivers on continuance intention to use m–payment in an African context. We find that the most important predictors of continuance intention to use m-payment are individual performance, use, and satisfaction. The second empirical study integrates TTF and overall trust theories and evaluates their relationships for continuance intention to use mobile payment. Findings show that use, individual performance, overall trust, and the moderation role of satisfaction are the most important constructs to explain continuance intention. The last empirical study assesses the impact of culture on m-payment continuance intention. The findings reveal that the relationships between confirmation on satisfaction and perceived usefulness, and perceived usefulness on continuance intention are moderated by uncertainty avoidance.

Keywords: Mobile payment, continuance intention, ECM, D&M ISSM, TTF, trust, culture, African context.

Resumo

O desenvolvimento disruptivo das tecnologias de informação e comunicação nas últimas duas décadas revolucionou a indústria da telefonia móvel, aumentando exponencialmente o número de utilizadores de telemóveis, encorajando desta forma as empresas a disponibilizar diferentes serviços através de um telemóvel. O serviço pagamento móvel é um dos serviços que se encontra em um rápido crescimento permitindo aos utilizadores efetuar transações financeiras através de um telemóvel. O crescimento exponencial do serviço de pagamento móvel tem afetado diferentes sectores, tais como finanças e tecnologia, reforçando a necessidade de uma compreensão profunda do impacto da utilização contínua dos serviços de pagamento móvel. Com o desenvolvimento desta dissertação, esperamos contribuir para uma melhor compreensão dos determinantes da intenção de continuar a usar o serviço de pagamento móvel a nível individual. De forma a concretizar este objetivo foram desenvolvidos um total de quatro estudos distintos.

No primeiro estudo (Capítulo 2) realizámos uma revisão bibliográfica dos estudos existentes sobre a intenção de continuar a utilizar um sistema de informação. No capítulo três, avaliámos a intenção de continuar a utilizar o serviço de pagamento móvel, empregando dois modelos teóricos, o *DeLone and McLean information system success model* (D&M ISSM) e o *expectation-confirmation model* (ECM) num contexto africano. O impacto do *task technology fit* (TTF) e o *overall trust* no modelo ECM para explicar o uso contínuo do serviço de pagamento móvel foi analisado no capítulo quatro. No último estudo, capítulo cinco, avaliámos o impacto da cultura na intenção de continuação da utilização do serviço de pagamento móvel, combinando as dimensões culturais de Hofstede e o modelo ECM.

Esta dissertação apresenta várias contribuições para a investigação e para a prática, contribuindo para o avanço do conhecimento, provocando implicações para gestores de serviços, prestadores de serviços, utilizadores e investigadores. O estudo da revisão bibliográfica aplicou *meta-analysis* e *weight analysis* a partir de 115 estudos empíricos de intenção continuar a utilizar um sistema de informação (SI). Os resultados revelam que os fatores com maior influência na intenção de continuação da utilização de um SI foram o compromisso afetivo, atitude, satisfação, valor hedónico, e *flow*. Além disso,

o tamanho da amostra, individualismo, prevenção da incerteza, e orientação a longo prazo moderam a relação entre perceção da utilidade e intenção de continuar, distância do poder, masculinidade e indulgência moderam a relação entre satisfação e intenção de continuar. Para o primeiro estudo empírico, examinámos a influência dos fatores de desempenho individual na intenção de continuação da utilização do m-pagamento num contexto africano. Verificámos que os preditores mais importantes da intenção de continuar a utilizar o serviço de pagamento móvel são o desempenho individual, uso e a satisfação. O segundo estudo empírico integrou as teorias da TTF e da confiança geral e avaliou as suas relações para a intenção de continuação da utilização do pagamento móvel. Os resultados mostram que o uso, desempenho individual, confiança geral, o papel de moderação da satisfação são os fatores relevantes para explicar a intenção de continuar a utilizar o serviço de pagamento móvel. O último estudo empírico avalia o impacto da cultura sobre a intenção de continuação do pagamento móvel. Os resultados revelam que as relações entre confirmação, perceção de utilidade com satisfação, perceção de utilidade com intenção de continuar são moderadas pela prevenção da incerteza.

Palavras-chave: Pagamento móvel, intenção de continuar, ECM, D&M ISSM, TTF, Confiança, Cultura, contexto africano.

Publications

List of studies resulting from the dissertation.

Papers (published):

Franque, F.B., Oliveira, T., Tam, C. and Santini, F.d.O. (2021), "A meta-analysis of the quantitative studies in continuance intention to use an information system", Internet Research, 31(1), 123-158. https://doi.org/10.1108/INTR-03-2019-0103

Franque, F. B., Oliveira, T., & Tam, C. (2021). Understanding the factors of mobile payment continuance intention: empirical test in an African context. Heliyon, 7(8). https://doi.org/10.1016/j.heliyon.2021.e07807

Papers (under review or submitted)

Franque, F. B., Oliveira, T., & Tam, C. (2021). Continuance intention of mobile payment: TTF model with Trust in an African context.

Franque, F. B., Oliveira, T., & Tam, C. (2021). Role of the uncertainty avoidance culture on the expectation confirmation model: Mobile payment case.

Acknowledgements

To my family, especially my father, Gilberto Franque, and to all my brothers, who encouraged me from the beginning to pursue a PhD, and for their inexhaustible support for this journey, mainly emotional support, bearing in mind that my family is in Mozambique, in Tete city.

To Prof. Tiago Oliveira, supervisor of this dissertation, for being always available, for all the help, support, guidance, and ideas that significantly contributed to the success of the journey. A huge thanks for everything.

To Prof. Carlos Tam, co-supervisor of this dissertation, for being always available, for all the help, support, guidance, and ideas that significantly contributed to the success of the journey. A huge thanks for everything.

To Prof. Fernando de Oliveira Santini for all the help, suggestions, and critiques, which contributed to the enrichment of Chapter 2.

To Nova Information Management School, for the opportunity given to participate in the PhD program.

To Engineering School, Catholic University of Mozambique, for the opportunity given to go to Lisbon to participate in the PhD program.

To the new friends from Lisbon, for the good moments of fun, that helped a lot for the success of the journey.

To my girlfriend, Gisela Manhique, who helped me tremendously in the discussions and translation from Portuguese to English of the different studies. A big thanks for everything.

To me, for the courage to go to a completely new country, with new challenges, for the tireless effort during the five years of the journey.

To all my sincere thanks.

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Chapter 1 – Introduction

1.1. Motivation

Mobile phone networks are booming and almost all are interconnected, making people able to communicate and share information anywhere in the world. Associated with this, mobile phone usage is growing exponentially, motivating companies to deliver services via mobile phones (Karjaluoto et al., 2019; Persaud & Azhar, 2012). Taking into consideration that it can be used anywhere and anytime, adding more value to services, new services are being made available via mobile phones, such as m-banking, m-payment, and m-commerce, thereby bringing customers closer to companies and strengthening their relationship (Oliveira et al., 2016).

In our work we study Mobile payment (m-payment). M–payment is a payment method that uses mobile phones to make financial transactions such as paying for goods or services, transferring money, and/or withdrawing money (Fan, Shao, Li, & Huang, 2018; Zhou, 2013). Whereas in some regions financial institutions are far from the population, forcing people to travel long distances to use financial services, m-payment has become one of the prominent services (Gao & Waechter, 2015; Zhou, 2014), enabling users to make transactions anytime and anywhere (Lu, Wei, Yu, & Liu, 2017; Zhou, 2014).

Society has undergone a disruptive revolution with the entrance of this technology, which affects payment ecosystems. This service is growing exponentially all over the world and is bringing benefits to users and providers. Considering its benefits, companies realize its potential, and are providing it in different ways all over the world (Fan et al., 2018; Singh, Sinha, & Liébana-cabanillas, 2020).

M-payment technology originated in the United States and spread throughout the world (Fan et al., 2018). In Africa, this technology was launched in Kenya and was quickly adopted by other countries. Mozambique is one of the African countries that has adopted this technology, helping rural people who do not have banking infrastructure near their homes (Batista & Vicente, 2018). M-payment has a major impact on developing countries as it launches basic financial services such as money transfer, payment of goods and services, and/or withdrawing money, thereby improving people's lives (Humbani & Wiese, 2018).

A great deal of research has been developed to understand m-payment in different regions (e.g., Chen & Li, 2017; Oliveira, Thomas, Baptista, & Campos, 2016; Sinha, Majra, Hutchins, & Saxena, 2019). However, there are few studies to understand m-payment in an African context (e.g., Chen & Li, 2017; Lin, Featherman, & Sarker, 2017). According to Nabavi et al. (2016) and Shaikh and Karjaluoto (2015) no studies about information system continuance intention were found in the African context. For Bhattacherjee, (2001) the early stage of information systems (IS) adoption is a vital step toward the success of IS, but permanent usage of IS and its success is associated with continued use instead of first usage. In this sense, understanding what factors influence an individual to continue using m-payment has become necessary and important for researchers and companies (Bhattacherjee, 2001; Shaikh & Karjaluoto, 2015). It is thus extremely important to understand the most important drivers that influence continuous use of mobile payment in an African context.

1.2. Continuance intention models

Studies on information system continuance intention (ISCI) have used a wide range of theories in combination with the expectation-confirmation model (ECM) (Bhattacherjee, 2001) such as expectation-confirmation theory (ECT) (Oliver, 1986), technology acceptance model (TAM) (Davis, 1989), unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003), and Flow theory (Getzels & Csikszentmihalyi, 1978), to name a few. However, continuance intention of IS refers to factors that contribute to IS usage for a long time. It involves understanding the long-term factors that contribute to the success of the IS (A. Bhattacherjee, 2001; K. Wang, 2015).

In the context of ISCI, ECM was the first theory proposed by (Bhattacherjee, 2001). ECM proposes that satisfaction to use IS is a crucial factor that impacts continuance intention, followed by perceived usefulness of the IS. Also, confirmation of the expectations and perceived usefulness are important factors that influence user satisfaction. After ECM appeared many researchers tested and joined it with other models in different regions and with distinct technologies (Carillo, Scornavacca, & Za, 2017; Hadji & Degoulet, 2016; Hong, Tai, Hwang, Kuo, & Chen, 2017b; Hsiao, Chang,

& Tang, 2016; Zheng, 2019). Most studies used ECM as a base theory. Some used ECM alone (Alraimi et al., 2015; Susanto et al., 2016), and others integrated it with other theories and self-constructs (Chen et al., 2013; Lee, 2010; Limayem & Cheung, 2008). In our work we integrate ECM with DeLone & McLean information system success (D&M ISSM) (DeLone & Mclean, 2003), Task Technology Fit (Goodhue & Thompson, 1995), overall trust (Oliveira et al., 2017), and culture (Hofstede, 1984).

1.3. Research focus

Mobile payment services are today becoming more useful and more present in people's daily lives, especially now with the COVID-19 pandemic. Conducting transactions through a mobile phone is already a reality in people's lives. Understanding the main factors that affect the intention to continue using m-payment is the focus of this dissertation. IS related areas such as e-learning, internet banking, and e-commerce are not within the scope of this work. The study addresses only the individual level of continuance intention.

M-payment is defined as a payment method in which a mobile phone is used to perform financial value exchanges (initiate, authorize, and confirm) anytime and anywhere in return for goods and services (Kujala et al., 2017; Liébana-cabanillas et al., 2018; Shao et al., 2019). There are different ways to conduct a transaction using m-payment. The simplest way is short-message-based, by which the user can make payments using a simple mobile phone (Singh et al., 2020; T. Zhou, 2013).

1.4. Main objectives

To understand the most important factors of the intention to continue using m-payment, we divide our work into different studies, each presented in separate chapters.

The first study (Chapter 2) addresses weight and meta-analysis of ISCI. This study synthesizes the results of previous studies on ISCI, identifying the most used significant relationships in the literature, and the most studied regions and technologies, thus contributing to the state-of-the-art.

In Chapter 3 we analyse the impact of individual performance for the purpose of continuing to use m-payment. We integrate D&M ISSM and ECM in an African context.

In Chapter 4 we analyse the impact of task and technology characteristics, overall trust, and the role of satisfaction as a moderator on continuance intention to use m-payment, considering that trust is an important factor that can influence the usage of m-payment. As financial transactions are sensitive, it is important to have trust in the system.

In Chapter 5 the role of culture in the ECM model is assessed, considering that culture can be an important factor in the adoption and intention to continue using m-payment. Our motivation is to understand the impact of culture as a moderator on the ECM model.

In Chapter 6 we present a summary of the studies, their implications, and recommendations for future studies.

1.5. Methods

According to the literature, there are three main epistemological perspectives (positivism, interpretivism, and realism). In this dissertation we follow the positivism perspective (Smith, 2006). Several methods were applied in this research because we developed a new and different model based on existing theories to understand continuance intention to use mobile payment. The development of the theories was followed by tests in order to explain the subject. A set of hypotheses were developed and empirically tested.

1.5.1. Theoretical frameworks

The ECM (Bhattacherjee, 2001) is used in all the empirical studies, from Chapters 3 to 5. Chapter 3 is based on ECM combined with D&M ISSM. Chapter 4 is based on the integration of ECM, TTF, and overall trust, and Chapter 5 is based on ECM integrated with the cultural moderator (Hofstede, 1984).

1.5.2. Quantitative research methods

In all of the studies we use a cross-section online survey design to analyse the main factors of mobile payment continuance intention. The data collection was conducted in Mozambique. In Chapter 3 we describe the collection of 338 valid responses, in Chapter 4 we examine a sample of 384, and in Chapter 5 apply a mixed-methods approach based on 384 valid responses triangulated with field interviews. The data were collected from July 2018 to January 2019. Structure equation modelling (SEM) was used to empirically test the research models. We used PLS-SEM (partial least squares – structural equation modelling) via Smart PLS 3 software (Ringle et al., 2015).

1.6. Path of research

This dissertation reports the collection of different interrelated studies on the intention to continue using m-payment, presented separately in different chapters. Some of the studies are already published in international journals with a double-blinded review process; others are submitted for publication and are in different stages of review and preparation. The stage of each study is presented in the Table 1.1. The major conclusions of the studies made from Chapter 2 to 5 are presented at the end of the dissertation.

Table 1.1 - Research studies stages

Chapter	Study name	Journal	Current stage
2	A Meta-analysis of the quantitative studies in continuance intention to use an information system	Internet Research	Published
3	Understanding the factors of continuance intention to use mobile payment: Empirical test of the D&M IS success with ECM in the African context	Heliyon	Published
4	Continuance intention of mobile payment: TTF model with Trust in an African context	Submitted to a journal of quartile one of Scimago index	Under review

5	Role of the uncertainty avoidance culture on the expectation confirmation model: mobile payment case	Submitted to a journal of quartile one of Scimago index	Submitted

Chapter 2 – A meta-analysis of the quantitative studies in continuance intention to use information systems

2.1. Introduction

The evolution of information systems (IS) has offered the opportunity to different types of institutions to advance the capability, efficiency, and responsibility of their services and products, thereby streamlining the day to day activities of their customers (Laukkanen 2007). Its use is growing exponentially, considering the usefulness of IS in society. However, the adoption of IS is not enough to keep them in the market, continuous use is necessary (Bhattacherjee, 2001), to bring a return on the investments that companies make, and to help the users in their activities. Continuous use of IS refers to the decision of the user to continue to use the IS. This behaviour is noted after the user has the first experience with IS. Understanding what factors influence an individual to continue to use IS has become necessary for researchers and companies (A Bhattacherjee, 2001; Shaikh & Karjaluoto, 2015). In recent years, the number of studies in continuance intention to use an IS has grown rampantly and now covers several subjects such as continuance intention in mobile banking services, mobile payment, e-learning, social networking, health applications, e-government, mobile commerce, among others. Considering that the number of studies is growing, different technologies, theories and contexts are being studied, there is plenty of scattered information and different results. With that much information in the background, the process of searching for studies became more difficult, and the need for comprehensive and synthesised information about IS continuance intention became essential.

Therefore, it is crucial and necessary to highlight, summarise and clarify the results of existing studies in order to provide a comprehensive picture of continuing to use IS (Fettke, 2006). This process enables theory development and reveals new relationships and gaps (Hamari & Keronen, 2017). There are some literature reviews on IS continuous intention (e.g., Bhattacherjee and Barfar, 2011; Shaikh and Karjaluoto, 2015; Nabavi *et al.*, 2016), that explore different aspects of prior studies such as theories, technologies, and used contexts. However, most of them are narrative and descriptive; none of them has used meta-analysis. This study will use meta- and weight

analysis to derive for more empirical results. The meta-analysis is a process of summarising, evaluating, and analysing quantitative research findings (L. Zhang et al., 2012), even if the outcome is non-significant or inconsistent, it can contributes to a pooled conclusion, reinforcing the general validity of the interpretations (Hamari & Keronen, 2017; K. Wu et al., 2011). According to earlier research meta-analysis and weight analysis are considered appropriate methods to review empirical data (Baptista & Oliveira, 2016; Rana et al., 2015; Schmidt & Hunter, 2016; Y. Zhao et al., 2018). We describe the most critical variables in the field, using findings reported in existing research combined with weight analysis of the constructs to identify the best predictors (Y. Zhao et al., 2018) to highlight the best predictors of continuance intention to use an IS, improvements of theories, and the strength of the variables.

According to our knowledge, no research addresses: (i) meta-analysis combined with weight analysis in the context of continuance intention to use an IS, or (ii) temporal analysis to understand the evolution of the theoretical models over time. This study can extrapolate broader theoretical implications relating to the positioning and understanding of IS. Contributing to the research, we illustrate the most used relationships, best predictors, most used technologies during a period, the evolution of the number of papers per year, and the evolution of the theoretical model. The overall variables to be used to predict continuance intention to use an IS were illustrated. Beyond synthesising the main findings of the studies, we also created models to understand the temporal evolution of the constructs better. Additionally, we analysed possible moderators in the relationship between perceived usefulness and satisfaction on continuance intention to use IS.

The article is organised as follows: in Section 2, is presented the literature review, Section 3 describes the research methodology; in the next section, we present the results of the research followed by a discussion of the findings; the conclusion and future recommendations follow this section.

2.2. Information system continuance intention (ISCI) background

Continuance intention of IS refers to factors that contribute to IS usage for a long time. It involves understanding the long-term factors that contribute to the success of the IS (A Bhattacherjee, 2001; X. Lin et al., 2017; K. Wang, 2015). The first ISCI model was developed by Bhattacherjee, (2001), who proposed that (1) confirmation of the expectations positively influences perceived usefulness and user satisfaction. (2) Perceived usefulness positively influences user satisfaction and continuance intention to use an IS, and (3) user satisfaction positively influences continuance intention to use an IS. Additionally, after Bhattacherjee, (2001) proposed the expectation-confirmation model (ECM), it has been extensively tested in several studies and confirmed that it is a robust model to explain ISCI (Carillo et al., 2017; Hadji and Degoulet, 2016; Hong et al., 2017a; Hsiao et al., 2016; Zheng, 2019). Thereby, many of the early studies used ECM as a base model, and integrated other theories to study different technologies. Susanto et al., (2016) used it to explain smartphone banking services. Lee (2010) applied it to explain e-learning. Alraimi et al., (2015) used it to explain MOOCs. Gao et al., (2015) used it to explain mobile purchases.

Prior studies have conducted literature reviews in the context of IS. However, most of these studies have explored and summarised the literature on a specific IS such as Zolotov et al., (2018) in e-participation, Shaikh and Karjaluoto, (2015) in m-banking, Bayramusta and Nasir, (2016) in cloud computing, Albuquerque et al., (2016) in m-payment. Therefore, in the context of ISCI, we found some reviews that address several issues around ISCI such as theories used, scientific journals published, technologies used, regions studied, number of publications per year, among others (A. Bhattacherjee & Barfar, 2011; Nabavi et al., 2016; Shaikh & Karjaluoto, 2015). However, none of the studies used meta-analysis in the context of ISCI, thus, becoming essential to review empirical data to bring more insights to the literature (Frohberg et al., 2009). A literature review is a process of summarising and highlighting research results. There are different types of review, such as narrative reviews, literature reviews, meta-analysis, to name a few. A narrative review is broader than a literature review, and meta-analysis is more empirical than a literature review (Frohberg et al., 2009; Shaikh & Karjaluoto, 2015).

Despite finding some qualitative reviews that addressed several issues of ISCI (A. Bhattacherjee & Barfar, 2011; Nabavi et al., 2016; Shaikh & Karjaluoto, 2015), and the relevant contribution of qualitative studies, the results did not exhibit conclusive and generalised findings as meta-analytic studies promote (Schmidt. & Hunter, 2004). In the literature review conducted by Bhattacherjee and Barfar, (2011), the purpose was to align the misunderstanding of the concepts, and theory concerning ISCI and extend the theoretical model. The analysis range was ten years, and they found 15 empirical articles. They identified studies that had used acceptance theories such as technology acceptance model (TAM) or unified theory of acceptance and use of technology (UTAUT), to predict continuance intention. Thus, the authors suggest that this practice may be inconsistent and inappropriate to predict ISCI. They also verified that many studies employed a cross-sectional design, and few used a longitudinal research design. Considering that ISCI is a temporal phenomenon, the authors suggest that future studies consider a longitudinal design.

Shaikh and Karjaluoto (2015) conducted a literature review on IS technology/usage. The range of analysis was 15 years, counting 152 studies. In this study, the scope was to synthesise and segregate the major domains of ISCI according to nature and usage. The primary findings of the study were that 75% of the studies predicted continuance intention to use IT/S as a proxy for actual use. They found that 58% of the studies on IT/S were published from 2010 to 2014. 61% of the articles were found in ScienceDirect and Wiley scholarly databases. The authors classified the IT/S into four domains: Continuous Usage of Mobile Information Systems, Continuous Usage of Electronic Business Information Systems, Continuous Usage of Social Information Systems, and Continuous Usage of Electronic Learning Information Systems. Computers in Human Behaviour, Information Systems Journal, and Information and Management were identified as the publications that disseminated more articles on ISCI. Most of the studies were conducted in East Asia, followed by North America. No studies were conducted in Africa. Finally, ECM was the most used theoretical model, and most of the studies used quantitative research.

Nabavi et al., (2016) conducted a systematic review of 191 papers in the context of ISCI, in a range of 13 years. The goal of this study was to summarise the findings

according to year, journal, country, author, research method, theories, to name a few. The authors verified that the journals Behaviour and Information Technology, Computers in Human Behaviour, Information and Management, Decision Support Systems, and MIS Quarterly dominate the literature use. Most of the studies were conducted in East Asia and North America, with no studies in Africa. Most of the respondents were students. Quantitative research was the most used method, and finally, the authors suggest that future studies could develop meta-analyses in the context of ISCI.

Considering that the above literature reviews in the context of ISCI were qualitative, reporting which technologies were used, methods, countries, type of respondents, theories and journals, no attempt has been made to conduct a quantitative review of ISCI. Considering that most of the studies reported in these literature reviews used a quantitative research design, it is proposed for this study to perform a meta and moderator analysis. By conducting this study, we expect to contribute to the IS discipline. From the results obtained in this investigation, it is possible to consolidate and generalise the relationships tested with continuance intention (Schmidt. & Hunter, 2004).

2.3. Research methodology

The study analyses and summarises the current findings on the IS continuance intention models. The process of literature selection was based on the following criteria. First, we chose the appropriate keywords for our research, such as continuance intention, post-adoption, continuance usage, continuance behaviour, continuance usage intention, continuance intention to use, IT continuance, IS continuance, and IS continuance theory in all possible combinations. Next, we applied the keywords in different research databases (Scopus, ACM digital library, EBSCO, Emerald, Taylor & Francis, Springer, Web of Science, Science Direct, JSTOR, and Google Scholar), taking into consideration the logical operators such as AND, and OR (Hamari & Keronen, 2017).

After searching in the databases, we found more than 1000 articles related to the keywords used in the query. Some articles were duplicated; in this case, they were excluded. We opened each article, read the abstracts, verified if the articles are related to the IS, and if they presented a theoretical model, and quantitative data to validate

them. After the verification, we found 181 articles. We then applied other criteria to assess the research relevance. To ensure the inclusion of relevant and current developments, we adopted the following criteria:

- The period studied ranges from 2001 to 2017;
- The studies were published under a peer review process;
- The studies analysed at an individual level;
- The type of study had to be quantitative;
- The studies had to show correlation coefficients between the variables used to support the theoretical model;
- The construct continuance intention or continuance behaviour had to be the outcome of the theoretical models;
- The datasets (databases) of the studies had to be independent;
- Studies that used secondary databases or samples or databases that other studies had already used were excluded in order to avoid biases (Baptista & Oliveira, 2016; Wood, 2007).

Research that had multiple independent databases or samples (longitudinal studies) were included. E.g., Zhou et al., (2015) contributed with four datasets; Lee et al., (2007) contributed with three datasets; Lowry et al., (2015) contributed with three datasets. After this, we found 115 articles and 129 datasets for our research. This approach is considered suitable sampling compared to other studies published in top-level journals, e.g. Zhao et al., (2017) with 35 studies, Hamari and Keronen, (2017) with 48 studies, Zhang et al., (2012) with 53 studies, Šumak et al., (2011) with 42 studies, Gerow et al., (2014) with 30 studies, Wu et al., (2011) with 128 studies, Baptista and Oliveira, (2016), which included 57 studies, and Rana et al., (2015) with 63 studies. Figure 2.1 summarises the process to select the relevant articles for our research.

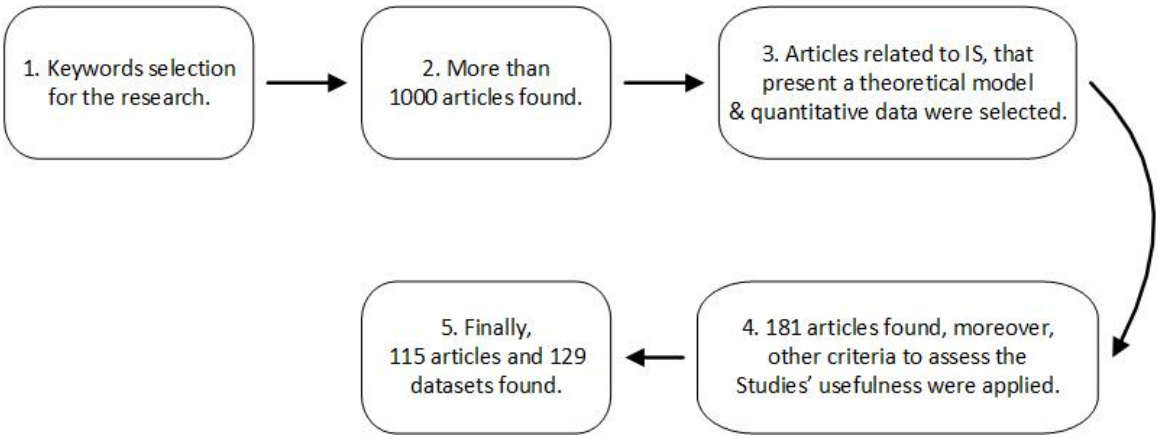

Figure 2.1 - Process to select articles for our research.

According to Rana et al., (2015) and Baptista and Oliveira, (2016), the relationships that were examined three or more times in the studies were selected, summarising 60 relationships. Weight analysis for each relationship was performed based on the number of significant relationships and the total number of relationships (Rana et al., 2015). We have used a random effect to calculate the estimated effect size variability between studies. We consider random effect appropriate because it considers the variation between studies and variation between study methods. Fixed effect methods only consider the variation between studies because of the sampling participation (Schmidt. & Hunter, 2004).

After the extraction of the correlation coefficients of the variable relationships, a single cumulative value was calculated for each of the relationships. These values, combined with study total sample sizes, supported the findings of the meta-analysis. We used the free software *meta-essentials 1.1* (Rhee et al., 2015) to obtain the meta-analysis results. Additional, information on the data was extracted: the country with the largest sample size, the evolution of the number of papers, technologies, and theories used in the studies, and studies used in meta-analysis and weight analysis (Appendix A). Figure 2.2 illustrates the sum of all samples per country.

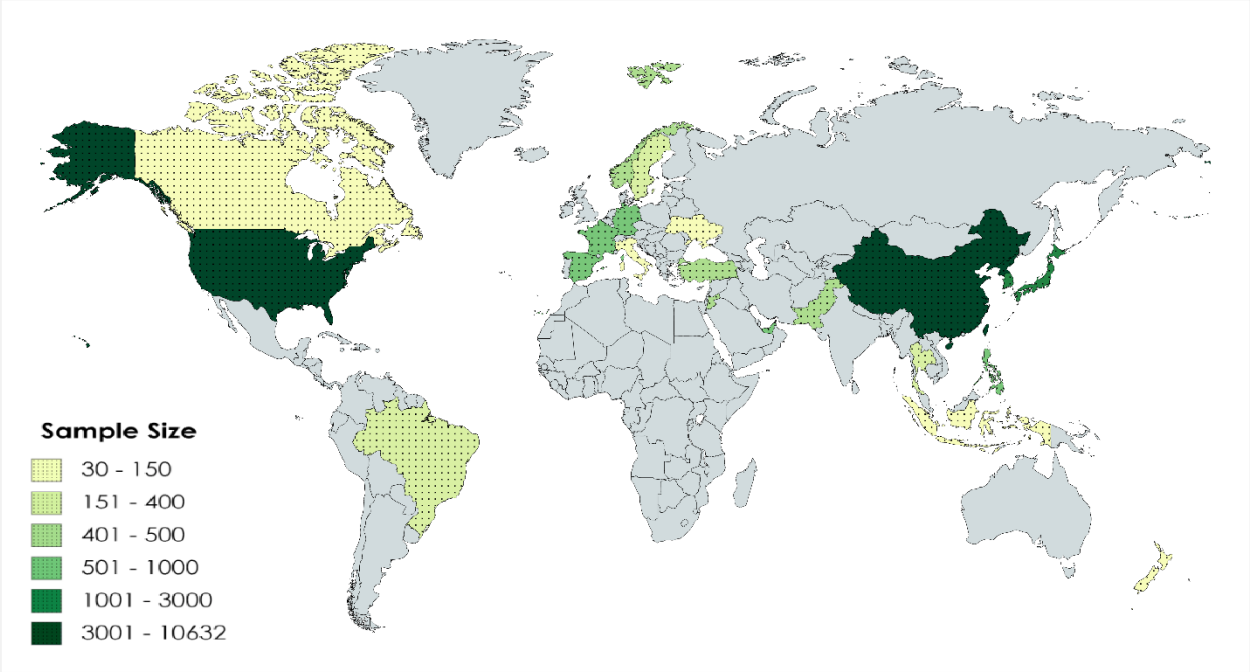

Figure 2.2 - Countries and sample size used in studies.

During the period of our analysis (2001 to 2017), many journals (peer-reviewed) published different numbers of ISCI articles. Appendix B illustrates the number and evolution of articles that each journal published per year. However, between 2001 and 2010, the number of articles published was lower. The number began to grow from 2011 until 2017, and the expectation is to continue growing. The journals with more than ten publications are highlighted.

In the data extraction process, the original names of the independent and dependent variables from the studies were collected. In this process, we found variables with different names but deduced that they probably have a similar definition, e.g., perceived usefulness, usefulness, usefulness expectations; user satisfaction, overall satisfaction, satisfaction; confirmation, confirmation of expectations. In these circumstances, we chose the names of the most used variables in the literature, e.g., perceived usefulness, satisfaction, confirmation). More detailed information is presented in Appendix C.

2.3.1. Moderator analysis

Concerning moderators, we investigated some moderating effects in different relationships. To select the relationships, we used relationships that have enough observations (> 30) (Geyskens et al., 2009; Lipsey & Wilson, 2001). Regarding the moderator variables, we have selected different moderators suggested by the literature (Hofstede & Minkov, 2010; F. D. O. Santini et al., 2019). For our study, we have used methodological, economic, and cultural moderators. This analysis is essential for the literature because it provides researchers a better understanding of the effects of the relationships and provides an overview of the potential moderators that can influence the continuance intention to use IS in future studies. Appendix D presents the moderators, the descriptions, and the coding structure. Sample size was analysed as a methodological moderator, considering that it plays a significant role in varying the effect sizes in the studies (Fern & Monroe, 1996). While a small sample size is more homogeneous, this aspect tends to overestimate the effect size of the relationships (Rosenthal & Rubin, 1982). We have also analysed moderators in the economic context, (1) economic development, and (2) innovation level. Economic development can play an important role as it tends to promote different levels of use of IS. Therefore, we expect that developed economies influence the behaviour of the intention to continue using IS, compared to developing economies (Y. Kim & Peterson, 2017). On regards innovation level, it is considered a potential moderator because it can influence the relationships, taking into consideration that countries with a high level of innovation tend to continue using IS as they have good skills and familiarity with systems usage (Y. Kim & Peterson, 2017). Finally, we have analysed six cultural moderators from Hofstede, power distance, individualism, masculinity, uncertainty avoidance, long term orientation, and indulgence. These cultural dimensions are recognised as the leading indicators of people's beliefs and values that impact their behaviour, so we consider potential moderators that can influence the intention to continue using IS (Hofstede & Minkov, 2010). Our analysis was supported on a hierarchical linear meta-analysis. This analysis uses the multivariate regression format for the variables included in the model and is widely used in meta-analytic research (Geyskens et al., 2009; F. D. O. Santini et al., 2019).

2.4. Findings

2.4.1. Meta-Analysis

Table 2.1 represents the meta-analysis and weight analysis of the 60 relationships that were most often used, and which have occurred three or more times across the 115 studies. Columns 4 to 8 (meta-analysis information) of Table 2.1 present the number of times that a relationship was analysed (total), the sum of samples (sample), an average of the correlation coefficient (AVG of cc), normal standard deviation (Z – value), and 95% confidence interval. In addition, we then show the relationship between the dependent constructs and the independent constructs. Several dependent constructs relate to different independent constructs, such as continuance intention, which relates to 16 different independent constructs, followed by satisfaction, which applies to 14 different constructs and perceived usefulness, which applies to 7 different constructs.

The meta-analysis results reveal that the correlation coefficient of 60 relationships is statistically significant ($p < 0.01$). The largest Z-values are satisfaction on continuance intention (75.695), confirmation on perceived usefulness (55.921), confirmation on satisfaction (48.176), attitude on continuance intention (35.602), perceived usefulness on continuance intention (34.287), and perceived usefulness on satisfaction (33.995).

2.4.2. Weight analysis

This method is used to estimate the importance of a predictor (i.e. independent construct) and predicts the strength of an independent construct (Jeyaraj et al., 2006). The weights of the 60 most used relationships were examined and are presented in columns 9 to 12 in Table 2.1.

The value of weight was computed by dividing the number of statistically significant relationships by the total number of studies used. When the weight is one (1), it shows that the relationship within the variables is significant in all the research, but if the weight is zero (0), it indicates that the relationship is not significant through all the studies examined (Jeyaraj et al., 2006).

Table 2.1 - The most frequently used relationships for meta-analysis and weight-analysis (Ordered by dependent constructs).

Nº (1)	Independent Constructs (2)	Dependent Constructs (3)	Meta-analysis						Weight analysis			
			Total (4)	∑ Sample (5)	AVG of cc (6)	Z – value (7)	95% confidence interval (low - high) (8)		Non-significant (9)	Significant (10)	Total (11)	Weight (Significant/ Total) (12)
1	**Hedonic Value**	**Affective Commitment**	5	1266	0.339	12.536	0.198	0.301	**0**	**5**	**5**	**1.000**
2	**Relational Capital**		5	1266	0.258	9.381	0.206	0.309	**0**	**5**	**5**	**1.000**
3	**Utilitarian Value**		5	1266	0.112	3.997	0.057	0.166	**1**	**4**	**5**	**0.800**
4	Perceived Ease of Use	**Attitude**	5	1209	0.162	5.676	0.095	0.210	2	3	5	0.600
5	**Perceived Usefulness**		13	4535	0.408	29.164	0.362	0.414	**1**	**12**	**13**	**0.923**
6	**Satisfaction**		6	2580	0.481	26.615	0.451	0.510	**0**	**6**	**6**	**1.000**
7	Service Quality	Confirmation	4	1244	0.339	12.434	0.282	0.394	0	4	4	1.000
8	**Continuance Intention**	**Continuance Behaviour**	5	1526	0.375	15.385	0.331	0.417	**0**	**5**	**5**	**1.000**
9	**Affective Commitment**	**Continuance Intention**	5	1266	0.556	22.284	0.517	0.593	**0**	**5**	**5**	**1.000**
10	**Attitude**		14	5657	0.441	35.602	0.409	0.458	**0**	**14**	**14**	**1.000**
11	Effort Expectancy		3	1075	0.253	8.467	0.196	0.308	1	2	3	0.667
12	**Flow**		5	1243	0.358	13.207	0.308	0.406	**1**	**4**	**5**	**0.800**
13	**Habit**		5	1691	0.255	10.713	0.210	0.299	**0**	**5**	**5**	**1.000**
14	**Hedonic Outcome Expectations**		7	1951	0.437	20.679	0.435	0.567	**0**	**7**	**7**	**1.000**
15	Intrinsic Motivation		3	508	0.453	10.977	0.381	0.520	0	3	3	1.000
16	**Perceived Behaviour Control**		7	3021	0.296	16.763	0.263	0.328	**0**	**7**	**7**	**1.000**
17	Perceived Ease of Use		6	2280	0.074	3.538	0.013	0.104	2	4	6	0.667
18	**Perceived Enjoyment**		16	5808	0.187	14.417	0.158	0.210	**3**	**13**	**16**	**0.813**
19	**Perceived Usefulness**		41	13686	0.285	34.287	0.265	0.297	**4**	**37**	**41**	**0.902**
20	**Performance**		5	3707	0.241	14.962	0.210	0.271	**1**	**4**	**5**	**0.800**
21	**Satisfaction**		74	29220	0.416	75.695	0.399	0.419	**2**	**72**	**74**	**0.973**
22	**Subjective Norm**		11	4379	0.179	11.970	0.150	0.208	**1**	**10**	**11**	**0.909**
23	**Trust**		7	2353	0.239	11.814	0.175	0.260	**1**	**6**	**7**	**0.857**
24	**Utilitarian Value**		9	498	0.242	5.493	0.157	0.323	**0**	**9**	**9**	**1.000**
25	Perceived Usefulness	Disconfirmation	3	1149	0.133	4.529	0.076	0.189	0	3	3	1.000
26	Satisfaction	Habit	3	755	0.456	13.499	0.397	0.511	0	3	3	1.000
27	**Confirmation**	**Perceived Ease of Use**	6	1511	0.458	19.214	0.471	0.548	**0**	**6**	**6**	**1.000**
28	Context		3	5121	0.233	16.981	0.207	0.259	0	3	3	1.000
29	Individualism		3	5121	0.300	22.143	0.275	0.325	0	3	3	1.000
30	Time perception		3	5121	0.177	12.797	0.150	0.203	0	3	3	1.000
31	Uncertainty Avoidance		3	5121	-0.137	-9.863	-0.164	-0.110	0	3	3	1.000
32	**Confirmation**	**Perceived Enjoyment**	7	2145	0.622	33.705	0.607	0.663	**0**	**7**	**7**	**1.000**
33	Context		3	5121	0.157	11.325	0.130	0.184	0	3	3	1.000
34	Individualism		3	5121	0.223	16.226	0.197	0.249	0	3	3	1.000
35	Uncertainty Avoidance		3	5121	-0.137	-9.863	-0.164	-0.110	1	2	3	0.667
36	Context	Perceived Monetary Value	3	5121	0.200	14.504	0.174	0.226	0	3	3	1.000
37	Individualism		3	5121	0.323	23.965	0.298	0.347	0	3	3	1.000
38	Time Perception		3	5121	0.190	13.760	0.163	0.216	0	3	3	1.000
39	Uncertainty Avoidance		3	5121	-0.233	-16.981	-0.259	-0.207	0	3	3	1.000
40	**Confirmation**	**Perceived Usefulness**	33	10168	0.504	55.921	0.492	0.522	**0**	**33**	**33**	**1.000**
41	Context		3	5121	0.223	16.226	0.197	0.249	0	3	3	1.000
42	**Disconfirmation**		6	1825	0.555	26.703	0.593	0.652	**0**	**6**	**6**	**1.000**
43	Individualism		3	5121	0.287	21.125	0.262	0.312	0	3	3	1.000
44	**Perceived Ease of Use**		12	3532	0.327	20.166	0.268	0.329	**1**	**11**	**12**	**0.917**
45	Time Perception		3	5121	0.177	12.797	0.150	0.203	0	3	3	1.000
46	Uncertainty Avoidance		3	5121	-0.170	-12.281	-0.196	-0.143	0	3	3	1.000
47	**Confirmation**	**Satisfaction**	35	10918	0.431	48.176	0.395	0.427	**0**	**35**	**35**	**1.000**
48	**Disconfirmation**		9	2576	0.576	33.299	0.550	0.601	**0**	**9**	**9**	**1.000**
49	Hedonic Benefit		3	928	0.349	11.080	0.291	0.404	0	3	3	1.000
50	**Information Quality**		5	1735	0.248	10.541	0.203	0.292	**1**	**4**	**5**	**0.800**
51	**Perceived Ease of Use**		10	7112	0.188	16.042	0.148	0.194	**0**	**10**	**10**	**1.000**
52	**Perceived Enjoyment**		12	8018	0.251	22.962	0.230	0.271	**2**	**10**	**12**	**0.833**
53	**Perceived Usefulness**		46	18018	0.248	33.995	0.217	0.245	**8**	**38**	**46**	**0.826**
54	Perceived Value		3	1158	0.203	6.996	0.147	0.258	0	3	3	1.000
55	Performance		3	2579	0.390	20.901	0.357	0.422	0	3	3	1.000
56	Service Quality		5	2608	0.296	15.574	0.058	0.151	2	3	5	0.600
57	Social Benefit		3	928	0.334	10.563	0.160	0.282	0	3	3	1.000
58	**System Quality**		7	2477	0.279	14.255	0.242	0.315	**0**	**7**	**7**	**1.000**
59	Trust		3	880	0.313	9.591	0.252	0.371	0	3	3	1.000
60	Utilitarian Benefit		3	928	0.182	5.598	0.119	0.244	0	3	3	1.000

Note: The highlighted relationships are the best predictors of the weight analysis.
AVG of cc = average of the correlation coefficient; Z-value = normal standard deviation.

In order to identify the most effective predictors to use IS continuance intention, (Jeyaraj et al., 2006) classified independent variables in two ways: the variables that were evaluated 5 (five) or more times were classified as well-utilised, and the variables evaluated less than 5 (five) times seen as experimental. Additional definitions of Jeyaraj et al., (2006) have been taken into consideration : best predictors – are the relationships that were classified as well-utilised with the weight greater than or equal to 0.8; and promising predictors – relationships that were classified as experimental with the weight equal to 1.

The outcomes of the 60 relationships assessed in the weight analysis show that 34 were classified as well-utilised, and 31 as best predictors (highlighted relationships) of the continuance intention to use an IS. Additionally, 24 out of 26 experimental relationships were classified as promising predictors, requiring more evaluation to succeed as best predictors. For future research, we encourage researchers to evaluate such promising predictors. However, in all the studies, no type of relationship was found to be not significant.

According to the findings of meta- and weight analyses, the most often used dependent variables were continuance intention, satisfaction, and perceived usefulness. Therefore, the most used independent variables to explain continuance intention (used more than ten times) were satisfaction, perceived usefulness, perceived enjoyment, attitude, and subjective norms.

2.4.3. Moderator analysis

The analysis of potential moderators was performed using factors from the methodological, economic, and cultural context. Thus, these factors were tested in the relationships that predict continuance intention, and present a considerable number of observations (at least 30) (Geyskens et al., 2009; Lipsey & Wilson, 2001). However, the relationships selected were perceived usefulness and satisfaction to continuance intention (Schmidt & Hunter, 2016). The results of the analysis are presented in Table 2.2.

The moderator sample size had a significant moderating effect on the relationship of perceived usefulness to continuance intention ($\beta = 0.338$, $M_{\_Low} = 0.418$, $M_{\_High} =$

0.316, $p < 0.05$), and had no significant moderating effect for the other relationships of satisfaction to continuance intention ($\beta = 0.502$, $M\_{Low} = 0.461$, $M\_{High} = 0.448$).

In the economic context, the moderator economic development had no significant moderating effect of perceived usefulness to continuance intention ($\beta = 0.467$, $M\_{Low} = 0.364$, $M\_{High} = 0.380$), and satisfaction to continuance intention ($\beta = 0.546$, $M\_{Low} = 0.451$, $M\_{High} = 0.466$). Similarly, the moderator innovation level had no significant moderating effect of perceived usefulness to continuance intention ($\beta = 0.490$, $M\_{Low} = 0.330$, $M\_{High} = 0.414$), and satisfaction to continuance intention ($\beta = 0.491$, $M\_{Low} = 0.492$, $M\_{High} = 0.438$).

In the cultural context, the power distance moderator had a significant moderating effect of satisfaction to continuance intention ($\beta = 0.455$, $M\_{Low} = 0.495$, $M\_{High} = 0.414$, $p < 0.05$), and had no significant moderating effect on the other relationship of perceived usefulness to continuance intention ($\beta = 0.497$, $M\_{Low} = 0.320$, $M\_{High} = 0.445$). The moderator individualism had a significant moderating effect of perceived usefulness to continuance intention ($\beta = 0.499$, $M\_{Low} = 0.308$, $M\_{High} = 0.420$, $p < 0.1$), and had no significant moderating effect on the other relationship, satisfaction to continuance intention ($\beta = 0.526$, $M\_{Low} = 0.393$, $M\_{High} = 0.449$). The moderator masculinity had a significant moderating effect of satisfaction to continuance intention ($\beta = 0.527$, $M\_{Low} = 0.374$, $M\_{High} = 0.465$, $p < 0.1$) and had no significant moderating effect on the other relationship of perceived usefulness to continuance intention ($\beta = 0.511$, $M\_{Low} = 0.336$, $M\_{High} = 0.435$). The moderator uncertainty avoidance had a significant moderating effect on perceived usefulness to continuance intention ($\beta = 0.361$, $M\_{Low} = 0.441$, $M\_{High} = 0.327$, $p < 0.1$), and had no significant moderating effect on the relationship satisfaction to continuance intention ($\beta = 0.473$, $M\_{Low} = 0.433$, $M\_{High} = 0.430$). Similarly, the moderator long term orientation had a significant moderating effect on perceived usefulness to continuance intention ($\beta = 0.332$, $M\_{Low} = 0.420$, $M\_{High} = 0.308$, $p < 0.1$), and had no significant moderating effect on the relationship satisfaction to continuance intention ($\beta = 0.540$, $M\_{Low} = 0.453$, $M\_{High} = 0.455$). Finally, the moderator indulgence had a significant moderating effect on the relationship satisfaction to continuance intention ($\beta = 0.584$, $M\_{Low} = 0.425$, $M\_{High} =$

0.484, $p < 0.1$), and had no significant moderating effect on the relationship perceived usefulness to continuance intention ($\beta = 0.394$, $M_{\_Low} = 0.408$, $M_{\_High} = 0.343$).

Table 2.2 - Moderation's analysis.

Moderator Level		Perceived Usefulness to Continuance Intention			Satisfaction to Continuance Intention		
		β	R	P_value	*β*	R	P_value
Sample size	Intercept	.338		.001	.502		.001
	High	1	.316		1	.448	
	Low	.159	.418	.038**	.049	.461	.409
Economic development	Intercept	.467		.001	.546		.001
	High	1	.380		1	.466	
	Low	-.067	.364	.454	-.026	.451	.712
Innovation Level	Intercept	.490		.001	.491		.001
	High	1	.414		1	438	
	Low	-.125	.330	.163	.094	.492	.113
Power Distance	Intercept	.497		.001	.455		.001
	High	1	.445		1	.414	
	Low	-.125	.320	.158	.143	.495	.015**
Individualism	Intercept	.499		.001	.526		.001
	High	1	.420		1	.449	
	Low	-.166	.308	.055*	.015	.393	.836
Masculinity	Intercept	.511		.001	.527		.001
	High	1	.435		1	.465	
	Low	-.138	.336	.153	-.118	.374	.060*
Uncertainty avoidance	Intercept	.361		.001	.473		.001
	High	1	.327		1	.430	
	Low	.159	.441	.096*	.018	.433	.772
Long Term orientation	Intercept	.332		.001	.540		.001
	High	1	.308		1	.455	
	Low	166	.420	.055*	-.020	.453	.769
Indulgence	Intercept	.394		.001	.584		.001
	High	1	.343		1	.484	
	Low	.063	.408	.431	-.115	.425	.053*

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

2.5. Discussion

Considering the number of studies on continuance intention to use an IS using theories or models, it becomes significant and suitable to analyse and discuss their collective findings. We can verify that the variables and relationships used are quite dispersed, as studies are analysing different IS technologies, studies from separate times, and different geographical spaces with distinct cultures.

The results reveal that the meta- and weight analyses for the independent variables on equivalent dependent variables are closer. The higher the weight of an independent variable, the greater is the probability that it is significant in performing the meta-analysis (Rana et al., 2015). In the meta-analysis, all the 31 best predictors, and all the

24 promising predictors were found to be statistically significant. The remaining three well-utilised relationships, namely service quality on satisfaction, perceived ease of use on attitude, and perceived ease of use on continuance intention, were also statistically significant. The results reveal that the most important relationships to predict continuance intention to use an IS are simultaneously statistically significant in meta-analysis and best predictors in weight analysis.

Additionally, the width of the confidence interval depends on the correctness of individual studies along with the number of the cumulative studies (Rana et al., 2015). We can verify that all of the best predictor and promising predictor relationships obtained a narrow interval, providing confidence to the level of variance of the correlation values.

According to the results, three theoretical models (Figure 2.3) were designed to support future studies on continuance intention to use an IS. The first model (A) was created using all the data from our analysis (general model), and then, to understand the model's evolution, the data were divided into two groups (from 2001 to 2010, and from 2011 to 2017), and with this information, two more models were created. The second model (B) was created using data from 2001 to 2010, and the last model (C) was created using data from 2011 to 2017. To generate the theoretical models, first, significant relationships from the meta-analysis were selected, second, the best predictors of weight analysis were selected, and finally, direct or indirect variables related to continuance intention to use an IS were selected. Moreover, the relationships such as service quality on satisfaction, perceived ease of use on attitude, and perceived ease of use on continuance intention were evaluated five or more times and with weight less than 0.8. Basically, because they were statistically non-significant in individual studies, future research is needed to prove or disapprove the existing trend (Jeyaraj et al., 2006).

According to the findings, it is possible to understand that there is an evolution of the models, just by comparing the original model of IS continuance intention (A Bhattacherjee, 2001) with our general model. The general model is more complex and presents more relationships with a significant set of constructs. Going to model B, it is simpler than the general model (A). This facet means that, in that period (2001 to 2010), the key factors that influenced users to continue using IS were: satisfaction, perceived

usefulness, and attitude. Continuance intention was used to predict continuance behaviour. In model B, Confirmation only explains satisfaction and perceived usefulness over time, and it starts explaining perceived ease of use and perceived enjoyment. This phenomenon also happened with perceived ease of use. It only explains satisfaction, over time, and explains perceived usefulness.

In model C, which is more complex than model B and very similar to the general model (A), we can argue that in that period (2011 to 2017), (i) the type of IS increased considerably, then, to support this phenomenon, (ii) the number of constructs also increased. In model B, we have disconfirmation explaining satisfaction and perceived usefulness, but we do not have these relationships in model C. This means that these relationships have been so well-explored that they became part of a collective body of knowledge. In model B, we have perceived ease of use explaining satisfaction; over time, the same construct started explaining perceived usefulness and began to be explained by confirmation. In model C, we do not have continuance intention explaining continuance behaviour. From 2011 to 2017, it is possible to verify that the independent constructs increased significantly. Some constructs belong to other theoretical models, for example, attitude, subjective norms, and perceived behaviour control (Ajzen, 1985), system quality and information quality (DeLone & McLean, 1992) perceived ease of use (Davis, 1989). Two constructs do not appear in either model B or C but appear in the general model (A), such as performance and perceived behaviour control. This element means that these relationships have been explored over the whole range of our analysis (2001 - 2017). Moreover, when the dataset was divided, they did not become statistically significant in both groups.

However, over time, the theoretical models grow more complex, and new constructs appear, such as perceived enjoyment, trust, flow, subject norms, and performance, etc. Nevertheless, some constructs are in decadence because they turned into common knowledge, and some constructs like satisfaction, perceived usefulness, confirmation, perceived ease of use, and attitude remain over time. This characteristic means that these constructs are still essential to predict IS continuance intention. Now we can argue that we have a powerful model (A) to predict continuance intention to use IS, using

distinct types of technologies, in different environments. In addition, the theoretical models had a significant evolution.

The dashed relationships mean that they were not statistically significant and best predictors in that period. Moreover, the performance and perceived behaviour control on continuance intention were statistically significant and best predictors only with all the dataset (model A).

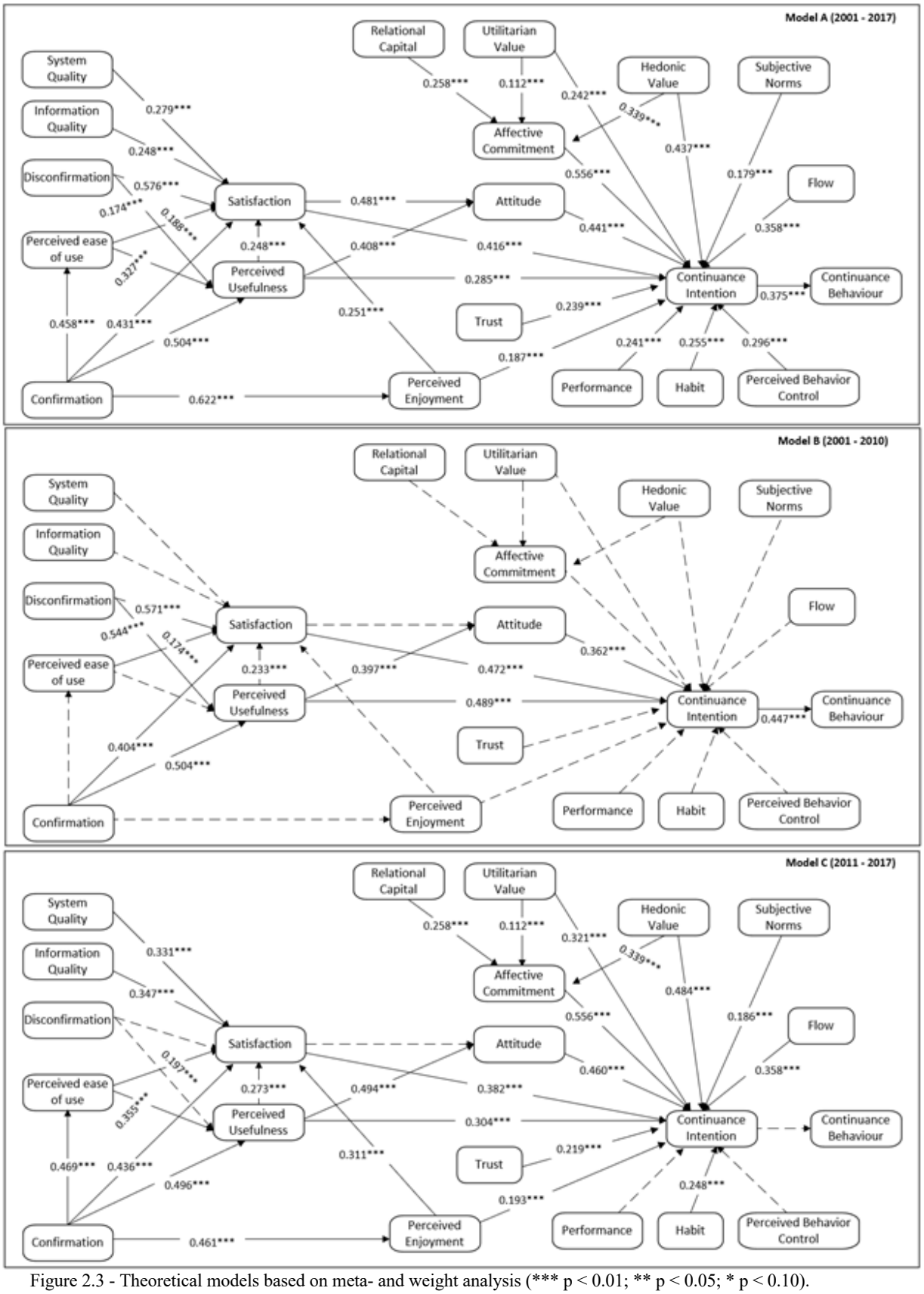

Figure 2.3 - Theoretical models based on meta- and weight analysis (*** p < 0.01; ** p < 0.05; * p < 0.10).
Note: The dashed relationships represented above were not statistically significant and best predictors in the period of analysis.

We also found interesting results from the moderation analysis. In the methodology context, we found that the sample size has a moderating effect in the relationship of perceived usefulness to continuance intention. This outcome was not crucial to the relationship of satisfaction to continuance intention. The result showed that studies with low sample size have a strong relationship than studies with high sample size. This result confirms our assumption that a small sample has smaller effect variations in the studies (Fern & Monroe, 1996).

Regarding the economic context, the moderator's economic development and innovation level had no moderating effect in the tested relationships. This result is similar to another study (F. de O. Santini et al., 2019). However, we consider these moderators important, considering that high economic and innovated countries tend to use more technologies (Y. Kim & Peterson, 2017). Therefore, it is suggested that future studies use and test these moderators to bring new insights to the literature.

Concerning culture moderators, the moderator power distance had a significant moderating effect in the relationship satisfaction to continuance intention. Low power distance promoted a stronger effect than high power distance. This finding suggests that the people in this culture are more independent and accept that the power can be distributed unequally, therefore, influencing the satisfaction and continuance intention to use IS (Baptista & Oliveira, 2015; Hofstede & Minkov, 2010). The moderator individualism had a significant moderating effect in the relationship between perceived usefulness and continuance intention. The result showed that high level of individualism promotes a stronger relationship. This result highlights the fact that individualist people tend to have more perceptions of the usefulness of the systems, therefore, promoting continuance intention behaviour (Baptista & Oliveira, 2015; Hofstede, 1984).

The moderator masculinity had a significant moderating effect in the relationship between satisfaction and continuance intention. The result showed that a high level of masculinity promotes stronger relationships. This finding means that society has a high level of competitions to achieve success. Therefore, competitive people tend to use more technologies, acquire new skills, thus, promoting satisfaction and the intention to

continue using IS (Hofstede & Minkov, 2010). The moderator uncertainty avoidance had a significant moderating effect in the relationship between perceived usefulness and continuance intention. The result showed that a low level of uncertainty avoidance promotes a stronger relationship. This finding is in accordance with another study (Baptista & Oliveira, 2015), suggesting that cultures that have a low level of uncertainty avoidance are more open to new technology, they improvise when necessary, tend to take risks, consequently, promoting continuance intention to use IS (Baptista & Oliveira, 2015). The moderator long term orientation had a significant moderating effect in the relationship perceived usefulness to continuance intention. The result presented that low level of long-term orientation have a stronger influence on the relationship. This finding suggests that cultures with short term orientation tend to follow instructions, respect tradition, and focus on achieving quick results (Baptista & Oliveira, 2015). Finally, the moderator indulgence had a significant moderating effect in the relationship between satisfaction and continuance intention. The result revealed that a high level of indulgence promotes stronger relationships. This dimension means that people exhibit a willingness to fulfil their impulses and desires. Therefore, when they fulfil their desires, it is expected to promote satisfaction and continuance intention to use IS (Hofstede & Minkov, 2010).

2.5.1. Theories, contexts, and technologies used in ISCI

Studies on ISCI have used a wide range of theories such as the ECM (Bhattacherjee, 2001), expectation-confirmation theory (ECT) (Oliver, 1986), TAM (Davis, 1989), UTAUT (Venkatesh et al., 2003), Flow theory (Getzels & Csikszentmihalyi, 1978), to name a few. The results present that ECM was the most used theory, followed by TAM and ECT. Therefore, few studies used a single theory (Al-Debei et al., 2013; Y. P. Chang & Zhu, 2012; Susanto et al., 2016), most of them integrated more than one theory in the context of ISCI (Shih Chih Chen et al., 2013; Gao et al., 2015; C. H. Hsiao et al., 2016). Additionally, the results show that some acceptance theories such as TAM and UTAUT were used in the context of ISCI (Belanche et al., 2014; Hadji & Degoulet, 2016; Joo et al., 2016; B. Wu & Chen, 2017). However, Bhattacherjee and Barfar, (2011) argued that it is not appropriate to use acceptance theories because it can

generate misunderstandings and misapplications of the theories. We believe that instead of using traditional theories (TAM, TRA, ECT, etc.) we should import theories from other areas (e.g. psychology, medicine) and try new direct, indirect and moderation relationships, to present new results and insights (A. Bhattacherjee & Barfar, 2011; Nabavi et al., 2016). In the context of ISCI, ECM was the first theory proposed by (A Bhattacherjee, 2001). ECM proposes that satisfaction to use IS is a crucial factor that impacts continuance intention, followed by perceived usefulness. Moreover, confirmation of expectations and perceived usefulness are important factors that influence user satisfaction. Most studies used ECM as a base theory. Some used ECM alone (Alraimi et al., 2015; Oghuma et al., 2016; Susanto et al., 2016) and others integrated with other theories and self-constructs (Shih Chih Chen et al., 2013; M.-C. Lee, 2010; Limayem & Cheung, 2008). The results show that most studies have integrated more than one theory, so, we also agree with this practice, considering that it bestows new knowledge and enriches the theoretical models.

In the technological context, the findings demonstrate that a wide variety of systems have been studied. Previous literature reviews have categorised the different types of technologies such as mobile information systems (MIS) (e.g. mobile instant messaging, mobile banking, mobile commerce), electronic business information systems (EBIS) (e.g. public e-services, online tourism services, Knowledge management systems), social information systems (SIS) (e.g. online communities, social networking services) and electronic learning information systems (ELIS) (e.g. e-learning, educational games, teaching blogs), to name a few (Nabavi et al., 2016; Shaikh & Karjaluoto, 2015). Of the 115 studies, most of them fall into the EBIS category (27%), followed by SIS, MIS (26%), and ELIS (21%). Our findings are similar to those of Shaikh and Karjaluoto (2015), however, the SIS and MIS categories are booming, revealing a trend in recent years.

Regarding the region, the results are similar to previous literature reviews (Nabavi et al., 2016; Shaikh & Karjaluoto, 2015). The most studied regions were East Asia (e.g. Taiwan, China, Korea and Hong Kong), North America (e.g. USA), Europe (e.g. Spain, Germany, UK and France), Middle East (e.g. UAE, Kuwait), one in South America (Brazil) and Southeast Asia (The Philippines), however, no studies on ISCI were found in any African region (Nabavi et al., 2016; Shaikh & Karjaluoto, 2015).

2.5.2. Implications for research

The different studies have several implications for the literature. This research provides a complete image of all types of constructs, which were already studied in various subject areas on continuance intention to use IS. The findings from the meta-analysis and weight of the variables illustrated in this study aid researchers in making a careful selection of variables, contributing to future research (Hamari & Keronen, 2017). The results reveal that system quality, information quality, confirmation, disconfirmation, perceived ease of use, perceived usefulness, and perceived enjoyment are the most important constructs to influence satisfaction. The results further show that perceived ease of use can mediate the relationship between confirmation and satisfaction, and confirmation and perceived usefulness.

Additionally, perceived enjoyment can mediate the relationship between confirmation and satisfaction. Satisfaction can mediate the relationship between perceived enjoyment and continuance intention. Attitude can mediate the relationship between satisfaction and continuance intention. Affective commitment can mediate the relationship between utilitarian value, the hedonic value on continuance intention.

Moreover, the results show that there is a wide variety of constructs, coming from different theories and contexts, that can significantly influence continuance intention. These include affective commitment (Z. Zhou et al., 2012, 2015), hedonic value (Hong et al., 2016a; Hong et al., 2016b), attitude (S. Hong et al., 2008; Liang et al., 2013), trust (C. Liao et al., 2006; Susanto et al., 2016), performance (Al-Debei et al., 2013; C. M. Chiu & Wang, 2008), habit (C. Liao et al., 2006; Limayem & Cheung, 2008), perceived behaviour control (B. Kim, 2010; M.-C. Lee, 2010), flow (Y. P. Chang & Zhu, 2012; Gao et al., 2015), and subjective norm (A. Bhattacherjee & Lin, 2014; Mouakket, 2015), thus, demonstrating that different theories and self-constructs can be integrated into the ISCI context. However, researchers can use our findings for future research, e.g., to those relationships that are statistically significant and have been classified as promising predictors (e.g., service quality on confirmation, performance on satisfaction, etc.) to become best predictors. Finally, the moderation analysis

highlighted interesting results. The variables sample size, individualism, uncertainty avoidance, and long term orientation moderate the relationship between perceived usefulness and continuance intention. Furthermore, the variables power distance, masculinity, and indulgence moderate the relationship between satisfaction and continuance intention.

2.5.3. Implications for practice

The results of this paper have important practical implications. For practitioners, it is crucial to recognise the best predictors of continuance intention to use an IS, for better design and implementation of the IS, thus, ensuring long-term usage (A Bhattacherjee, 2001; Shao, 2018; Yu et al., 2018). The best predictors such as system quality, information quality, and perceived ease of use on satisfaction, and perceived usefulness, perceived enjoyment, and satisfaction on continuance intention are relevant for practitioners. A practitioner should ensure the best implementation of IS for users, with proper infrastructure to use the system and information with quality to ensure user satisfaction (Y. Zhao et al., 2018). Our results reveal that continuance intention to use an IS has been studied in different countries, with different cultures. Therefore, practitioners should have different managing strategies to ensure the satisfaction of the users and long-term usage of the IS (L. Zhang et al., 2012).

The results establish that system quality, information quality, perceived ease of use, perceived usefulness, perceived enjoyment, and confirmation of expectations are important factors to ensure user satisfaction. Thus, practitioners should ensure that the IS works, that users can perform an operation end-to-end, that the IS has no interruptions, that users navigate on the IS easily, that the information provided in the IS is useful, understandable, and accurate, thus making the user realise the quality of the IS. Managers and decision-makers should provide all the necessary information, such as user guides, advertisements, flyers that explain the services and functionalities of the IS, to accelerate the understanding of the services. Managers should also provide IS that are interactive, easy to use, accessible, and fast. For instance, in the case of online banking, managers should be able to provide all the basic information such as short videos explaining how to use the system, guides, and functional helplines, to

ensure that users will not face difficulties using the IS, thus, facilitating the interaction between the user and the IS. Users should realise all the benefits of the IS and be happy to use it. Our results indicate that different constructs can be used to influence continuance intention and show that different technologies were studied. However, managers must ensure that IS attract users, and make them feel part of the IS; for instance, by showing the user that he/she is vital to keep the IS. Advertise the best features or services to attract more users, through practical examples, show the user that the IS is pleasant, that it has a cheerful atmosphere, thus making the user feel pleasure and comfort when using it.

In some communities or companies, the responsible members, such as community leaders, managers, or directors are important people who influence other group of people. However, it is essential that IS managers identify these people and showcase the main benefits of the IS in order to influence others to use it, thereby increasing and attracting more users. The user needs to feel involved when using IS and be curious to use it more often. Thus, the use of IS should become automatic, so that whenever the user needs to fulfil a requirement, think of the IS first. Managers should ensure that users do not have difficulty using IS, by giving them control, resources, and the knowledge and ability to use it. The user should be attracted, in order to have the attitude to use the IS, enjoy using it, enjoy the idea of the IS, and feel comfortable using it. Thus, potential users will continue using the IS.

Additionally, the results attest that the studies were conducted in different regions; in this sense, it is important to realise that communities have different habits and customs. For instance, the study of Chou et al., (2010) presents that in the context of continuance intention for knowledge creation in an online community, perceived identity verification is significant to influence performance expectancy in China (Baidu). However, it is not significant in Taiwan (Yahoo+). Ahmad and Sun, (2018) illustrate that in the context of continuance intention in social media mobile applications, social risk is significant to influence utilitarian value and hedonic value in Pakistan, but it is not in China. Therefore, practitioners should have different managing strategies, considering the region and therefore accommodate the habits, customs, satisfaction of the users and long-term usage of the IS (L. Zhang et al., 2012).

The results underscore that small sample size, high levels of individualism, low levels of uncertainty avoidance, and low levels of long-term orientation positively moderate the relationship between perceived usefulness and continuance intention. Regarding individualism, managers should focus on the task and autonomy of the individual. Individual management is more important than group management (Hofstede & Minkov, 2010). For uncertainty avoidance, the results are important for managers to promote the usability of the IS, considering that they are more receptive to new technology (Baptista & Oliveira, 2015). For long term orientation, the results are pivotal for managers because people with a low level of long-term orientation follow instructions, and respect rules and traditions. However, the results determine that a low level of power distance, a high level of masculinity, and a high level of indulgence positively moderate the relationship between satisfaction and continuance intention.

Concerning power distance, independence is a cardinal characteristic, and power should be distributed unequally (Baptista & Oliveira, 2015; Hofstede & Minkov, 2010). For masculinity, managers should promote competitions and training to motivate people. For indulgence, impulses and desires are more important. Managers should satisfy people according to their desires (Hofstede & Minkov, 2010).

2.5.4. Limitations and recommendation

The research contains several limitations. First, we did not include certain studies because of the unavailability of their quantitative data, or because they were qualitative. For example, some studies did not report the effect size when the relationships were statistically non-significant. Integrating these studies could generate relevant information in terms of the significance of the constructs. Secondly, in the previous research if the data are biased on IS continuance intention, then the effect of the mean presented through meta-analysis will also reflect this bias, and in this study, the handling publication biases are missing. Moreover, we used meta-essentials, a meta-analysis tool. This tool has limitations, considering that meta-essentials is not able to perform more advanced analyses, like linear model or structured equation model (Rhee et al., 2015), future research should consider a more advanced tool to provide more insights and a different approach to research.

Future research should consider relationships like service quality on confirmation, hedonic outcome expectation, and intrinsic motivation on continuance intention, satisfaction on habit, trust, hedonic benefits, and performance on satisfaction as they were classified as promising predictors and were statistically significant with a high average correlation coefficient. Culture has an important impact on IS continuance intention, and future research should incorporate a culture variable such as subjective norms, habit, or attitude, to provide additional insights. Considering that some IS such as mobile payments and gamification are growing exponentially, future research could contemplate a meta-analysis to synthesise and provide more findings in these subjects.

2.6. Conclusions

The goal of our research was to collect and analyse different studies on continuance intention to use IS, by using meta-analysis combined with weight analysis. The systematic review of existing studies comprised 115 papers, which constituted the basis for the analysis of our research. The most used technology was e-learning, followed by social network services. In the process of collecting data for our analysis, we found more than 600 relationships and selected the relationships that had been examined three or more times, totalling 60 different relationships. 34 out of the 60 most used relationships have been examined five or more times. We identified the most used variables in the literature and highlighted their relevance, contributing to the current state of the art (Hamari & Keronen, 2017; K. Wu et al., 2011; Y. Zhao et al., 2018).

Concerning moderation analysis, we presented noteworthy results. The relationship perceived usefulness to continuance intention was moderated with sample size, individualism, uncertainty avoidance and long term orientation. Furthermore, the relationship satisfaction to continuance intention was moderated with power distance, masculinity and indulgence. According to our empirical result, the evolution of the theoretical models was presented, using the best predictors and the significant relationships to predict continuance intention to use an IS. This study works as a reference basis for future research that seek to develop the area of continuance intention to use any type of IS. Moreover, among the most used constructs, we found constructs

from the expectation confirmation model (A Bhattacherjee, 2001), technology acceptance model (Davis, 1989), the theory of planned behaviour (Ajzen, 1985), and the DeLone and McLean IS success model (DeLone & McLean, 1992). According to Jeyaraj et al., (2006) criteria, 31 relationships were classified as *best predictors* (examined five or more times, and weight ≥ 0.8), and 24 relationships were classified as *promising predictors* (examined fewer than five times, and weight = 1), needing more tests to qualify as the best predictors.

Chapter 3 – Understanding the factors of mobile payment continuance intention: empirical test in an African context

3.1. Introduction

In recent years the number of mobile phone users has been growing exponentially, motivating companies to deliver services via mobile phones (Karjaluoto et al., 2019; Persaud and Azhar, 2012; J. Wu et al., 2017). Mobile payment (m-payment) is one of the many services that can be used via mobile phones. M-payment is a imbursement method that uses mobile phones to make financial transactions such as paying for goods or services, transferring money, and withdrawing money (Fan et al., 2018a; T. Zhou, 2013). M-payment technology was a disruptive revolution that affected payment ecosystems, originating in the United States and spreading throughout the world (Fan et al., 2018a). In Africa, m-payment was launched in Kenya, and was quickly adopted in other countries. Mozambique is one of the African countries that adopted m-payment, helping rural people who do not have banking infrastructure near them (Batista and Vicente, 2018). When we compare the usefulness of m-payment in developed and developing economies, it appears that the impact on people's lives is most noticeable in developing economies, considering that financial services do not reach most of the population yet, and most people travel long distances to access them (Asamoah et al., 2020; Humbani and Wiese, 2018; Iman, 2018). M-payment has a major impact on these communities because it provides basic financial services such as money transfer, payment of goods and services, and/or withdrawing money, thereby improving people's lives (Iman, 2018; Rahman et al., 2020).

Much research has been undertaken to understand m-payment in different contexts (e.g., Lu et al. (2017) in China; Lin et al. (2017) in the United States; Sinha et al. (2019) in India; Oliveira et al. (2016) in Portugal). However, few studies have been conducted in the African context (Chen and Li, 2017; Lin et al., 2017). Previous literature has used different theoretical models to understand continuance intention to use m-payment. Shao et al. (2019) used trust and innovation diffusion theory; Lu et al. (2017) used expectation-confirmation theory, mobility, privacy protection, social influence, and cultural values; Chen and Li (2017) used IT continuance, risk-trust, and affect-

cognition literature. With the exception of two studies that integrated quality factors to understand continuance intention of m-payment (T. Zhou, 2013, 2014b), our study shows how important it is to combine DeLone and McLean information system (D&M IS) success model, and expectation-confirmation model (ECM). Each model has strengths and weaknesses, and these are offset and complemented by combining these two models. Despite the benefits of m-payment, there are still barriers to the continuance use. Many users remain concerned about individual performance and the quality of services, since the m-payment service involves transaction information that affects user privacy. It is important that the users feel confident about m-payment, realize that the service is of quality, that it contains useful information and that they feel the need to use more and more.

Earlier studies addressed similar issues (Fan et al., 2018a; Shao et al., 2019; T. Zhou, 2011b, 2013), but did not integrate a model that can explain different qualities of m-payment, satisfaction, and perceived individual performance to understand continuance intention of m-payment. Considering the impact of m-payment in the African context, due to the lack of access to technology in the same proportion, a service that can be used anytime and anywhere, regardless of the education and economic level, reducing the need to use banks is of great importance (Pal et al., 2020). The context can challenge the theoretical models to explain m-payment. Based on these reasons, we approached the research question (RQ): How do the individual performance drivers influence the continuance intention to use m–payment in an African context? In this sense, it is in our interest to understand the effects of individual performance drivers combined with the ECM on m-payment. We joined two well-established models, the D&M IS success model (DeLone and Mclean, 2003) and ECM (A Bhattacherjee, 2001) to investigate continuance intention to use m-payment and gain a holistic view of the quality of service and individual performance on continuance intention.

The current research contributes to the literature firstly by combining the D&M IS success model with the ECM model with the aim of improving the understanding of continuance intention to use m–payment, identifying important determinants. As per previous research, this would be the first study to combine all the factors of D&M IS success model and ECM model with the purpose to understand continuance intention

to use m–payment. Secondly, considering that the African market is developing, this research will benefit people and companies that are developing IT related to m-payment by identifying the most important factors that can lead to end-user's long-term usage. Thirdly, by addressing the factors of individual's continuance intention to use m-payment, the study deepens knowledge, about what is important to the long–term usage of an IS (A Bhattacherjee, 2001).

The next section presents the bibliographic review. Section 3 outlines the hypotheses and the research model. Section 4 describes the research methodology. Data analyses and results of research are presented in Section 5. Finally, the discussion and conclusions are detailed in Sections 6 and 7, respectively.

3.2. Literature review

3.2.1. Mobile Payment

M-payment is a type of payment that can be performed by mobile devices (such as mobile phones, smartphones, etc.), to pay for goods, services, and bills. They use wireless technologies (mobile phone networks, NFI, Bluetooth, RFID, etc.) to perform transactions (Kaur et al., 2020; Kujala et al., 2017; Liébana-cabanillas et al., 2014, 2018; F. Liébana-Cabanillas and Lara-Rubio, 2017; J. K. Park et al., 2019). Other authors refer to m-payment as a service to carry out payment, check balances, and transfer money in a simple way, anytime and anywhere (Pal et al., 2020; T. Zhou, 2013, 2014b). There are different ways to conduct a transaction using m-payment, the simplest is based on using short-messages with a simple mobile phone whereby the user can check balances or conduct payments using short messages (Luna et al., 2019; Zhou, 2013). Another method is by using NFC (near field communication), communication is established by the proximity of two devices, and the transaction is made (de Luna et al., 2019; Kujala et al., 2017; Francisco Liébana-Cabanillas et al., 2019). The most sophisticated means is by using a mobile application (app), the user downloads the app, installs it on a smartphone, and registers to start using the app (Singh et al., 2020; Verkijika, 2020).

M-payment continuance intention was studied by Lu et al. (2017), who applied mobility, privacy protection, and social influence, and concluded that post-usage privacy protection and social influence belief impact users' intentions to continue using m-payment. Yu et al. (2018) applied trust transfer theory, perceived similarity, and entitativity, and determined that satisfaction is an important predictor influencing m-payment continuance intention, and that the trust transfer process positively influences continuance intention through satisfaction. Zhou (2013) used information systems success and flow theory, and posited that flow, satisfaction, and trust influence continuance intention; and m-payment providers need to offer a quality system, information, and service to guarantee long-term usage. Chen and Li (2017) applied IT continuance, risk-trust, and affect-cognition, and concluded that satisfaction and postadoption perceived usefulness positively influence continuance intention of m-payment. In general, most previous studies focused on trust and satisfaction of the m-payment continuance intention (J. Lu, Wei, et al., 2017; Tam et al., 2020; T. Zhou, 2012, 2014b), but quality and performance also play an important role in m-payment continuance usage.

3.2.2. Mobile payment in an African context

In an African context, telecommunication companies (Safaricom) launched m-payment (M-Pesa) in Kenya in 2007 (Jack and Suri, 2011; Wenner et al., 2018). Kenyans consolidated the usefulness of this technology (Omigie et al., 2017; Uwamariya and Loebbecke, 2020). The technology then grew exponentially and spread across the continent, and is now being used in more than five African countries and has more than 29 million active users (Vodafone Group, 2016; Wenner et al., 2018).

M-payment was adopted in Mozambique and grew rapidly, considering that this service is an alternative to bank-based systems for the population to access financial services. Using simple short messages, users can perform a transaction to transfer money, and pay for goods and services. This service was introduced by the Mozambican Telecommunication Company MCel (mKesh) and by Vodacom (M-Pesa) (Ortigão et al., 2015). Batista and Vicente (2018) found that m-payment is very important in rural areas to increase financial inclusion. Jack and Suri (2011) argued that m-payment

spread very quickly because it is an alternative banking service and has substantial impact on people in low economic conditions. Tobbin and Kuwornu (2011) argued that perceived ease of use and perceived usefulness are the most important factors of behavioural intention to use m-payment in Ghana. Humbani and Wiese (2018) show that convenience and compatibility positively influence the adoption of m-payment. Additionally, they demonstrated that only gender could moderate the relationship between convenience and the adoption of m-payment.

3.2.3. Theoretical models

3.2.3.1. DeLone and McLean IS success model

The DeLone and McLean IS success model has been broadly used to explain individual and organizational performance (DeLone and McLean, 1992). However, in this study, the focus is on the individual level. The D&M IS model explains that (1) both quality system and information quality significantly influence the use of IS and user satisfaction, (2) the use of IS influences the user's satisfaction and vice versa, (3) both use and satisfaction significantly influence individual performance, and (4) individual performance significantly influences organizational impact. Several studies confirm that this model is powerful to explain individual performance and can be used with other models or variables (Baabdullah et al., 2019; Sharma and Sharma, 2019). Tam and Oliveira (2016) employed it to understand the impact of mobile banking; Hsu et al. (2014) used the model to explain the repurchase intention on online group-buying; Wang (2008) applied it to explain the impact of e-commerce system success.

After ten years DeLone and Mclean (2003) reviewed several papers that validate, challenge, and propose improvements to the original model, and proposed an updated model. In the updated model they include the fact that service quality significantly influences the use of the system and satisfaction. They realized that with the growth of IS, users started paying attention to the quality of services (Tam and Oliveira, 2016). Concerning the impact, in the updated model, they realized that other studies have proposed several types of impacts and decided to join all the impacts into a single

impact called net benefits. Considering that the proposed model is based on the individual level, the individual performance will also be used.

3.2.3.2. Information System Continuance Model

There are several theories used in studies related to information systems, such as the unified theory of acceptance and usage of technology (UTAUT), the technology acceptance model (TAM), and the task-technology fit (TTF). Our interest is based on the post-adoption theoretical model of IS, at the individual level. There is a difference between adoption and continuance intention of IS. Adoption refers to factors that explain why an individual adopts or rejects a technology (Humbani and Wiese, 2019; Straub, 2009). At this stage, the users have their first contact with the technology, and depending on their experience, they decide whether to use it or to reject it. Continuance intention refers to factors that explain why an individual uses a technology for a long time, thus contributing to the continued use of the technology (Franque et al., 2020; X. Lin et al., 2017). It involves understanding the long-term factors that contribute to the success of the IS (A Bhattacherjee, 2001; X. Lin et al., 2017).

Despite the merit of previous studies that applied adoption theories such as UTAUT and TAM to explain continuance intention (Hadji and Degoulet, 2016; Joo et al., 2016; Wu and Chen, 2017), the application of these models may suffer from some limitations, leading to misunderstandings and misapplications of these theories (Bhattacherjee and Barfar, 2011; Franque et al., 2020; Nabavi et al., 2016). The ECM model was based on the expectation-confirmation theory of Oliver (1986). The model explains that (1) continuance intention to use IS was strongly anticipated by user satisfaction, followed by users' perceived usefulness of the system, (2) user satisfaction was predicted by users' confirmation of perceived usefulness and expectation, and (3) user confirmation of expectation was a significant predictor of users' perceived usefulness. The model was extensively tested in IS research and confirmed to be a good model to explain continuance intention (Carillo et al., 2017; Ryu, 2018; Talwar et al., 2020; Wang et al., 2019; Zheng, 2019). Users' satisfaction is the best factor to improve the continuance

intention-behaviour to use IS, and before users decide to continue using, satisfaction and positive attitude are essential (A Bhattacherjee, 2001).

Most research on IS continuance intention was based on the ECM model. Shiau et al., 2020 used it to explain fintech; Susanto et al. (2016) used it to explain smartphone banking services; Lee (2010) applied it to explain e-learning; Alraimi et al. (2015) utilized it to explain MOOCs; and Gao et al. (2015) used the model to explain mobile purchase. To the best of our knowledge, ECM and the D&M IS success model have users' satisfaction as the strongest factor of individual performance and continuance intention.

3.2.3.3. Joint model of D&M IS success and ECM

The model proposed is based on ECM (A Bhattacherjee, 2001). Bhattacherjee (2001) asserted that the model provides a better contribution to continuance intention to use IS. As can be seen in the literature, some studies guided their research based on ECM (Shiau et al., 2020; Susanto et al., 2016). The ECM model focuses on three cognitive feelings (satisfaction, perceived usefulness, and expectation of confirmation). However, it does not include other constructs that may express additional feelings, such as quality of service, performance, and usage, among others. To address this absence, different studies integrated others models and factors to explain different phenomena (Gao et al., 2015; Humbani and Wiese, 2019; B. Wu and Chen, 2017). Based on the suggestions of Bhattacherjee (2001) and Bhattacherjee and Lin (2014), that their models should be considered in different environments and technologies, and with other factors, the present study combines D&M IS success model and ECM to understand m-payment.

3.3. Research model and hypotheses

The aim of this study is to understand continuance intention of m-payment, using the post-acceptance model ECM, which states that satisfaction and perceived usefulness are the main factors supported by the confirmation of expectations (A Bhattacherjee, 2001). The addition of other models or constructs will provide a better understanding

of the long-term usage of m-payment. Thus, we integrated the D&M IS success model that asserts that the quality of services, system, and information predict satisfaction and use, which consequently influence individual performance. Thus, the theoretical model proposed (Fig. 3.1) to understand continuance intention to use m-payment states that:

1. The quality of service, system, and information determine confirmation, satisfaction, and use of m-payment.
2. Confirmation of expectation directly influences satisfaction and perceived usefulness of m-payment.
3. The use directly determines satisfaction, individual performance, and continuance intention.
4. Satisfaction directly influences individual performance and continuance intention.
5. Perceived usefulness directly influences satisfaction and continuance intention.
6. Individual performance directly determines continuance intention.

The corresponding hypotheses are discussed below.

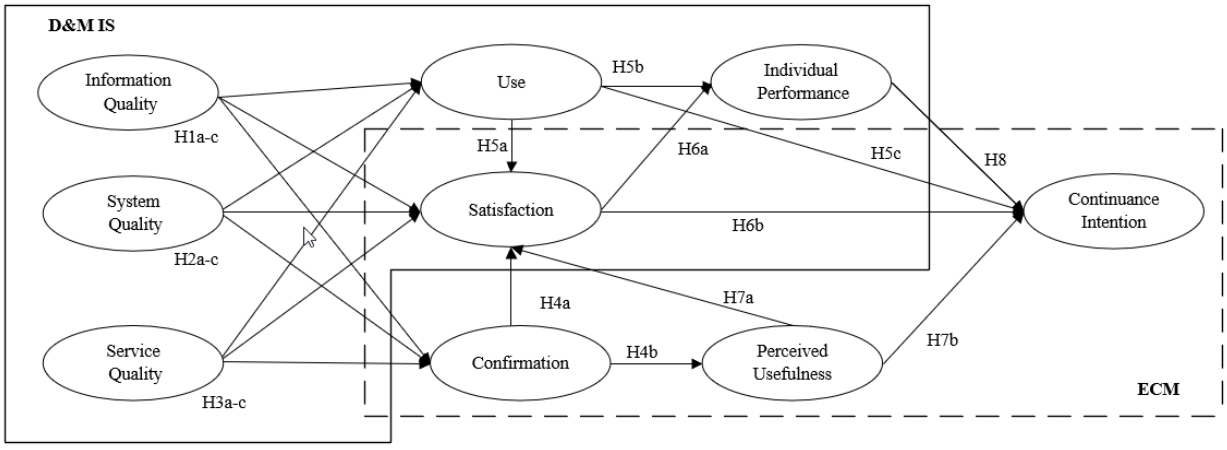

Figure 3.1 - Research model. Notes: ECM: Expectation Confirmation Model; D&M IS: DeLone and McLean information system success.

Information quality reflects the relevance, sufficiency, precision, and punctuality of information. However, users start and continue using m-payment when they find relevant, accurate, and up-to-date information. Information quality may also influence users' satisfaction (Cidral et al., 2018). In contrast, poor information quality can

decrease users' satisfaction as they expect to obtain reliable, relevant, and timely information from m-payment systems (Gao et al., 2015). When users start using IS, they have initial expectations, and during the acceptance process, the level of expectation increases or decreases. However, information quality may positively influence the confirmation of expectation. For Tam and Oliveira (2016) information quality plays an important role in explaining user satisfaction of using mobile banking. Zhang et al. (2017) report that high information quality content improves the user satisfaction of virtual learning community services.

H1a. The quality of the information positively influences the use of m-payment.

H1b. The quality of the information positively influences the user satisfaction of m-payment.

H1c. The quality of the information positively influences the confirmation of m-payment.

DeLone and McLean (1992) introduced system quality, presenting it as the overall quality performance of the system, and that it is measured by the perceptions of the individual. System quality represents access speed, good connection, navigation, and ease of use (Cidral et al., 2018; Gao et al., 2015). The m-payment service provider that accommodates the above characteristics and users' perceived quality of the system may increase the level of expectation, easing the use of m-payment services. Furthermore, system quality may improve the use and user satisfaction of m-payment. Confirming users' initial expectations may influence long-term usage of m-payment.

H2a. System quality positively influences the use of m-payment.

H2b. System quality positively influences user satisfaction of m-payment.

H2c. System quality positively influences confirmation of m-payment.

Service quality reflects assurance, personalization, reliability, and responsiveness. This means that when users perceive reliable service, and when the m-payment service

provider is always willing to support users when needed, user expectations will be confirmed, and they will continue using the system (Tam and Oliveira, 2016). The m-payment service provider must ensure quality of the service to increase the users' satisfaction and the trustworthiness of the service, and consequently continuance use of m-payment (Gao et al., 2015). In the acceptance process, positive expectations help users to adopt the IS. Therefore, service quality plays a crucial role to confirm user expectations.

H3a. Service quality positively influences the use of m-payment.

H3b. Service quality positively influences the user satisfaction of m-payment.

H3c. Service quality positively influences the confirmation of m-payment.

Confirmation refers to users' assessment toward a product, service, or technology. Users make their assessment when comparing their initial expectations with the performance of the product, service, or technology. When they achieve their initial expectations, they have positive confirmation; when the initial expectations are not achieved, they have negative confirmation (Alraimi et al., 2015; Oghuma et al., 2016). Confirmation of expectation in m-payment services usage will increase the satisfaction of the users and the perceived usefulness of the service (Susanto et al., 2016).

H4a. Confirmation positively influences user satisfaction of m-payment.

H4b. Confirmation positively influences perceived usefulness of m-payment.

The use of m-payment service begins to be frequent when users perceive dependence of the service or system, when they perceive no effort to use it, and when they start perceiving performance outcomes (Chang et al., 2014). When the use of m-payment services starts to become automatic, and users use it frequently, and they start perceiving the individual performance of the service or system, satisfaction increases.

H5a. The use of m-payment positively influences the satisfaction of users.

H5b. The use of m-payment positively influences the individual performance of users.

H5c. The use of m-payment positively influences users' continuance intention.

Satisfaction reflects comfortable feelings by an individual using m-payment services, because of the usage experiences and performance outcomes, meaning that satisfaction starts to become stronger after users adopt the service or system (Bhattacherjee and Lin, 2014). When users are satisfied with the service, the long-term relationships become stronger (Yu et al., 2018). Many papers confirm that satisfaction is the best predictor to improve the continuance intention of any system and to motivate users to perceive the individual performance of the service or system (Carillo et al., 2017; Cho, 2016; Mouakket, 2015; Yu et al., 2018).

H6a. User satisfaction positively influences the individual performance of m-payment.

H6b. User satisfaction positively influences the continuance intention to use m-payment.

Perceived usefulness is the degree to which individuals start to understand the advantages in terms of usage of the IS (Davis, 1989). This means that when users perceive the benefits of the service or system utilization, the long-term relationship is reinforced (M.-C. Lee, 2010; Rezvani et al., 2017). Perceived usefulness is very important for m-payment because users perceive the benefits, and the utilization of the system becomes more frequent. Perceived usefulness strongly influences continuance intention to use m-payment services. Earlier research shows that perceived usefulness is very important to satisfaction and increases the intention to continue using IS (Cho, 2016; Joo et al., 2018; Shin et al., 2017).

H7a. Perceived usefulness positively influences user satisfaction of m-payment.

H7b. Perceived usefulness positively influences continuance intention to use m-payment.

Individual performance is the degree to which an individual perceives that IS enables him or her to accomplish tasks more easily and quickly (DeLone and Mclean, 2003). It suggests that individuals use IS if they perceive that it is useful to their activities (Tam and Oliveira, 2016). Individual performance reinforces the behaviour to continue using an m-payment system because it can be used anytime and anywhere. It the model proposed, individual performance has an important influence on continuance intention, and consequently impacts continuance intention to use m-payment.

H8. Individual performance positively influences continuance intention to use m-payment.

3.4. Methodology

3.4.1. Measurement

As mentioned in the sections above, a theoretical model was used to investigate continuance intention of m-payment. The main method of data collection for this study was an online survey, as it is the quickest and most effective way to collect responses on this subject (Alraimi et al., 2015; Y. P. Chang and Zhu, 2012). A questionnaire was developed for the survey using constructs and items from the literature (Table 3.1). The items measured for information quality, system quality, service quality, and individual performance were adopted from Tam and Oliveira (2016); the items for use were adopted from Venkatesh et al. (2003); the items for satisfaction, confirmation, perceived usefulness, and continuance intention were adopted from Bhattacherjee (2001). The questionnaire was approved by the NOVA IMS Ethics Committee.

Table 3.1 - Measurement items.

Nº	Constructs	Questionnaire Items	Adapted from
1	Information Quality (INFQ)	INFQ1. The information provided by M-Payment is useful. INFQ2. The information provided by M-Payment is understandable. INFQ3. The information provided by M-Payment is interesting. INFQ4. The information provided by M-Payment is reliable.	(Tam & Oliveira, 2016)
2	System Quality (SYSQ)	SYSQ1. M-Payment is easy to navigate. SYSQ2. M-Payment allows me to easily find the information I am looking for. SYSQ3. M-Payment is well structured. SYSQ4. M-Payment is easy to use.	(Tam & Oliveira, 2016)

3	Service Quality (SERQ)	SERQ1. The responsible service personnel are always highly willing to help whenever I need support with the M-Payment. SERQ2. The responsible service personnel provide personal attention when I experience problems with the M-Payment. SERQ3. The responsible service personnel provide services related to M-Payment at the promised time. SERQ4. The responsible service personnel have enough knowledge to answer my questions with respect to M-Payment.	(Tam & Oliveira, 2016)
4	Use (U)	U1. I use M-Payment. U2. I use M-Payment to buy products and services. U3. I use M-Payment to make transfers. U4. I use M-Payment to withdraw money.	(Venkatesh, 2003)
5	Satisfaction (S)	S1. I am very pleased to use M-Payment. S2. I am very happy with M-Payment. S3. I am delighted with M-Payment.	(A Bhattacherjee, 2001)
6	Confirmation (C)	C1. My experience with using M-Payment was better than I expected. C2. The service level provided by M-Payment was better than I expected. C3. Overall, most of my expectations from using M-Payment were confirmed.	(A Bhattacherjee, 2001)
7	Perceived Usefulness (PU)	PU1. Using M-Payment improves my performance. PU2. Using M-Payment increases my productivity. PU3. Using M-Payment enhances my effectiveness. PU4. I find M-Payment to be useful for my work.	(A Bhattacherjee, 2001)
8	Individual Performance (IP)	IP1: M-Payment enables me to accomplish tasks more quickly. IP2: M-Payment makes it easier to accomplish tasks. IP3: M-Payment is useful for my job.	(Tam & Oliveira, 2016)
9	Continuance Intention (CI)	CI1. I intend to continue using M-Payment rather than discontinue its use. CI2. My intentions are to continue using M-Payment rather than manual processing or other alternative means. CI3. I plan to continue using M-Payment in my job.	(A Bhattacherjee, 2001)

3.4.2. Data

Data were collected from June 2018 to October 2018. The items were assessed on a seven-point scale, ranging from one (totally disagree) to seven (totally agree). The question was created and managed in English and revised for content validity by a language expert. Nevertheless, a professional translator translated the questionnaire into Portuguese to adjust it to the Mozambican context. The questionnaire was reverse translated to English by a different translator to ensure equivalence (Brislin, 1970). To validate the instruments, a pilot test was conducted on a group of 40 students, who were excluded from the main sample. Given that the goal of this study is to investigate continuance intention to use m-payment, the target respondents should have experience in using m-payment. To ensure this, the valid respondents in the Mozambican context were confined to M-Pesa and Mkesh users. The survey was sent to the respondents, providing a hyperlink for the questionnaire. We received 338 valid responses by the end of October 2018 from the 900 e-mails sent, which corresponds to a 37.5% response rate. We tested the sample distributed to the first and second respondent groups using

the Kolmogorov-Smirnov (K-S) test and confirmed that they do not differ statistically (Ryans, 1974), showing that non-response bias was not present. The common method bias was also examined using Harman's test (Podsakoff et al., 2003) confirming no significant common method bias in the data.

The characteristics of the sample are shown in Table 3.2; 60% of the respondents were men, 42% of the respondents had used m-payment one (1) to four (4) times during the last 3 months.

Table 3.2 - Sample characteristics.

Age		
< 25	119	35%
25 - 30	96	28%
31 - 40	76	22%
41 - 50	38	11%
> 50	9	3%
Gender		
Female	134	40%
Male	204	60%
Education		
High school or below	83	25%
Bachelor's degree	151	45%
Master's degree or higher	104	31%
Employment		
Students	95	28%
Working professionals	203	60%
Retired	1	0%
Unemployed	39	12%
Marital status		
Single	162	48%
Married	74	22%
Divorced	23	7%
Widowed	10	3%
Common-law marriage (cohabitation)	67	20%
Do not know answers	2	1%
M-payment usage frequency (time / 3 months)		
1 - 4	143	42%
5 - 10	92	27%
> 10	103	30%

3.5. Data analysis and results

Structural equation modeling (SEM) with partial least square (PLS) was used to test and assess the validity of the theoretical model. Previous research has recognized the potential of SEM for measuring structural models (Alraimi et al., 2015; Tam and Oliveira, 2016). SEM is a set of statistical models used to assess the validity of theories with empirical data (Ringle et al., 2005). Additionally, the Kolmogorov–Smirnov (K-S test) was implemented, as it is used in cases where data are not usually distributed, and the research model is complex and has not been tested in the literature. Thus, PLS is the appropriate method for this research. Smart PLS 3 software (Ringle et al., 2015) was used to analyse the theoretical model relationships.

3.5.1. Measurement model

The results of the measurement model are presented in Tables 3.3 and 3.4. The results of composite reliability (CR) are greater than 0.70, indicating that the model has good internal consistency. To assess the indicator reliability, we considered a loading greater than 0.70. The instruments present a good indicator reliability. Average variance extracted (AVE) was used to test convergent validity. AVE should be greater than 0.50 so that the latent variables explain more than half of the variance of their indicators (Fornell and Larcker, 1981; Hair Jr et al., 2016; Henseler et al., 2009).

Table 3.3 - Measurement model.

Construct	AVE	Composite Reliability	Cronbach's Alpha	Item	Loadings	t-value
Information Quality (INFQ)	0.652	0.882	0.822	INFQ1	0.829	38.958
				INFQ2	0.851	44.922
				INFQ3	0.809	40.380
				INFQ4	0.737	17.910
System Quality (SYSQ)	0.628	0.871	0.801	SYSQ1	0.736	17.964
				SYSQ2	0.839	32.255
				SYSQ3	0.837	42.697
				SYSQ4	0.753	20.061
Service Quality (SERQ)	0.617	0.865	0.792	SERQ1	0.725	15.049
				SERQ2	0.824	30.969
				SERQ3	0.818	31.505
				SERQ4	0.771	23.059
Use (U)	0.595	0.855	0.773	U1	0.781	27.522
				U2	0.745	21.760
				U3	0.792	22.677
				U4	0.767	23.880
Satisfaction (S)	0.690	0.870	0.776	S1	0.850	48.015
				S2	0.833	40.310
				S3	0.809	27.531
Confirmation (C)	0.623	0.832	0.697	C1	0.777	21.874
				C2	0.824	32.682
				C3	0.765	24.587
Individual performance (IP)	0.630	0.836	0.705	IP1	0.782	27.527
				IP2	0.846	39.725
				IP3	0.751	18.229
Perceived Usefulness (PU)	0.575	0.844	0.753	PU1	0.729	17.764
				PU2	0.813	35.602
				PU3	0.778	25.344
				PU4	0.709	15.089
Continuance Intention (CI)	0.525	0.812	0.695	CI1	0.757	22.151
				CI2	0.769	20.020
				CI3	0.807	41.005

Note: AVE: Average variance extracted.

Table 3.4 - Latent construct correlations and square roots of AVEs.

	Mean	STDEV	INFQ	SYSQ	SERQ	U	S	C	IP	PU	CI
INFQ	4.869	1.123	**0.807**								
SYSQ	4.813	1.123	0.608	**0.793**							
SERQ	4.247	1.166	0.247	0.284	**0.785**						
U	4.693	1.154	0.509	0.395	0.349	**0.771**					
S	4.464	1.165	0.524	0.432	0.361	0.566	**0.831**				
C	4.330	1.102	0.498	0.413	0.396	0.510	0.640	**0.789**			
IP	4.545	1.055	0.384	0.390	0.257	0.415	0.333	0.397	**0.794**		
PU	4.464	1.085	0.446	0.327	0.329	0.495	0.530	0.566	0.485	**0.758**	
CI	4.481	0.986	0.389	0.342	0.288	0.496	0.426	0.439	0.481	0.386	**0.724**

Notes: Values in bold are the square root of the average variance extracted; STDEV: Standard deviation; INFQ: Information Quality; SYSQ: System Quality; SERQ: Service Quality; U: Use; S: Satisfaction; C: Confirmation; IP: Individual performance; PU: Perceived Usefulness; CI: Continuance Intention.

As seen in Table 3.3, all the constructs meet these criteria, ensuring convergence. This shows that the constructs can be used to assess the theoretical model. Discriminant validity was measured using Fornell-Larcker criterion (Table 3.4), cross-loadings criterion (Table 3.5), and the heterotrait-monotrait ratio of correlations (HTMT) (Table 3.6). Table 3.4 reports the square root of the AVE in bold along the diagonal, and the correlations between the constructs. Based on Fornell and Larcker (1981) criterion, the square root of the AVE should be greater than the correlation between the constructs, and thus the constructs fulfil the criterion. To ensure the discriminant validity, each item presents a higher loading on its corresponding factor than in the cross-loading (Chinn, 1998; Götz et al., 2010). Based on HTMT (Table 3.6) it can be seen that all the values are below 0.90, and it therefore can be concluded that there is discriminant validity (Henseler et al., 2015). The measurement model findings indicate that the model has a good internal consistency, reliability indicator, convergence validity, and discriminant validity, illustrating that the constructs are statistically different and can be used to assess the structural model.

Table 3.5 - Cross loadings.

	INFQ	SYSQ	SERQ	U	S	C	IP	PU	CI
INFQ1	**0.829**	0.427	0.185	0.476	0.461	0.428	0.359	0.411	0.329
INFQ2	**0.851**	0.541	0.166	0.440	0.440	0.385	0.364	0.369	0.354
INFQ3	**0.809**	0.516	0.222	0.379	0.434	0.420	0.312	0.408	0.327
INFQ4	**0.737**	0.490	0.234	0.334	0.346	0.371	0.183	0.231	0.235
SYSQ1	0.469	**0.736**	0.230	0.314	0.328	0.277	0.269	0.199	0.198
SYSQ2	0.477	**0.839**	0.255	0.306	0.385	0.339	0.326	0.264	0.293
SYSQ3	0.483	**0.837**	0.242	0.302	0.360	0.343	0.332	0.321	0.312
SYSQ4	0.499	**0.753**	0.171	0.332	0.293	0.346	0.306	0.247	0.277
SERQ1	0.245	0.278	**0.725**	0.251	0.289	0.319	0.174	0.275	0.216
SERQ2	0.172	0.208	**0.824**	0.295	0.283	0.331	0.229	0.271	0.265
SERQ3	0.176	0.168	**0.818**	0.282	0.287	0.297	0.170	0.232	0.195
SERQ4	0.183	0.239	**0.771**	0.268	0.275	0.296	0.235	0.253	0.226
U1	0.426	0.325	0.316	**0.781**	0.402	0.357	0.346	0.353	0.438
U2	0.386	0.292	0.219	**0.745**	0.406	0.381	0.308	0.421	0.425
U3	0.354	0.248	0.255	**0.792**	0.436	0.408	0.308	0.337	0.318
U4	0.400	0.346	0.282	**0.767**	0.498	0.426	0.316	0.414	0.349
S1	0.495	0.415	0.332	0.585	**0.850**	0.502	0.315	0.445	0.368
S2	0.432	0.348	0.267	0.435	**0.833**	0.545	0.259	0.469	0.367
S3	0.372	0.307	0.299	0.378	**0.809**	0.552	0.252	0.407	0.325
C1	0.341	0.294	0.294	0.402	0.561	**0.777**	0.352	0.456	0.341
C2	0.446	0.369	0.349	0.417	0.497	**0.824**	0.341	0.456	0.375
C3	0.390	0.312	0.294	0.387	0.454	**0.765**	0.241	0.426	0.321
IP1	0.309	0.286	0.234	0.356	0.318	0.354	**0.782**	0.369	0.389
IP2	0.295	0.333	0.181	0.330	0.249	0.278	**0.846**	0.375	0.403
IP3	0.312	0.309	0.198	0.301	0.223	0.314	**0.751**	0.414	0.351
PU1	0.388	0.227	0.230	0.347	0.420	0.468	0.322	**0.729**	0.249
PU2	0.323	0.234	0.260	0.410	0.375	0.466	0.380	**0.813**	0.325
PU3	0.312	0.283	0.275	0.344	0.431	0.395	0.395	**0.778**	0.335
PU4	0.333	0.252	0.230	0.402	0.386	0.381	0.377	**0.709**	0.258
CI1	0.310	0.261	0.231	0.389	0.312	0.339	0.380	0.337	**0.757**
CI2	0.276	0.271	0.175	0.367	0.334	0.317	0.319	0.274	**0.769**
CI3	0.359	0.316	0.248	0.431	0.373	0.364	0.462	0.296	**0.807**

Notes: Indicator loading (in bold) greater than all its cross-loadings; INFQ: Information Quality; SYSQ: System Quality; SERQ: Service Quality; U: Use; S: Satisfaction; C: Confirmation; IP: Individual performance; PU: Perceived Usefulness; CI: Continuance Intention.

Table 3.6 - Heterotrait-monotrait ratio of correlations (HTMT).

	INFQ	SYSQ	SERQ	U	S	C	IP	PU	CI
INFQ									
SYSQ	0.755								
SERQ	0.311	0.357							
U	0.631	0.500	0.444						
S	0.648	0.544	0.460	0.721					
C	0.657	0.551	0.533	0.694	0.871				
IP	0.497	0.519	0.345	0.561	0.447	0.564			
PU	0.561	0.422	0.426	0.650	0.695	0.778	0.670		
CI	0.487	0.433	0.386	0.658	0.563	0.623	0.656	0.527	

Notes: INFQ: Information Quality; SYSQ: System Quality; SERQ: Service Quality; U: Use; S: Satisfaction; C: Confirmation; IP: Individual performance; PU: Perceived Usefulness; CI: Continuance Intention.

3.5.2. Structural model

After the validation of the measurement model, the structural model was analysed for hypotheses and constructs testing. Figure 3.2 presents the research results. The structural model assessment used 5000 bootstrap resamples to estimate the path significance level of the model (Henseler et al., 2009). The VIF (variance inflation factor) was also tested to assess the multicollinearity. All of the constructs are below the threshold of 5, indicating the absence of multicollinearity between the constructs (Hair Jr. et al., 2016).

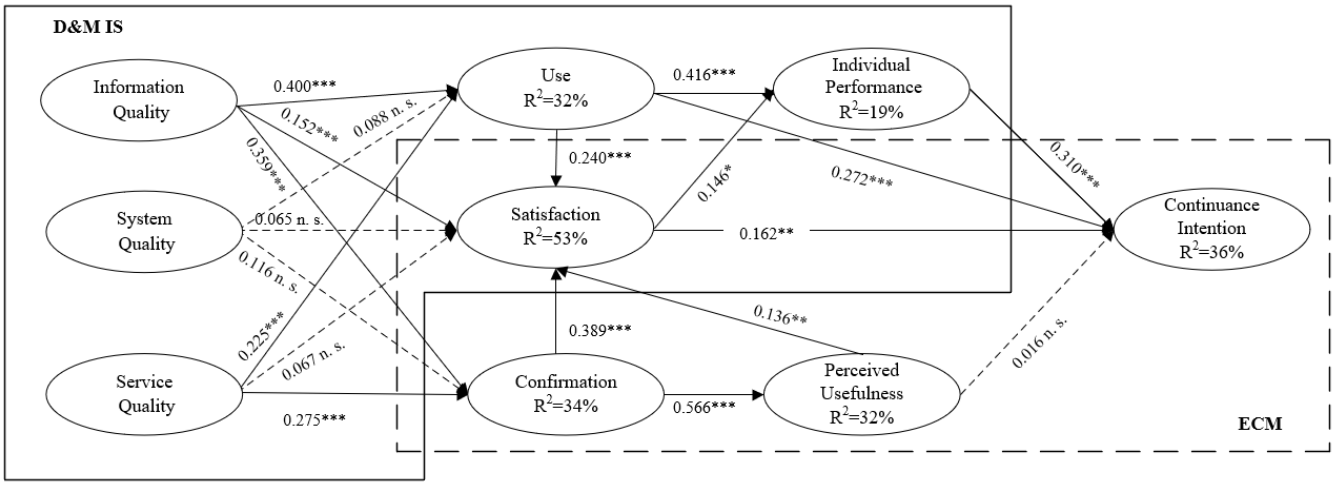

Figure 3.2 - Research model. Notes: Integration of Expectation Confirmation Model (ECM) and DeLone and McLean information system success (D&M IS); (*** p < 0.01; ** p < 0.05; * p < 0.10).

The model explains 32% of the variation in the use of m-payment. The information quality ($\hat{\beta}$ = 0.400, p < 0.01) and service quality ($\hat{\beta}$ = 0.225, p < 0.01) are statistically significant in explaining use, thus confirming H1a and H3a. The system quality is not statistically significant in explaining use, and thus hypothesis H2a is not confirmed.

The model explains 53% of the variation in satisfaction in using m-payment. The information quality ($\hat{\beta}$ = 0.152, p < 0.01), confirmation ($\hat{\beta}$ = 0.389, p < 0.01), use ($\hat{\beta}$ = 0.240, p < 0.01), and perceived usefulness ($\hat{\beta}$ = 0.136, p < 0.05) are statistically significant in explaining satisfaction, thus confirming H1b, H4a, H5a, and H7a. System quality and service quality are not statistically significant in explaining satisfaction, and thus hypotheses H2b and H3b are not confirmed.

The model explains 34% of the variation in confirmation of m-payment. Information quality ($\hat{\beta}$ = 0.359, p < 0.01) and service quality ($\hat{\beta}$ = 0.275, p < 0.01) are statistically significant in explaining confirmation, thus confirming H1c and H3c. System quality is not statistically significant, and thus hypothesis H2c is not confirmed.

The model explains 32% of variation in perceived usefulness of m-payment. Confirmation ($\hat{\beta}$ = 0.566, p < 0.01) is statistically significant in explaining perceived usefulness, thus confirming H4b.

The model explains 19% of variation in individual performance. Use ($\hat{\beta}$ = 0.416, p < 0.01) and satisfaction ($\hat{\beta}$ = 0.146, p < 0.1) are statistically significant in explaining individual performance, therefore confirming H5b and H6a.

36% of the variation is explained by the model in continuance intention to use m-payment. Use ($\hat{\beta}$ = 0.272, p < 0.01), individual performance ($\hat{\beta}$ = 0.310, p < 0.01), and satisfaction ($\hat{\beta}$ = 0.270, p < 0.01) are statistically significant in explaining continuance intention, therefore confirming H5c, H6b, and H8. Perceived usefulness is not statistically significant, and thus hypothesis H7b is not confirmed.

The strongest relationships were confirmation on perceived usefulness ($\hat{\beta}$ = 0.566), use on individual performance ($\hat{\beta}$= 0.416), information quality on use ($\hat{\beta}$= 0.400), and confirmation on satisfaction ($\hat{\beta}$ = 0.389).

3.6. Discussion

The model proposed is a combination of the D&M IS success model (DeLone and Mclean, 2003) and the ECM (A Bhattacherjee, 2001), to explain continuance intention to use m-payment. Based on the findings (see Table 3.7), of 19 hypotheses 14 were confirmed and 5 were not. Therefore, we can argue that most of the hypothesized relationships were confirmed. Individual performance is the strongest predictor of continuance intention, followed by use and satisfaction. Information quality and service quality determine confirmation. Information quality, use, confirmation, and perceived usefulness determine users' satisfaction. Use is explained by information and service quality. Individual performance is explained by use and satisfaction of m-payment. Perceived usefulness is explained by confirmation. Surprisingly, service quality does not explain satisfaction, perceived usefulness does not explain continuance intention, and system quality explains none of the proposed relationships.

Table 3.7 - Hypotheses results.

Hypothesis	Independent Construct	→	Dependent construct	Findings (β)	P value	Conclusion
H1a	Information Quality	→	Use	0.400	0.000	Supported
H1b	Information Quality	→	Satisfaction	0.152	0.008	Supported
H1c	Information Quality	→	Confirmation	0.359	0.000	Supported
H2a	System Quality	→	Use	0.088	0.235	Not supported
H2b	System Quality	→	Satisfaction	0.065	0.261	Not supported
H2c	System Quality	→	Confirmation	0.116	0.140	Not supported
H3a	Service Quality	→	Use	0.225	0.001	Supported
H3b	Service Quality	→	Satisfaction	0.067	0.163	Not supported
H3c	Service Quality	→	Confirmation	0.275	0.000	Supported
H4a	Confirmation	→	Satisfaction	0.389	0.000	Supported
H4b	Confirmation	→	Perceived Usefulness	0.566	0.000	Supported
H5a	Use	→	Satisfaction	0.240	0.000	Supported
H5b	Use	→	Individual performance	0.416	0.000	Supported
H5c	Use	→	Continuance Intention	0.272	0.000	Supported

H6a	Satisfaction	→	Individual performance	0.146	0.071	Supported
H6b	Satisfaction	→	Continuance Intention	0.162	0.018	Supported
H7a	Perceived Usefulness	→	Satisfaction	0.136	0.025	Supported
H7b	Perceived Usefulness	→	Continuance Intention	0.016	0.834	Not supported
H8	Individual performance	→	Continuance Intention	0.310	0.000	Supported

The results indicate that information quality positively influences use (H1a), satisfaction (H1b), and confirmation (H1c) of m-payment. The results of H1a and H1b are consistent with those of Tam and Oliveira (2016) and Cidral et al. (2018), who assert that information quality positively influences use and satisfaction. This means that when m-payment provides information with quality, it positively impacts the usage, satisfaction, and confirmation of the expectation of m-payment (Chang et al., 2014; Cheng, 2014; Cidral et al., 2018). The users may always expect to access comprehensive, accurate, and up-to-date information on the m-payment system. As users understand that the m-payment presents quality information, they will understand that the m-payment provider is maintaining the information up to date, and they will therefore continue using m-payment. If the information is out of date or inaccurate, it will negatively influence the usage, satisfaction, and expectations (Gao et al., 2015).

Our results indicate that system quality did not affect use (H2a), satisfaction (H2b), or confirmation (H2c) of m-payment, indicating that in the post-acceptance phase the quality of the system is not important for the usage, user satisfaction, or the confirmation of the expectations regarding continuance intention of m-payment. This result is not consistent with the findings reported in several studies (Budiardjo et al., 2017; Cidral et al., 2018; Gao et al., 2015). A possible explanation may reside in the fact that users already assume that m-payment works well, and that it is a mature technology. Another reason may be that our study was conducted in a developing economy context, and that the other studies were conducted in developed economies. A third reason may have to do with the technology studied. The other studies applied different technologies such as web-based learning, social cataloguing sites, online learning, etc. (Cidral et al., 2018; Daıhan and Akkoyunlu, 2016; Gao et al., 2015). Furthermore, our results indicate that service quality positively influenced use (H3a) and confirmation (H3c), but not satisfaction (H3b). The result of H3a is contradictory with that of Cidral et al. (2018) and Tam and Oliveira (2016), where the relationship

was not significant. The result of H3b is consistent with Gao et al. (2015) and Cidral et al. (2018). The result of H3c is consistent with Oghuma et al. (2016), who reports that service quality positively influences confirmation. These findings suggest that m-payment providers should be willing to help the users whenever they need support, should provide personal help, and should provide services at the time promised, in order to encourage the usage and facilitate the confirmation of expectation of m-payment.

Confirmation positively influences perceived usefulness (H4a) and user satisfaction (H4b) of m-payment (Alraimi et al., 2015; Oghuma et al., 2016; Tam et al., 2020). This means that the experiences using m-payment were positive and user expectations were confirmed (Cheng, 2014; Tam et al., 2020). While for Park et al. (2017) confirmation does not explain user satisfaction. This situation can occur when the initial experience is negative, and the user's expectation is disconfirmed. Additionally, expectation can be different according to the culture of the country. In the current study the participants belong to a developing economy (Mozambique), whereas in the other studies they belong to a developed economy (South Korea). Our results show that the use of m-payment is an important predictor for individual performance (H5a), user satisfaction (H5b), and continuance intention (H5c). This means that the more users use m-payment the more they will perceive the usefulness of m-payment and increase the feeling of satisfaction, consequently motivating users to continue using m-payment. The results indicate that user satisfaction positively influences individual performance (H6a) and continuance intention (H6b) (Chen and Li, 2017; Cidral et al., 2018; Tam et al., 2020; Yu et al., 2018). Park et al. (2017), found a contradictory result for H6b. The finding indicates that when the user is very happy using m-payment, the satisfaction became an important predictor of continuance intention to use m-payment.

Perceived usefulness positively influences satisfaction (H7a) (Alraimi et al., 2015; Tam et al., 2020) but not continuance intention (H7b) (C. H. Hsiao et al., 2016). This means that when users perceive performance, effectiveness, and benefits in using m-payment, satisfaction of the users will be confirmed, and consequently influence their continuance intention to use m-payment. The results also indicate that individual performance positively influences continuance intention (H8). However, individual performance was the strongest construct to predict continuance intention. This finding suggest that when the m-payment allows the users to accomplish their tasks quickly,

and when the benefits of the m-payment reflect the daily lives of the users, they begin to feel the intention to continue using m-payment (Morosan and DeFranco, 2016; Zhou, 2014).

Our findings are that the construct system quality is not significant in any of the relationships tested. To avoid confusion in the interpretation of the model we have redrawn the model (Fig. 3.3) and removed system quality. The results show us that there no significant difference between the original model and the recalculated model without system quality, thus supporting our initial model.

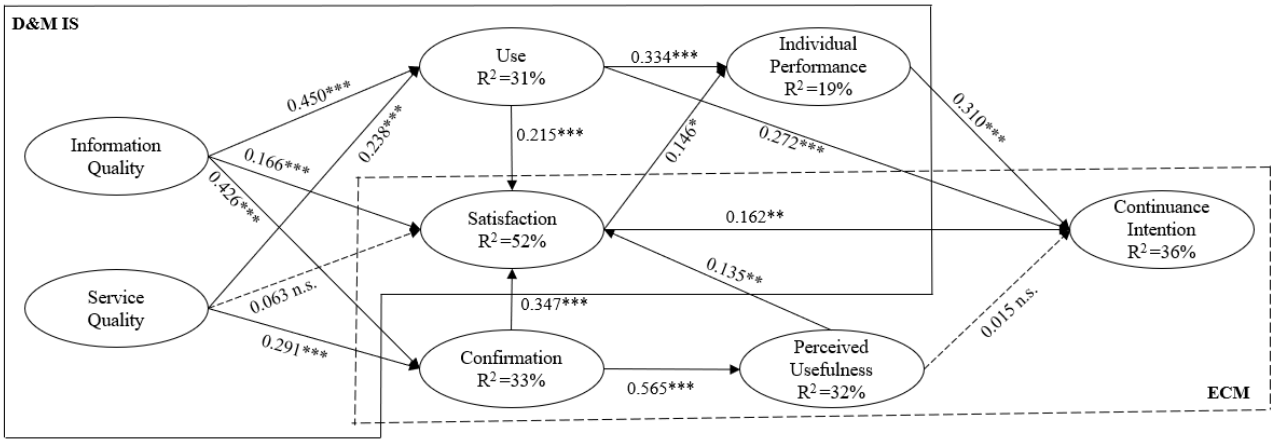

Figure 3.3 - Research model recalculated without system quality. Notes: ECM: Expectation Confirmation Model; D&M IS: DeLone and McLean information system success; (*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$).

3.6.1. Theoretical implications

Based on the D&M IS success and IS continuance models (Bhattacherjee, 2001; DeLone and Mclean, 2003), this study presents a joint model of users' continuance intention to use m-payment. The model here proposed joins the D&M IS success model and the IS continuance model, with the aim of identifying antecedents that focus on satisfaction, individual performance, and continuance intention. The model was proposed and validated empirically in the Mozambican context. The findings provide support for the importance of the added constructs from DeLone and Mclean (2003) in user's continuance intention to use m-payment. Therefore, this foundational

contribution opens the door for additional usage of specific models for new research contexts. This study contributes to the long-term usage of information systems and continuance literature. However, if information systems evolve, users will start considering new technology features.

System quality is not supported in any relationship. This result contradicts those of Budiardjo et al. (2017), Cidral et al. (2018), and Gao et al. (2015), suggesting that the construct is not important in that context, meaning that m-payment providers are not concerned with system quality. This calls for future research in the same context with different technologies to confirm the assumptions. This study demonstrates that information quality and service quality are important predictors of use and confirmation, and consequently, use and confirmation are important predictors of satisfaction, individual performance, and perceived usefulness. Satisfaction, use, and individual performance are important predictors of continuance intention to use m-payment. As another theoretical implication, the model validates IS continuance intention theory for the case of m-payment use in Mozambique, unlike previous studies that focused on developed economies (Chen and Li, 2017; Fan et al., 2018; Khalilzadeh et al., 2017; Zhou, 2014).

3.6.2. Practical implications

The m-payment service designer and providers are informed with our findings to better understand the most important determinants to ensure long-term usage of m-payment and implement new strategies to improve these determinants. For example, information quality and service quality were found to be predictors that influence use and confirmation, thus suggesting that m-payment providers should provide service and information with good quality to make the service easy and intuitive to use and ensure better experiences using it. In other words, m-payment service should not require much effort from the users, and the content should be understandable, interesting, useful, and reliable. The m-payment providers should ensure that the information available is correct, up-to-date, and useful to the user. In addition, m-payment providers should help the users whenever they need help, and thus the quality of the service is very important (Gao et al., 2015). This study also finds that use and confirmation have a significant

impact on perceived usefulness, satisfaction, and individual performance. Therefore, when the m-payment service provided is better than expected, users will start to perceive usefulness and individual performance, and consequently become satisfied with the service. The m-payment providers should ensure that users have a good experience with m-payment, providing good quality services to exceed users' expectations. Service providers should offer suitable solutions, considering the context or environment of the users. The benefits associated with services should be clear in order to positively impact users' sense of satisfaction and their willingness to continue using the service. Satisfaction and individual performance have a significant impact on continuance intention to use m-payment. This suggests that m-payment providers should ensure that users perceive the benefits of using m-payment, to influence users' sense of satisfaction and long-term usage of m-payment, and should seek to create loyalty from their users, to ensure continuance intention to use m-payment.

Satisfaction is important for using m-payment, and thus m-payment providers should ensure that m-payment works well, that the promised services are available, that the users can use m-payment easily, and that it is useful for their daily lives. System quality was not significant for any of the proposed relationships (use, satisfaction, and confirmation), indicating that in the post-adoption phase the quality of the system is not important. This result may be important for the m-payment providers because it may indicate that the users assume that m-payment works well, that it has already reached maturity, and thus the providers may be concerned about improving other factors such as quality of service or information. However, m-payment providers should continue to ensure good system quality in order to sustain users' intentions to continue using m-payment. This suggests that the m-payment providers should constantly improve the system in aspects related to safety, ease of use, and information, to provide a well-structured system that is easy to navigate and has understandable information. Service quality was not relevant for satisfaction to use m-payment. It may be that the user support service is not effective, perhaps hindering access to user support service. Thus, m-payment providers should improve the quality of service, such as user support with different types of support platforms, empowering the staff who will support the users to have the necessary knowledge to help the users with all of their needs, and create

support manuals in physical and digital format, guaranteeing support to the users physically and online.

3.6.3. Limitations and future research

The research has some limitations. The participants of the sample were highly educated and relatively young (adults). Future research could include non-students and broaden the age range of participants. Considering that m-payments process financial transactions, future research can extend the model by combining new factors such as trust and perceived risk in order to add more insights to the research. Our model was proposed for and validated in Mozambique and may not fully represent all potential m-payments users, which might be a threat to our findings. To enhance generalization and external validity, the sample for future research could include other African countries with different cultures and access to resources.

3.7. Conclusion

The current research approaches the theme of m-payment in an Africa context, testing the empirical case of a modern and important technology in Mozambique. In the IS literature the concept of continuance intention has not been deeply explored regarding this context. To fill this gap, a theoretical innovative framework was proposed by joining the D&M IS success model and the ECM, to understand continuance intention to use m-payment. The empirical results show that continuance intention is positively influenced by individual performance, use, and satisfaction. Information and service quality positively impact the use and confirmation of the expectations. Information quality, use, and confirmation of expectations positively impact user satisfaction. M-payment providers should focus primarily on the quality of information, ensure that information is secure and up to date, and ensure that m-payment services are working properly, to affect m-payment usage and user satisfaction. The use of m-payment, satisfaction, and perceived individual performance are the most important factors to explain the continuance intention to use m-payment.

Chapter 4 – Continuance intention of mobile payment: TTF model with trust in an African context: case study of Mozambique

4.1. Introduction

How do trust and the alignment of task and technology characteristics affect the continuance use of mobile payment (m-payment)? M-payment has become one of the prominent services in use today (Gao & Waechter, 2015; T. Zhou, 2014b), by which users can make payments for goods, services, and bills; check balances; and transfer money anytime and anywhere (Kujala et al., 2017; Liébana-cabanillas et al., 2018; J. Lu, Wei, et al., 2017; Oliveira et al., 2016; T. Zhou, 2014b). M-payment is defined as any payment in which a mobile device (mobile phone or tablet) is used to perform financial value exchanges (initiate, authorize, and confirm) in return for goods and services (Shao et al., 2019). There are different ways to conduct a transaction using m-payment. The simplest way is short-message-based, by which using a simple mobile phone the user can check balances or conduct payment using short text messages (Singh et al., 2020; T. Zhou, 2013). The m-payment service is growing exponentially all over the world and is bringing benefits to users and the providers (Humbani & Wiese, 2018). Considering its benefits, companies are providing it in different ways around the globe (Fan et al., 2018a; Singh et al., 2020).

The technological sector in the African context is still under development, which represents a challenge for the entire economy. Financial services like banks are not available in the same proportions in all regions of a country, e.g. Mozambique (Humbani & Wiese, 2018; INE, 2019), so people living in rural areas are forced to travel farther to gain access to banks (Batista & Vicente, 2014; Humbani & Wiese, 2019). Due to the lack of access to technology in the same proportion; a service that can be used by the population, regardless of their literary and economic level, reducing the need to use banks, is of great importance (Pal et al., 2020). For m-payment, the technological factors in the African context facilitate its accessibility (e.g., only need telephone network) (Jack & Suri, 2011), thereby bringing the service to many people.

Much research has been directed to the subject of m-payment (J. Lu, Wei, et al., 2017; Oliveira et al., 2016; Sinha et al., 2019). Previous literature reports the use of different theoretical models to investigate continuance intention to use m-payment. Zhou, (2013a) used information system success and flow theory to examine continuance intention of m-payment services. Shao et al., (2019) used trust and innovation diffusion theory to understand m-payment platforms. Lu et al., (2017) used expectation-confirmation theory, mobility, privacy protection, social influence, and cultural values to understand m-payment continuation. Chen & Li, (2017) used IT continuance, risk-trust, and affect-cognition literature to understand continuance intention of m-payment services. To the best of our knowledge, there are no published studies that examine the intention to continue using m-payment in Mozambique. To fill the gap, we investigate the factors that may influence the continued use of m-payment in that country. Considering that after the change from traditional payment method (cash) to m-payment, users may have uncertainty and mistrust when using m-payment. Knowing that the transactions involve cash, as well as the importance of functionalities and technological factors that may better help the use of m-payment, we analyse the task-technology fit (TTF) (Goodhue and Thompson, 1995) and overall trust (Oliveira et al., 2017) theories and evaluate their relationships for continuance intention. Furthermore, no previous study has joined the TTF, overall trust, and ECM constructs into a single model, as we do in the present study (Davison and Martinsons, 2016). The TTF model states that IT can have a positive impact on an individual's task performance if the IT functionalities match the requirements of the tasks that the user needs to perform (Goodhue and Thompson, 1995). Regarding the TTF, the model was used in different technological contexts such as: mobile banking (Tam and Oliveira, 2016), MOOCs (Wu and Chen, 2017), social media search system (Dang et al., 2020), and internet banking (Rahi et al., 2020), and has been combined with different theoretical models such as: technology continuance theory (Rahi et al., 2020), technology acceptance model (TAM) (Wu and Chen, 2017), DeLone and McLean information systems success model (D&M ISSM) (Tam and Oliveira, 2016), mental workload and unified theory of acceptance and use of technology (UTAUT) (Dang et al., 2020). Overall trust refers to the combination of factors such as competence, integrity, and benevolence in order to understand the user's confidence to use IT (Oliveira et al., 2017). Many studies have

used overall trust in combinations with different models and in different contexts. Oliveira et al. (2017) used overall trust with consumer characteristics, firms' characteristics, website infrastructure, and interactions to examine purchase intention in e-commerce. Tam et al. (2019) used overall trust with D&M ISSM to examine individual performance in e-commerce. Considering that cyber security is today considered a fundamental challenge to any country or organization, and especially in mobile payments contexts, it is important to have a sense of security and trust. Considering that fact, we expect that there is a positive link between overall trust and use and continuance intention. In addition to trust, the asymmetry of information and communication technology (ICT) across African countries is another challenge. The constraints of that asymmetry could affect the long-term of viability of mobile payment, and for that reason it would be valuable to understand how the task-technology-fit of mobile payment may explain the use and individual performance in Mozambique.

The contribution of this study is twofold. First, it contributes to the literature on continuance intention, since many studies have been carried out in the context of technology adoption (Khalilzadeh et al., 2017; Verkijika, 2020). However, studying continuance intention has an impact on the long-term survival of technology (A Bhattacherjee, 2001). For this reason, this study aims to expand the knowledge on this topic by joining the two theories mentioned above: task-technology characteristics and expectation-confirmation model. Second, this study was based on the ECM model (A Bhattacherjee, 2001), which has been tested in different contexts such as m-payment platforms (Shao et al., 2019), MOOCs (Gao et al., 2015) and mobile apps (Tam et al., 2020). However, information systems (IS) have different characteristics and functionalities (Nascimento et al., 2018). In this sense, we seek to extend the model to understand the impact of technological aspects (TTF) and trust in continuance intention to use m-payment. In addition, we intend to understand the impact of satisfaction as a moderator. To the best of our knowledge, this study is the first to combine the TTF, ECM, and the trust dimension to investigate continuance intention.

The plan of the paper is as follows. We begin with a literature review of the relevant studies regarding m-payment, TTF, and the dimension of trust. Second, we present the

research model, followed by the hypotheses. Third, we present the methodologies used to test the hypotheses. We then show the results, followed by a discussion and implications of this study, and suggestions for future research.

4.2. Literature review

4.2.1. Mobile Payment in an African context

In Africa m-payment has over 29 million active users in more than five countries (Jack and Suri, 2011; Vodafone Group, 2016). In some countries it is called mobile money (Koloseni and Mandari, 2017). M-payment refers to services that enable users to transfer money, pay services and goods, and withdraw money via a mobile phone (Koloseni and Mandari, 2017; Shao et al., 2019). It is sometimes confused with online payment, but it is not the same because online payment uses any mobile device connected to the internet, such as a tablet, mobile phone, or laptop (T. Zhou, 2015), while m-payment uses only mobile phones with or without internet. In Mozambique 26.4% of the population uses a mobile phone and 11.7% uses m-payment (INE, 2019). This exponential growth is occurring because this service is becoming an alternative solution for rural and urban people to access financial services (Humbani and Wiese, 2019). As most bank branches are distant from people, they naturally wish to avoid travelling long distances to access the bank's services. M-payment thus offers substantial benefits by having an appropriate account and being able to use it anytime and anywhere (Jack and Suri, 2011). Earlier studies have pointed out that m-payment originated in developing countries via SMSs and that it spread quickly due to limited cash alternatives, such as bank accounts and credit cards, thereby helping communities that were otherwise excluded from the financial system (Humbani and Wiese, 2019; Makina, 2017). The value of conducting studies in the African context is therefore evident (Humbani and Wiese, 2019).

Once a new technology such as m-payment is developed and released to the society, it is important to understand the acceptance factors (Venkatesh et al., 2003). When the technology has been in use for some time, it is important to investigate the factors that influence the continuity of use from the users' point of view (A Bhattacherjee, 2001).

Regarding m-payment, considering the impact of mistrust or uncertainty, the functionalities, and the technological drivers for m-payment use, it is of great importance and necessity to examine the users' continued use intention and perceptions toward m-payment. Furthermore, it is essential to offer effective m-payment functionalities that can better handle user transactions (T. Zhou, 2014b). Therefore, we decided to use TTF and overall trust as our base theories and examine their impact on the continuance intention.

Earlier studies on continuance intention to use m-payment have been published (X. Chen and Li, 2017; Lu et al., 2017; Park et al., 2017; Yu et al., 2018). Considering that our aim is to understand the intention to continue using m-payment, we reviewed previous studies to understand what has already been done in the context of m-payment. Zhou (2014) investigated the continued use of m-payment based on trust, flow, system quality, and information quality. Chen and Li (2017) investigated the intention to continue to use m-payment services using IT continuance, risk-trust, and affect-cognition. Koloseni and Mandari (2017) used the theory of planned behaviour, perceived cost, perceived trust, and satisfaction to examine continuance usage of mobile money services. Yu et al. (2018) investigated the intention to continue using m-payment based on trust transfer theory. Humbani and Wiese (2019) used the technology readiness index to predict adoption and continuance intention, with the goal of exploring the readiness of the m-payment app technology. Shao et al. (2019) investigated antecedents of trust and continuance intention in m-payment platforms based on trust and innovation diffusion theory. Raman and Aashish (2021) investigated the antecedents of users' willingness to continue using m-payment services, based on trust, convenience, social value, satisfaction, service quality, attitude, risk, and effort expectancy. Odoom and Kosiba (2020) used UTAUT to investigate continuance intention of m-money. Liébana-Cabanillas et al. (2021) investigated the determinants of intention to continue using and the moderating effect of gender and age of NFC m-payment users. They applied constructs from different models such as theory of reasoned action, perceived value theory, UTAUT2, personal innovation in information technology, mobile payment technology acceptance model, and ECM. With our analysis of the literature, we found that there are different models applied to study m-payment. Regarding the ICT asymmetry across African countries and general

perception of trust to give transparency and security to mobile payment, we joined TTF and overall trust to the ECM.

4.2.2. Information system continuance model

"IS continuance" was presented by Bhattacherjee (2001) to explain the intention to continue using IS. The ECM model focuses on three cognitive feelings (expectation of confirmation, perceived usefulness, and satisfaction). The model proposes that satisfaction is the strongest influencer of continuance intention, on the grounds that it results from the confirmation of expectations and the perception of performance. This means that after the user adopts the IS, and uses it for a while, (s)he will realize if the expectations have been confirmed and if the IS is/are useful. If the result is positive, the level of satisfaction increases and, consequently, the intention to continue using the IS increases (A Bhattacherjee, 2001). The model has been used in previous studies, has been integrated with other models, and has been applied in different contexts (Franque et al., 2020). Wu & Chen (2017) integrated TAM, TTF, MOOCs features and social motivation to understand continuance intention to use MOOCs. Gao et al. (2015) joined the information success model, flow theory, and trust to investigate mobile purchase. Humbani & Wiese (2019) integrated the technology readiness index to explore the use of mobile apps. In the present study we combine TTF and overall trust in order to understand m-payment. The model will help us to assess the effect of TTF and overall trust factors on continuance intention.

4.2.3. Task technology fit (TTF) model

The TTF model introduced by Goodhue & Thompson (1995) is applied in IS research to explain the performance impact of IS. The theory argues that the ability of an IS to perform an activity task characteristic easily and well, and the technology characteristics that support such activities, significantly influence the use and performance impact of an IS. When the task and technology fit together, the users' activities are facilitated, improving the use of the technology, and thereby improving the perception of performance impact (Goodhue & Thompson, 1995). The better alignment of the task and technology characteristics makes it possible to encourage the

use and performance impact of m-payment. Several research papers apply the TTF model combined with other theories. Oliveira et al. (2014) combined TTF, UTAUT, and initial trust model (ITM) to investigate mobile banking adoption. The authors used TTF to predict the performance expectancy and adoption in the UTAUT model. Tam & Oliveira (2016b) combined TTF and the IS Success model to understand the influence of mobile banking on individual performance. They used TTF to predict usage and individual performance (performance impact) constructs and as a moderator of the relationship between user satisfaction and individual performance. Dang et al. (2018) combined mental workload (MWL), TTF, and UTAUT to examine the impacts of mental workload and TTF on acceptance of the social media search system. They used TTF to predict the performance expectancy, effort expectancy, and facilitating conditions of the original UTAUT model. Wu & Chen (2017) combined TTF and TAM to understand continuance intention to use MOOCs, using TTF to predict the constructs' perceived usefulness and perceived ease of use of the TAM model. Larsen et al. (2009) combined TTF and post-acceptance model (PAM) to understand users' motivation to continue the use of IS. They used TTF to predict the constructs' perceived usefulness and utilization in the PAN model. Afshan & Sharif (2016) combined TTF, UTAUT, and ITM to investigate mobile banking acceptance in Pakistan. They used TTF to predict the behavioural intention construct of the UTAUT model. We thus find that most studies that used TTF had behavioural intention and adoption as the outcome. In this sense, the integration of TTF with ECM will provide some insight into m-payment research.

4.2.4. Trust

Trust has been conceptualized in several ways according to the context in which it is applied (Gefen, Karahanna, & Straub, 2003; Oliveira, Alhinho, Rita, & Dhillon, 2017). According to early literature, in a general view trust reflects the ability of IS to fulfil the tasks correctly, i.e., the IS provider keeps their promise and does not deceive users, and the benefits of the IS need to be perceived by the users and the providers (Zhou, 2014). In m-payment, trust reflects users' beliefs in the reliability of the transactions made through m-payment. If an m-payment provider ensures secure transactions, fulfils the tasks correctly, and does not deceive the users, it will be possible to improve the

perception of reliability amongst the m-payment users (Chen & Li, 2017; Zhou, 2014). There are several research articles that combine trust with other theoretical models in IS research, such as Zhou & Li (2014) who investigate mobile social network services; Zhou (2013) to understand m-payment continuance intention; Gao et al. (2015) to perceive consumers' mobile purchase continuance intention.

In our research we use the overall trust and trust dimension. Benevolence, competence, and integrity comprise the dimension of trust (Oliveira et al., 2017). Competence reflects the ability of an IS provider to enforce their promises to users. Integrity reflects the IS provider's capacity to act consistently, reliably, and honestly while keeping its promises. Benevolence reflects on the probability of an IS provider to maintain users' interests and to show sincere concern with the well-being of the users (Chen & Dhillon, 2003; Oliveira et al., 2017; Palvia, 2009);

4.3. Research model

The purpose of our study is to understand the continuance intention, which we use as the basis of the ECM model (A Bhattacherjee, 2001). Considering ECM an axiomatic theory, which is acceptable and truly self-evident (J. K. Lee et al., 2021), in the current study we adopted for our model two constructs, satisfaction and continuance intention (A Bhattacherjee, 2001), considering that the dependent construct of our study is continuance intention. Following the parsimony approach and reducing model complexity to make it easier to grasp, the constructs perceived usefulness and confirmation were not added. The addition of other models and variables offers a better understanding of continuance intention to use m-payment. We therefore join the TTF model, which directly influences use and individual performance, with trust, which is a direct determinant of use and continuance intention. The theoretical model (Fig. 4.1) is designed to examine the continuance intention to use m-payment in the African context. The model asserts that:

1. TTF determines the use of m-payment and the perceived individual performance:

2. the use of m-payment can have an indirect or direct influence on continuance intention, and a direct influence on individual performance;
3. individual performance determines the continuance intention directly;
4. the trust dimension can have an indirect or direct influence on continuance intention, and a direct influence on the use;
5. user satisfaction may moderate the impact of individual performance, use, and the trust dimension on m-payment continuance intention.

The following section presents the proposed hypotheses.

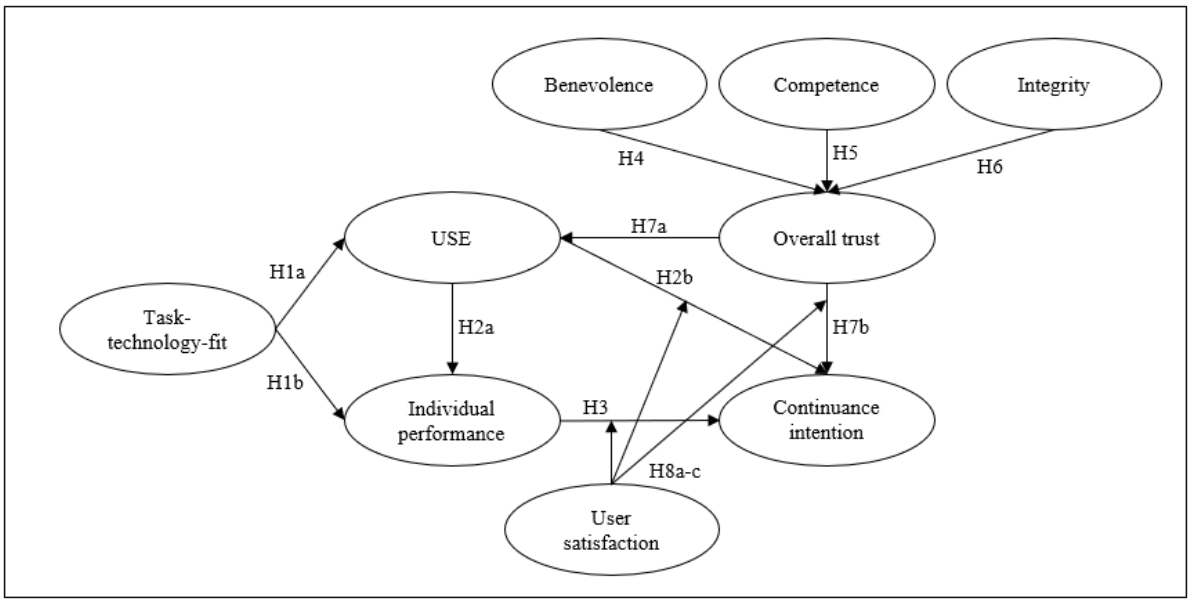

Figure 4.1 - Proposed research model.

From a technical perspective, tasks are the activities carried out by users when they are using m-payment. However,, if the task characteristics of the m-payment are easy to use, appropriate and understandable (Wu & Chen, 2017), the users will be comfortable with their use and continue using it, on the other hand, users facing difficulties in using m-payment will prefer opting traditional payment method rather than m-payment (Rahi et al., 2020). Task characteristics are relevant constructs to influence positively TTF (Rahi et al., 2020; Tam & Oliveira, 2019).

Technology characteristics are physical and logical tools (hardware and software), i.e., the look, feel, and speed of technology. An effective technology makes m-payment more attractive and useful for the users (Rahi et al., 2020). This factor can affect the long-term usage of the technology (Tam & Oliveira, 2016b, 2019). For m-payment, the technology characteristics play an important role, as users are carrying out monetary transactions, the speed of the operation and the response time are important factors. With the minimum technology characteristics, the users need to understand the actual working of tasks of m-payment (Tam & Oliveira, 2019; B. Wu & Chen, 2017).

The TTF is the fit between task and technology characteristics (Goodhue & Thompson, 1995; Wu & Chen, 2017). This attribute means that when m-payment users perceive a match between task and technology (understand that the features and technological characteristics are suitable for carrying out transactions) it will be possible to improve the usage and the continued usage of m-payment (Tam & Oliveira, 2016b). Therefore, it is expected that the m-payment users will performs the tasks efficiently (Rahi et al., 2020). when the m-payment tasks are easy to use, fast, and provided anytime and anywhere, users will feel the usefulness of m-payment, thereby increasing the work performance of the individual. Thus, we hypothesise:
H1a: TTF positively influences use.
H1b: TTF positively influences individual performance.

When users start to use any system, they start to perceive benefits. When using m-payment, users will perceive its benefits and the level of perceived individual performance will increase. Earlier studies report empirical support for the relationship between use and individual performance (Tam & Oliveira, 2016a, 2016b). Thus, the frequent use of m-payment to check balances, make transfers, pay for goods, etc. will influence the individual performance, and increase the intention to continue using m-payment. When users perceive effortless use, and when they start perceiving performance outcomes (Chang, Liu, & Chen, 2014), usage will become more frequent. When the use of m-payment services starts to become automatic and users use it more often, we expect that the continuance usage of m-payment will increase (Tam & Oliveira, 2016b). Thus, we hypothesize:

H2a: Use positively influences users' individual performance.

H2b: Use positively influences continuance intention.

Individual performance is the perception on the part of an individual that m-payment enables the accomplishment of tasks more easily and quickly. It suggests that individuals use m-payment if they perceive that it would be useful and save time to conduct activities (DeLone & Mclean, 2003; Tam & Oliveira, 2016b). Tam & Oliveira (2016a) observed that TTF and use affect individual performance. Dang et al. (2018) and Oliveira et al. (2014) revealed that TFF affects performance expectancy. When the user perceives the performance of the IS they understand the benefits of m-payment. In this way the individual performance can influence the intention to continue using m-payment. Nevertheless, for the task and technology characteristics, the user can access m-payment anytime and anywhere. In this sense, by improving the perception of individual performance it will be possible to improve continuance intention to use m-payment. Thus, we hypothesize:

H3: Individual performance positively influences continuance intention.

With the evolution of IS, trust began to be important (Koksal, 2016). Some researchers divide trust into three parts: competence, integrity, and benevolence (Oliveira et al., 2017). Competence reflects the ability of an m-payment provider to enforce their promises to users. Integrity reflects the m-payment provider's willingness to act reliably and honestly while keeping its promises. Benevolence reflects the ability of an m-payment provider to ensure the welfare of their m-payment users. In this sense, when the m-payment provider handles the user's transactions, is honest, keeps its commitments, and acts in the best interest of the users, overall trust is positively influenced (Chen & Dhillon, 2003; Oliveira et al., 2017). Thus, we hypothesize:

H4: Benevolence positively influences users' overall trust.

H5: Competence positively influences users' overall trust.

H6: Integrity positively influences users' overall trust.

Trust is a concept that has long been studied in a variety of disciplines (Oliveira et al., 2017; Palvia, 2009). In IS, trust is the attitude of users to try to avoid risky situations when using IS (Palvia, 2009). Talwar et al. (2020) found that initial trust affects

perceived usefulness and confirmation. Shao et al. (2019) confirmed that trust affects continuance intention. In this sense, when the user believes in the IS or has some level of confidence, (s)he will intend to use it (Oliveira, Faria, et al., 2014). Trust is an important factor in ensuring the use and continuance intention to use m-payment. Therefore, for m-payment to succeed, the provider must ensure a low-risk situation in order to improve the users' trust (Zhou, 2014). When the users have a high level of trust in m-payment and the provider, it will improve the continuance intention to use m-payment (Oliveira et al., 2017). Thus, we hypothesize:

H7a: Overall trust positively influences use.

H7b: Overall trust positively influences users' continuance intention.

Satisfaction reflects the feeling of an individual when using m-payment services (A Bhattacherjee, 2001). When the usage experiences and performance outcomes are positively confirmed, it will be possible to improve the users' satisfaction of a service or IS (A. Bhattacherjee & Lin, 2014). To ensure the continued use of the m-payment, one must first use it, so using it is an important factor (T. Zhou, 2014b). In the use of m-payment trust plays an important role, and trust is therefore another important factor for use (Shao et al., 2019). Additionally, when we use the m-payment its advantages and benefits are recognized. Thus, we believe that the level of satisfaction that the user has can moderate the impact of the use, trust, and individual performance in the continuance intention to use m-payment. When users are pleased with the m-payment, the long-term relationships become stronger (Yu et al., 2018). In our study we are proposing that satisfaction can positively moderate the main relationships of continuance intention, namely: individual performance, use, and overall trust on continuance intention (Carillo et al., 2017; Cho, 2016; Mouakket, 2015; Yu et al., 2018). Thus, we hypothesize:

H8a: User satisfaction positively moderates the impact of individual performance on continuance intention.

H8b: User satisfaction positively moderates the impact of use on continuance intention.

H8c: User satisfaction positively moderates overall trust on continuance intention.

Considering our proposed model, we expect that use and individual performance can be considered as mediators. The consequence of overall trust on continuance intention can be direct or through use. In addition, the consequence of use on continuance intention can be direct or through individual performance. Thus, we hypothesize:

H9a: Use positively mediates the relationship between overall trust and continuance intention.

H9b: Individual performance mediates the relationship between use and continuance intention.

4.4. Methods

4.4.1. Measurement

We applied an online survey to collect data (Alraimi, Zo, & Ciganek, 2015; Chang & Zhu, 2012; Chen, Yen, & Hwang, 2012; Tam & Oliveira, 2016). We built a questionnaire with constructs and items drawn from the literature (see Appendix A). The measurement items for benevolence, competence, integrity, and overall trust are adopted from Oliveira et al. (2017); the TTF, use, and individual performance from Tam & Oliveira (2016); satisfaction and continuance intention from Bhattacherjee & Lin (2014).

4.4.2. Data

We used a seven-point scale to measure the items, ranging from 1 (totally disagree) to 7 (totally agree). The survey was created and administered in English and revised for content validity by a language professional. A professional translator translated the questionnaire into the Portuguese language because the survey was administered in Mozambique. The questionnaire was then translated back into English to ensure that the meanings were correct (Brislin, 1970). To validate the instruments, we conducted a pilot test on a group of 30 students, who were excluded from the main sample. Overall, 384 valid responses were received. We applied the Kolmogorov-Smirnov test (K-S) to examine the distribution of the two groups of respondents, and found no statistically significant differences between the first and second groups. (Ryans, 1974). Harman's test (Podsakoff et al., 2003) was used to check for common method bias, and confirmed

no significant bias. We collected the data between June 2018 and November 2018. Statistics indicate that 64% of the respondents were professional workers, 59% were men, 39% had used m-payment one (1) to four (4) times during the last 3 months (Table 4.1).

Table 4.1 - Sample characteristics

Age		
< 25	129	34%
25 - 30	122	32%
31 - 40	85	22%
41 - 50	39	10%
> 50	9	2%
Gender		
Female	158	41%
Male	226	59%
Education		
High school or below	91	24%
Bachelor's degree	179	47%
Master's degree or higher	114	30%
Employment		
Students	99	26%
Professional workers	244	64%
Retired	1	0%
Unemployed	40	10%
Marital status		
Single	187	49%
Married	86	22%
Divorced	23	6%
Widowed	10	3%
Marriage in fact (cohabitation)	75	20%
Do not know answers	3	1%
M-payment usage frequency (time / 3 months)		
1 - 4	149	39%
5 - 10	98	26%
> 10	137	36%

4.5. Data analysis and results

PLS-SEM (partial least squares structural equation modelling) with Smart PLS (v. 3.2.8) (Ringle et al., 2015) was used in this research to test and assess the hypotheses of the proposed model. Earlier research has recognized the potential of PLS-SEM for

theory development (Alraimi et al., 2015; Côrte-Real et al., 2020; Tam & Oliveira, 2016b). Additionally, the data are not normally distributed (K-S test) because the research model is complex, and the research model has not been tested in the literature. Thus, PLS-SEM is an appropriate method for this research.

4.5.1. Measurement model

To evaluate the measurement model, we applied (1) the indicator reliability (considering good loading to be greater than 0.70), (2) construct reliability (using composite reliability (CR) indicator), (3) convergent validity (using average variance extracted (AVE)), and (4) discriminant validity. The results are reported in Tables 4.2 and 4.3. All CRs and AVEs are greater than the recommended threshold values of 0.70 and 0.50 respectively (Fornell & Larcker, 1981; Hair, Hult, Ringle, & Sarstedt, 2016; Henseler, Ringle, & Sinkovics, 2009).

Table 4.2 - Measurement model

Construct	AVE	Composite Reliability	Cronbach's Alpha	Item	Loadings	t-value
Task Technology Fit (TTF)	0.595	0.854	0.771	TTF1	0.757	30.595
				TTF2	0.829	33.772
				TTF3	0.801	33.594
				TTF4	0.690	16.863
USE (U)	0.654	0.883	0.823	U1	0.837	40.879
				U2	0.804	31.559
				U3	0.828	33.871
				U4	0.764	22.359
Individual Performance (IP)	0.678	0.863	0.762	IP1	0.845	53.862
				IP2	0.878	65.528
				IP3	0.742	19.317
Benevolence (B)	0.578	0.804	0.634	B1	0.733	15.976
				B2	0.819	33.241
				B3	0.725	13.953
Competence (COMP)	0.617	0.829	0.691	COMP1	0.780	25.168
				COMP2	0.796	28.684
				COMP3	0.781	25.036
Integrity (I)	0.634	0.874	0.806	I1	0.768	27.753
				I2	0.822	35.366
				I3	0.843	50.340
				I4	0.748	21.795
Overall Trust (OT)	0.639	0.876	0.812	OT1	0.813	35.953

				OT2	0.823	36.363
				OT3	0.788	24.712
				OT4	0.773	25.229
Satisfaction (S)	0.721	0.886	0.807	S1	0.868	52.255
				S2	0.860	46.628
				S3	0.818	28.705
Continuance Intention (CI)	0.696	0.873	0.782	CI1	0.837	43.392
				CI2	0.811	26.823
				CI3	0.854	56.534

Table 4.3 - Latent construct correlations and the square root of AVEs.

	Mean	STDEV	TTF	U	IP	B	COMP	I	OT	S	CI
TTF	4.709	1.029	0.771								
U	4.877	1.291	0.458	0.809							
IP	4.679	1.183	0.626	0.504	0.824						
B	4.389	1.091	0.433	0.405	0.429	0.760					
COMP	4.501	1.144	0.479	0.545	0.435	0.456	0.786				
I	4.618	1.151	0.554	0.488	0.462	0.550	0.630	0.796			
OT	4.526	1.154	0.369	0.441	0.435	0.582	0.554	0.586	0.800		
S	4.612	1.251	0.452	0.624	0.428	0.483	0.615	0.522	0.518	0.849	
CI	4.679	1.204	0.552	0.576	0.579	0.444	0.518	0.471	0.438	0.473	0.834

All constructs fulfil the criteria (see Table 4.2), ensuring convergence. The Fornell-Larcker test was used to assess discriminant validity. For this the square root of AVE of each construct should be greater than the correlation between constructs (Fornell & Larcker, 1981) (see Table 4.3). Moreover, we examined the cross-loadings criteria (Appendix B), and heterotrait-monotrait ratio of correlations (HTMT) (Appendix C). Each item presents higher loading on its corresponding factor than the cross-loading, ensuring discriminant validity (Chinn, 1998; Götz et al., 2010). Based on HTMT (Appendix C), we can see that all the values are below 0.90, and conclude for discriminant validity (Henseler et al., 2015). The results indicate that the constructs are statistically distinct, and thus, we can assess the structural model. This means that the measurement model results indicate good indicator reliability, construct reliability, convergence validity, and discriminant validity.

4.5.2. Structural model

The results of the structural model were examined by the path coefficients that present the strength of the constructs' relationships, variance inflation factor (VIF), t-statistic value, and variance explained (R^2) to validate the hypotheses and constructs (see Fig. 4.2). The structural model examination used 5000 bootstrap resamples to estimate the paths' significance (Henseler et al., 2009). We tested the VIF to assess the multicollinearity and all the constructs are below the threshold of 5, thus indicating the absence of multicollinearity (Hair et al., 2016).

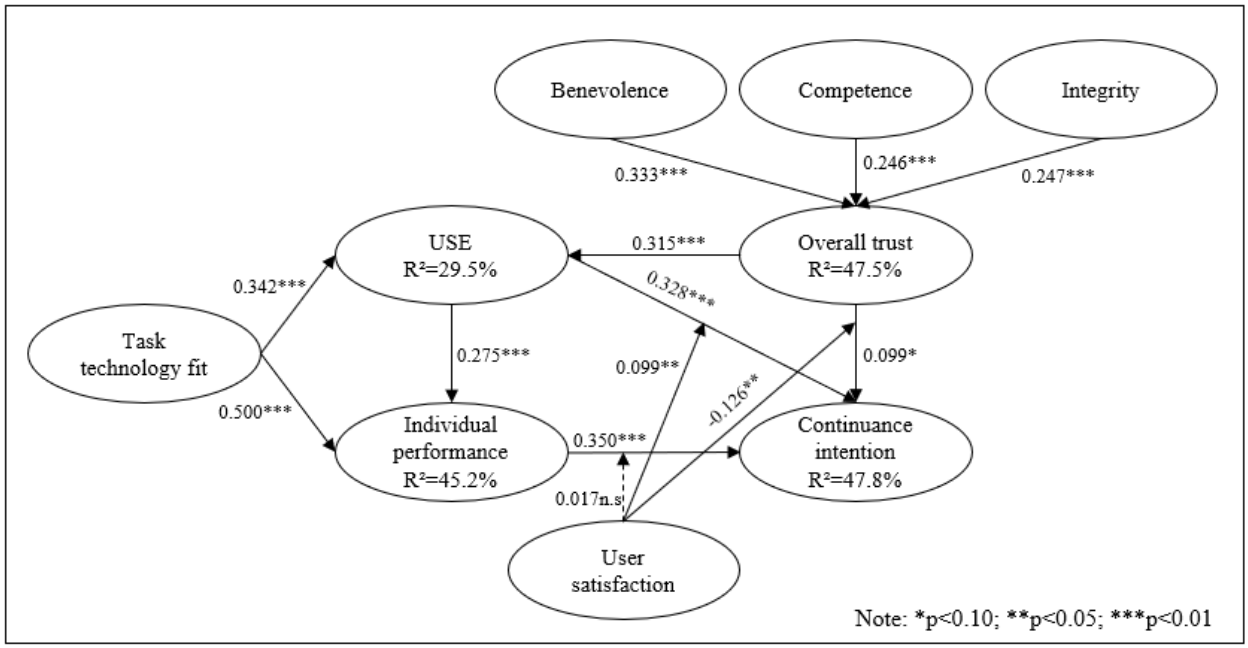

Figure 4.2 - Research model

Regarding R^2 (see detail in Fig. 4.2), the results of the PLS structural model explain 29.5% of the variation in use. The task technology fit, and overall trust are significant in explaining use. Thus, confirming H1a and H7a. The research model explains 45.2% of the variation in individual performance and are explained by task technology fit and use, confirming H1b and H2a. The research model explains 47.5% of overall trust variation and are explained by benevolence, competence, and integrity, confirming H4, H5, and H6. The research model explains 47.8% of the continuance intention, explained by use, individual performance, and overall trust, confirming H2b, H3, and H7b. Additionally, three moderating effects (H8a, H8b, and H8c) were examined. The

findings showed that H8b and H8c were significant, and H8a was not statistically significant. However, the moderation effect of H8c is negative, meaning that greater user satisfaction will be weaker in the relationship between overall trust to continuance intention, thus confirming H8b and H8c.

4.5.3. Mediating role of use and individual performance

The findings reveal that there are mediation effects on some constructs. Mediation effect (indirect effect) is presented by a third intervening variable between an independent and a dependent construct (Hair Jr. et al., 2016). We performed a mediation analysis and the results (Table 4.4) show that individual performance is a partial mediator between use and continuance intention. Also, use is a partial mediator between overall trust and continuance intention.

Table 4.4 - Mediation analysis.

	Beta	t-Test	p-Value	conclusion
H9a: OT → U → CI	0.103	3.922	0.000	Partial mediation
H9b: U → IP → CI	0.096	3.635	0.000	Partial mediation

Notes: Use (U); individual performance (IP); overall trust (OT), and continuance intention (CI).

4.6. Discussion

We developed and validated a conceptual model that explains the importance of the TTF model and overall trust toward continuance intention to use m-payment. The findings show that 13 of the 15 hypotheses were confirmed. Overall trust can influence use and continuance intention to use m-payment. Overall trust is supported by benevolence, competence, and integrity. This means that m-payment service providers should ensure the best interests of their end-users, service support should do its best to assist users, and end-users should feel supported and confident with the services. Additionally, the service provider must be honest with users, keeping its commitments with the end-users. When the m-payment service provider has enough expertise to support users, they will start trusting the provider and the technology, thereby motivating users to use m-payment, and boosting their intention to continue using m-payment (Oliveira et al., 2017; Yu et al., 2018; T. Zhou, 2011b). By improving users'

overall trust, it will be possible to improve use and the intention to continue using m-payment (Zhou, 2013, 2014). TTF positively impacts use and individual performance. The task and technology characteristics are fundamental to the use of m-payment, considering that users have different experiences. Users must realize that the features are objective, easy to use, with perceptible information, and that the characteristics of the technology are adequate to use the functionalities. For example, in Mozambique, service providers should ensure a greater fit of task and technology characteristics to enhance the usage of m-payment by users (Tam & Oliveira, 2016b).

Considering the limitations of banking infrastructure, in terms of space and time, m-payment is a useful alternative, as it provides real-time services anytime and anywhere and is an attractive alternative for people who live far from banks (Yu et al., 2018). By improving the task and technology characteristics, it will be possible to improve the use and perceived individual performance of end-users, and consequently, improve the intention to continue using m-payment. Use positively affects individual performance and continuance intention to use m-payment. However, when the users sense trustworthiness and m-payment providers deliver adequate services with good characteristics to end-users, they will feel satisfied and motivated to use m-payment, consequently perceiving the performance of m-payment and being satisfied to continue using it (Fan, Shao, Li, & Huang, 2018; Liébana-Cabanillas et al., 2018). Individual performance positively influences continuance intention to use m-payment. When end-users understand that m-payment is useful for their daily financial activities, helps to accomplish their tasks easily, and enables them to do tasks more quickly, users perceive individual performance, and continue using m-payment. The m-payment provider should ensure good m-payment characteristics that are easy to use, easy to interpret, fast, and available anywhere and anytime. Doing so will allow the users to perceive the benefits, guaranteeing perceived individual performance (Larsen et al., 2009; Tam & Oliveira, 2016b). By improving individual performance, it will be possible to improve the intention to continue using m-payment.

Table 4.5 - Results of the hypotheses.

Hypotheses	Independent construct	→	Dependent construct	Findings (β)	P-value	Support
H1a	Task technology fit	→	Individual performance	0.500	0.000	Yes
H1b	Task technology fit	→	Use	0.342	0.000	Yes

H2a	Use	→	Individual performance	0.275	0.000	Yes
H2b	Use	→	Continuance intention	0.328	0.000	Yes
H3	Individual performance	→	Continuance intention	0.350	0.000	Yes
H4	Benevolence	→	Overall trust	0.333	0.000	Yes
H5	Competence	→	Overall trust	0.246	0.000	Yes
H6	Integrity	→	Overall trust	0.247	0.000	Yes
H7a	Overall trust	→	Use	0.315	0.000	Yes
H7b	Overall trust	→	Continuance intention	0.099	0.071	Yes
H8a	Individual performance * Satisfaction	→	Continuance intention	0.017	0.778	No
H8b	Use * Satisfaction	→	Continuance intention	0.099	0.033	Yes
H8c	Overall trust * Satisfaction	→	Continuance intention	-0.126	0.025	No

Additionally, satisfaction moderates the relationships among use and overall trust of m-payment to explain continuance intention (Susanto et al., 2016; Yu et al., 2018). When the use of m-payment is moderated by the existence of satisfaction, it is observed that the impact will be high to explain continuance intention to use m-payment. In contrast, the moderating effect of satisfaction on overall trust to explain continuance intention will be weaker. In this sense, if m-payment users have a high level of satisfaction, use will gain strength, and overall trust will lose strength in explaining m-payment continuance intention. The findings also reveal that individual performance is a partial mediator between use and continuance intention, and use is a partial mediator between overall trust and continuance intention. When users have confidence of m-payment, in the services, and value the reliability properties, they increase their intention to continue using m-payment. With use mediation and frequent use of m-payment, trust improves, and consequently intention to continue using m-payment increases. This means that when the users use m-payment in their daily lives to buy products or services and transfer or withdraw money, the intention to continue using it increases. During m-payment use, perceived individual performance such as accomplishing tasks quickly, easily, and perceiving the usefulness of m-payment in everyday life, enhances the positive impact of continuance intention to use m-payment. Thus, m-payment providers should ensure fast task completion, ease of use, and provide services that are useful for the user.

We plotted the moderations of satisfaction to better understand its behaviour (Fig. 4.3) (Aiken et al., 1991). Figure 4.3 illustrates that use of m-payment has a more significant

impact on m-payment continuance intention when user satisfaction is higher. Thus, with a higher level of user satisfaction, the use of m-payment will increase the intention to continue using m-payment. Additionally, overall trust has a low significant impact on m-payment continuance intention when user satisfaction is higher. Therefore, the importance of overall trust for m-payment continuance intention is important when user satisfaction is low.

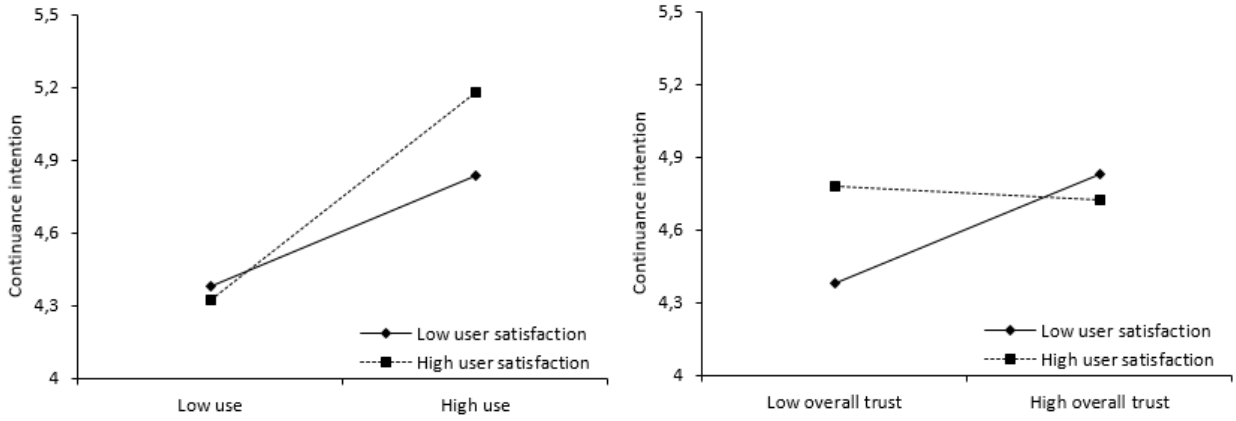

Figure 4.3 - Moderation effect of user satisfaction

4.6.1. Theoretical implications

The current study investigates the continuance intention to use m-payment. Therefore, we integrated TTF, overall trust and ECM. Our results indicate that both TTF and overall trust are important and should be considered when evaluating the continuance intention to use m-payment or similar systems. This means that users' perceptions associated with the level of fit between features and technology, as well as users' confidence in using m-payment may ultimately lead to the intention to continue using m-payment. The study joins the TTF, overall trust, and ECM models to evaluate m-payment, which has not been reported in previous literature. TTF and overall trust were combined to explain continuance intention of the ECM, which is, nevertheless, a well-known model and is one of the most popular and widely accepted models (A Bhattacherjee, 2001). The findings suggest that the integration of TTF and overall trust present predictive power to explain continuance intention. Individual performance, use, and overall trust explain 47.8% of the variation in continuance intention. This result indicates that our model performs well compared to previous studies such as the original ECM (A Bhattacherjee, 2001), which explained R^2=41%, Idemudia et al.

(2018), which explained R^2=46%, Albashrawi and Motiwalla (2019), which explained R^2=45.9%, and Gong et al. (2020), which explained R^2=41.6%. Thus, indicating that TTF and overall trust are important antecedents for m-payment continuance intention.

Second, the model was applied in the African context for m-payment, addressing the concept of continuance intention (Humbani & Wiese, 2019). To the best of our knowledge, very few studies have addressed continuance intention in this context. Therefore, with the proposed model, researchers in the IS field can adapt it to suit other situations in the future. Third, the findings suggest that individual performance and use are the strongest predictors of continuance intention in the context of m-payment. Nevertheless, the results show that the constructs of overall trust and satisfaction must be taken into consideration when addressing continuance intention (A. Bhattacherjee & Lin, 2014; T. Zhou, 2014b). In the Bhattacherjee (2001) model satisfaction is the strongest predictor of continuance intention. In our model satisfaction was explored as a moderator of use, individual performance, and overall trust in continuance intention. The results show that satisfaction moderates the relationship between use and overall trust on continuance intention. Interestingly, the moderation effect in the relationship of overall trust on continuance intention is negative, suggesting that when the level of satisfaction is high, trust is not an important factor influencing continuance intention, showing that user trust is important only when the level of satisfaction is low. The results also suggest that the constructs of individual performance and use are partial mediators of use and continuance intention, and overall trust and continuance intention, respectively. This study demonstrates that the proposed model provides support for the importance of the added constructs, such as the trust dimension to explain continuance intention. The study shows that TTF is an important predictor to use of m-payment and perceived individual performance (Oliveira, Faria, et al., 2014; Tam & Oliveira, 2016b). Use is an important predictor of perceived individual performance and m-payment continuance intention. Overall trust, use, and perceived individual performance are important predictors of continuance intention.

4.6.2. Practical implications

Our study has several practical implications for m-payment decision-makers and providers. Our results suggest that m-payment providers seeking long-term usage should focus on real-time accessibility, real-time services, and services that are quick and secure in order to enhance the task and technology fit of m-payment (Ouyang et al., 2017). This finding is very important to decision- makers and providers because when they provide services with a better fit between task and technology (e.g., providing tasks that are easy to use, enhancing system speed, reducing system downtime, etc.), it will affect the use of m-payment, increase the perceived individual performance, and consequently enhance m-payment continuance intention. In this sense, if m-payment providers want their active customers (users) to continue using m-payment, they should provide adequate services to them.

This study implies that benevolence, competence, and integrity have a significant impact on overall trust (Oliveira et al., 2017; Tam et al., 2019). This, in turn, suggests that m-payment providers should handle m-payment transactions, be truthful to users, act genuinely with users, keep their commitments, and do their best to help users, especially when it involves fraud, or pending transactions. Doing these, it will be possible to increase users' trust in m-payment. Perceived benevolence occurs when the user believes that the m-payment provider acts in their best interest, and if needed the provider will do their best to help. Perceived competence is when the user believes that the m-payment provider has the ability to handle m-payment transactions. Perceived integrity occurs when the user believes that the m-payment provider acts sincerely, is honest, and keeps to their commitments. Therefore, in order to improve the reliability for users, the m-payment provider should be honest and user-oriented to create a good image, because users need to believe that the m-payment provider will always fulfil their promises. This might encourage users to use and continue using m-payment (Oliveira et al., 2017; Palvia, 2009).

However, to enhance the continuance intention to use m-payment, the provider should ensure trustworthiness and provide quick and easy to use tasks that are easy to understand in order to ensure perceived individual performance of users. Considering

the moderating effects of satisfaction, the m-payment provider should ensure a high level of satisfaction to improve the use of m-payment. When the users are satisfied, they will use and also invite others to use m-payment. Based on these findings, it is recommended that the m-payment provider base their action plans on the determinants that influence m-payment users, such as task-technology fit, trust, perceived individual performance, and the use of m-payment.

4.6.3. Limitations and future research

Some limitations exist in our study. The data were collected in Mozambique, and to generalize the applicability of the study, it is suggested that future studies could be conducted in other African countries. The sample represents a highly educated population because we collected the data at universities, but most m-payment users are from the rural areas of Mozambique. Future studies may test our model in a different part of the country and/or in another African country. Considering that gender equality is an interesting and important topic in the African context (Humbani and Wiese, 2018), future research may examine the differences between genders. This study is related to a single type of technology (m-payment); a comparison with another technology (e.g., m-banking) might reveal other insights and enhance generalization. Considering that cultural factors play an important role in an African context, future research might include some cultural factors, such as uncertainty avoidance or individualism.

4.7. Conclusions

The rise of m-payment in Africa has brought many opportunities to people, and banks are changing the way that they provide services to local communities (Batista & Vicente, 2018; Humbani & Wiese, 2018). Our study empirically assesses TTF and the dimension of trust to create the intention to continue using m-payment amongst users. This study contributes to the literature by providing a theoretical model to explain continuance intention to use m-payment. It provides a baseline to decision-makers and providers of how technological factors and trust are important to ensure long-term usage of m-payment. The results demonstrate that the most important factors to explain m-payment continuance intention are individual performance, use, and overall trust.

Individual performance and use play important roles as partial mediators between use – continuance intention and overall trust – continuance intention. Our results show that satisfaction has significant importance as a moderator between use and overall trust on continuance intention.

Chapter 5 – Role of the uncertainty avoidance culture on the expectation confirmation model: mobile payment case

5.1. Introduction

In recent years one of the goals of developing countries has been to reduce the poverty level of their populations (Humbani & Wiese, 2018; Lagna & Ravishankar, 2021). One of the initiatives that governments have employed is to improve the financial inclusion of the population, placing banks closer to them for the purpose of boosting the local commerce, and creating more opportunities for the local population (Humbani & Wiese, 2018). However, building-banking infrastructures closer to the population is still a challenge for governments and financial institutions, and one of the solutions to this challenge has been to make financial services available electronically (e.g., mobile banking, mobile payment). The focus of our study is mobile payment (m-payment), as it is a powerful innovation that can help developing countries accelerate their economic development (Humbani & Wiese, 2018; Lagna & Ravishankar, 2021). M-payment is a technology that facilitates the performance of operations such as paying bills, obtaining services or products, transferring money, and/or saving money, in a simple way, anytime and anywhere (Kujala et al., 2017; Liébana-cabanillas et al., 2018; T. Zhou, 2013, 2014a). M-payment has proven its value and importance to the people, as it eases users' access to financial services, thereby contributing to financial inclusion.

Much research has been carried out to examine the constructs that affect the intention to continue to use m-payment. Most have been based on the expectation confirmation model (ECM) (Gao et al., 2015; Shao et al., 2019; Susanto et al., 2016). Previous research has showed that cultural factors have an important affect in continuance usage of information systems (IS) (Bankole & Bankole, 2017; Hallikainen & Laukkanen, 2018). Bankole and Bankole (2017) argued that the adoption and implementation of ICT innovations necessarily depend on cultural factors. It is therefore imperative to consider the cultural context for IS usage. Hallikainen and Laukkanen (2018) showed that national culture is important in the perception of reliability among the users of online storage systems. Moreover, Salehan et al. (2018) illustrated that technology is

an important enabler of cultural union. Thus, IS influences not only the national culture, but also the interaction between different cultures.

For the use of technology, cultural aspects play an important role (Hofstede, 1984; I. Lee et al., 2007a). A few studies have shown the cultural impact on the use of technology (Baptista & Oliveira, 2015; Leidner & Kayworth, 2006), in fact, culture was important to moderate use and intention to use (Muñoz-Leiva et al., 2018; Tam & Oliveira, 2019). This study will apply the cultural dimension of uncertainty avoidance (UA). The main motivation for choosing UA is the fact that we are dealing with m-payment, which is a technology that performs monetary transactions, and thus uncertainty, insecurity, and distrust can influence the decision to continue using m-payment. According to Leidner and Kayworth (2006), 60% of IS/IT research utilizes Hofstede's cultural dimensions (Hofstede, 1984), and most of them have applied the dimensions of UA and individualism-collectivism. Considering the important impact of culture on the use of IS (I. Lee et al., 2007a; Leidner & Kayworth, 2006), the current research investigates the effects of culture on the m-payment continuance intention. Drawing upon ECM, Our model integrates the cultural dimension UA (Hofstede, 1984), and we empirically test the model using Mozambican data. A mixed-methods approach is also applied to explore the users' understanding of the antecedents of m-payment continuance intention. The quantitative and qualitative research methods provide an overall explanation of the constructs that affect user intention to continue using m-payment.

The present research contributes to research in many domains. The first contribution is the use of the ECM model with the m-payment technology in a different context (Johns, 2006). This is relevant to the local decision makers, m-payment provider, and researchers. Considering that the African context has been little investigated in this domain – even less so Mozambique – this research will benefit the users, academia, researchers, and the companies that are interested in investing in IT related to m–payment. Second, by incorporating the UA cultural dimension as moderator, the current study adds significant contributions to future research on continuance intention and in the domain of mobile payment usage. Third, a mixed-methods approach is applied to bring a narrative and quantitative view of the constructs that affect the intention to

continue to use m-payment (Venkatesh et al., 2016), thereby providing a deeper understanding of the antecedents of continuance intention.

The paper is organized in four sections: (1) introduction; (2) theoretical background, which incorporates all the relevant studies about m-payment, continuance intention, and the cultural dimension, and presents the development model and the hypotheses; (3) the methods to test the hypotheses; and (4) the results, discussion, implications, and conclusion.

5.2. Theoretical background

5.2.1. Mobile payment

M-payment refers to service that performs financial transactions through mobile devices (mobile-phones, smartphones, PDAs, etc.), for goods, services, and bills. It uses wireless technologies (mobile phone networks, NFI, Bluetooth, RFID, etc.) to perform the transaction (Kujala et al., 2017; Liébana-cabanillas et al., 2018; Oliveira et al., 2016). Other authors refer to m-payment as a service to make payments, check balances, and transfer money in a simple way, anytime and anywhere (T. Zhou, 2013, 2014a). There are different ways to conduct a transaction using m-payment. The simplest way is based on using short messages, by which the user can check balances or conduct payments using short messages on a simple mobile phone (T. Zhou, 2013). Another method is by using near field communication NFC), which is established by the proximity of two devices, and the transaction is made (Kujala et al., 2017). The most sophisticated means is by using a mobile application (app). The user downloads the app, installs it on a smartphone, and registers to start using the app.

M-payment continuance intention was studied by Lu et al. (2017), who concluded that privacy protection of post-usage and social influence belief impact users on continuance intention of m-payment. The research of Yu et al. (2018) points out that satisfaction is a relevant predictor influencing m-payment continuance intention, and that trust positively impacts continuance intention via satisfaction. Zhou (2013) posited that flow, satisfaction, and trust influence continuance intention and that m-payment providers need to include quality in the information, system, and service to guarantee

long-term usage. Chen and Li (2017) concluded that satisfaction and postadoption perceived usefulness has a positive impact on the intention to continue to use m-payment. In general, earlier studies were more focused on satisfaction and trust of the m-payment continuance intention (J. Lu, Wei, et al., 2017; Tam et al., 2020; T. Zhou, 2012, 2014a), but quality and performance also play significant roles in m-payment continuance usage.

5.2.2. Mobile payment in the African context

In the African context the telecommunication company Safaricom launched m-payment (M-Pesa) in Kenya in 2007. The m-payment spread rapidly over the continent, and is today used in more than five African countries, and has more than 29 million users (Jack & Suri, 2011; Vodafone Group, 2016). Mozambique also adopted m-payment, and is experiencing dramatic growth, considering that this service is an alternative to bank-based systems for the population to access financial services (Batista & Vicente, 2014; Lagna & Ravishankar, 2021). M-payment was introduced by the Mozambicans Telecommunication Companies MCel (mKesh) and by Vodacom (M-Pesa) (Ortigão et al., 2015). Batista and Vicente (2018) found that m-payment is very important to the rural population to increase financial inclusion. Jack and Suri (2011) argued that m-payment spread very quickly because it is an alternative bank service, and has important impact on people with low income. Kuwornu and Tobbin (2011) reported that perceived ease of use and perceived usefulness were the most important factors of behavioural intention to use m-payment in Ghana. Humbani and Wiese (2018) show that convenience and compatibility positively influence persons to adopt m-payment. Additionally, they showed that gender moderates the relationships between convenience and adoption of m-payment.

5.2.3. Information system continuance model

There are several theoretical models used in IS studies, including the unified theory of acceptance and usage of technology (UTAUT), the technology acceptance model (TAM), and the task technology fit (TTF). We are interested in the theoretical model

concerning IS continuance intention. IS continuance intention research explains determinants that affect the long-term IS usage, investigating the long-term constructs that affect the success of IS (A Bhattacherjee, 2001; Kari et al., 2020; X. Lin et al., 2017). Most research on continuance intention of IS is based on the expectation-confirmation model (ECM). Tam et al. (2020) applied ECM to analyse mobile applications; Gupta et al. (2020) applied it to analyse smart fitness wearables; Susanto et al. (2016) applied it to analyse services of smartphone banking; Gao et al. (2015) applied it to analyse mobile purchasing.

Bhattacherjee (2001) developed the ECM using as a basis the expectation-confirmation theory (Oliver, 1986). The model explained that (1) the intention to continue using IS was strongly impacted by user's satisfaction, followed by user's system perceived usefulness, (2) satisfaction was affected by user's confirmation and perceived usefulness, and (3) user's confirmation was an important determinant of perceived usefulness. The model was extensively tested in IS continuance intention research and confirmed to be a strong model to explain continuance intention in this context (Carillo et al., 2017; Jon Chao Hong, Tai, et al., 2017b; Tam et al., 2020; Venkatesh et al., 2011). User satisfaction is the best construct to enhance behaviour of intention to continue to use IS (Bhattacherjee, 2001).

5.2.4. Cultural dimension

One of the characteristics that represent societies is culture, and it is represented in different ways. Culture can be defined in different ways. Kroeber and Parsons (1958) define culture as the values, ideas, or systems of symbols that represent human behaviour. Hofstede (1984) defines it as collective instructions of the mind that are used to categorize groups of people. Nevertheless, many studies show that culture is a significant determinant for IS usage. Just as IS brings benefits to culture, such as unity, culture influences the way that IS is accepted by people (Salehan et al., 2018). The Hofstede (1984) cultural dimensions are the most used in the IS literature. Baptista and Oliveira (2015) used Hofstede's culture dimensions with UTAUT2 to understand mobile banking. Salehan et al. (2018) used technology determinism theory (TDT) and Hofstede's cultural dimension to understand the effects of technology on culture.

Hallikainen and Laukkanen (2018) used trust with Hofstede's cultural dimensions to investigate the effect of national culture on consumer trust in e-commerce. Additionally, many studies have used cultural dimensions as moderators and as direct effect. However, in this study, it is used as a moderator of the ECM model to understand continuance intention to use m-payment.

5.3. Model development

Our model is established on Bhattacherjee (2001), who demonstrated that the ECM provides a significant contribution to continuance intention to use IS. As it was seen in the literature review, some of the studies performed their research based on ECM (Shao et al., 2019; Susanto et al., 2016). Considering that Hofstede's cultural dimensions is a well-established approach in the context of IS (Leidner & Kayworth, 2006), we will use the uncertainty avoidance dimension because it is one of the most applied dimensions (Baptista & Oliveira, 2015; Liébana-cabanillas et al., 2018; Tam & Oliveira, 2019), and plays an important role in how people will continue to use IS/IT or not. The uncertainty avoidance is a construct that represents cultural behaviour; therefore, we aim to determine if the level of uncertainty avoidance affects the relationships of the ECM model. We believe that this framework can give strong explanatory power to the essential constructs of ECM. For these reasons, in this study we propose a combination of ECM and uncertainty avoidance as moderators to explain m-payment continuance intention. Figure 5.1 illustrates the proposed model of ECM combined with uncertainty avoidance. ECM measures the expectations of individuals and their satisfaction, and with the inclusion of cultural behaviour it will provide better explanation of long-term usage of m-payment. The hypotheses are discussed below.

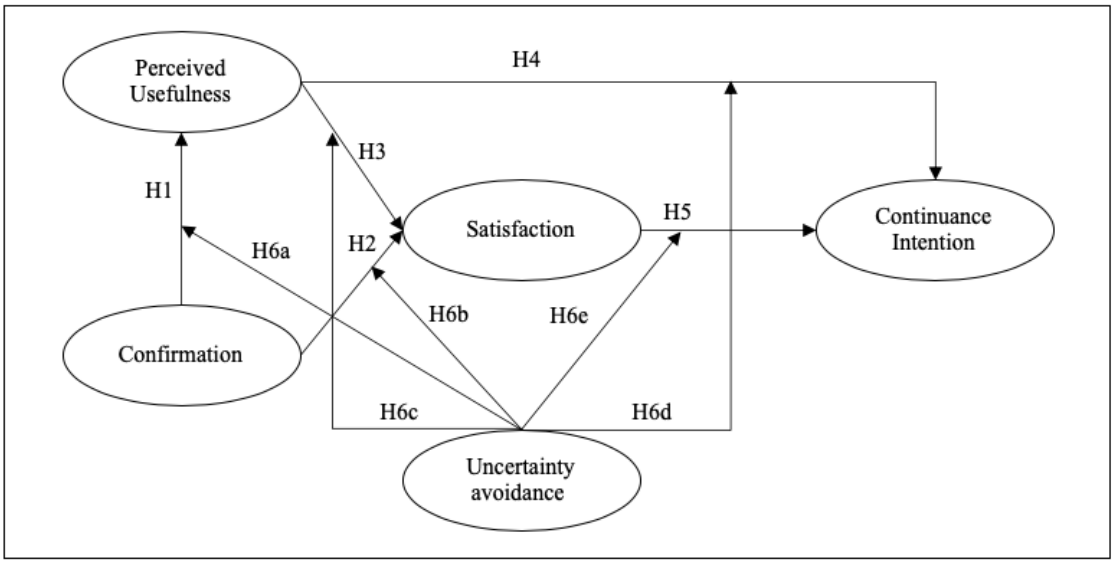

Figure 5.1 - Proposed model

The confirmation refers to the expectations that the users have in using the IS. The users make their evaluation when comparing their initial benefits with the expected benefits. The ECM shows that the positive effects of confirmation will impact the satisfaction and perceived usefulness (Alraimi et al., 2015; Oghuma et al., 2016). When the initial expectation of users is confirmed, it affects the level of the user satisfaction and perceived benefits of IS (Susanto et al., 2016). For m-payment, the user who confirmed the expectations can realize the benefits and influence the satisfaction. Therefore, we hypothesize:

H1. Confirmation positively impacts the m-payment perceived usefulness.

H2. Confirmation positively impacts the m-payment satisfaction.

The determinant that affects the users to consider that IS enhances their effectiveness, performance, or productivity is perceived usefulness (C. M. Chiu & Wang, 2008; Davis, 1989). This means, when users perceive the benefits of the IS, the long-term usage is reinforced (Lee, 2010; Rezvani et al., 2017). ECM postulates that when the expected benefits are confirmed, the user realizes the advantage, which consequently influences positively their satisfaction and long-term usage. In our study, when the m-

payment user feels that using m-payment is useful and enhances his or her performance, he or she will be more satisfied and will continue using it (Cho, 2016; Joo et al., 2018; Shin et al., 2017). We hypothesize:

H3. Perceived usefulness positively impacts the m-payment satisfaction.

H4. Perceived usefulness positively impacts the m-payment continuance intention.

Satisfaction is the extent to which a user acquires a positive feeling by using m-payment resulting from the usage experiences and performance outcomes (A. Bhattacherjee & Lin, 2014). When the IS leaves the user satisfied, the long-term relationships become stronger (Yu et al., 2018). The ECM postulates that user satisfaction is the central reason for the continuance intention of IS (A Bhattacherjee, 2001). Bhattacherjee (2001) validated empirically that the relationship satisfaction on continuance intention was the strongest. Other research also demonstrate that satisfaction of the user strongly influence intention to continue to use IS (Cho, 2016; Joo et al., 2018; Shin et al., 2017). In our study, if the m-payment user feels satisfied, the long-term usage will be guaranteed. Therefore, we hypothesize:

H5. Satisfaction positively impacts the m-payment continuance intention.

5.3.1. Moderation role of uncertainty avoidance

Confirmation refers to the user's evaluations toward a product, service, or technology, whether it is positive or negative. The positive confirmation is when the user reaches the initial expectations, while the negative confirmation is when the user does not reach the initial expectations (Alraimi et al., 2015; Oghuma et al., 2016). Users make their assessments when comparing their initial expectations with the efficiency of the product, service, or technology. The confirmation of expectation is when m-payment services enhance the user's perceived usefulness and satisfaction of the service (Susanto et al., 2016). Given the cultural aspect of the users, they will have attitudes that vary according to the context.

Uncertainty avoidance is the attitude that the user takes to avoid ambiguous or unknown situations (Hofstede, 1984). A low level of uncertainty avoidance means that people are not averse to taking risks. Thus, there is a greater degree of acceptance for new technologies. The low-level of uncertainty avoidance of users of a given cultural context is a factor that supports the relationship between the user satisfaction and confirmation. Uncertainty avoidance also influences the relationship among perceived usefulness and confirmation. The influence of the uncertainty avoidance on these relationships increases user's satisfaction and perceived usefulness. We hypothesize:

H6a. Uncertainty avoidance positively moderates the impact of the confirmation on perceived usefulness of m-payment.

H6b. Uncertainty avoidance positively moderates the impact of the confirmation on satisfaction of m-payment.

The factor that may help an individual to start to understand the advantages in terms of utilization of the IS is perceived usefulness (Davis, 1989). This means, when the users perceive the improvement of using the services and system, the long-term relationship is reinforced (Lee, 2010; Rezvani et al., 2017). However, for m-payment, perceived usefulness is important because it enables the frequent use of m-payment. Given the cultural context of the users, the uncertainty avoidance level can be low or high. Low level is an indicator that users will use m-payment services with little hesitation, while high-level of uncertainty avoidance is an indicator that users will use m-payment services with much hesitation. The user uncertainty avoidance low level of a given cultural context is a factor that favours the relationship among the satisfaction and perceived usefulness. The uncertainty avoidance also influences the relationship among perceived usefulness and the intention to continue to use m-payment. We hypothesize:

H6c. Uncertainty avoidance has a positive impact on the moderation of perceived usefulness on satisfaction of m-payment.

H6d. Uncertainty avoidance positively impacts the moderation of perceived usefulness on m-payment continuance intention.

Satisfaction is the degree to which an individual is comfortable using m-payment services due to usage experiences and performance outcomes, meaning that satisfaction starts to become stronger after the users adopt the service or system (A. Bhattacherjee & Lin, 2014). When users are satisfied with the service, long-term relationships become stronger (Yu et al., 2018). The level of uncertainty avoidance may influence the increase or decrease of the impact on the relationship between satisfaction and the m-payment continuance intention. Given the cultural context of the users, the low level of uncertainty avoidance will positively influence the relationship between satisfaction and the m-payment continuance intention. We hypothesize:

H6e. Uncertainty avoidance positively impacts the moderation of satisfaction and the m-payment continuance intention.

5.4. Research methods

The current research employs a mixed-methods approach (Soffer & Hadar, 2007; Venkatesh et al., 2013). First, was applied the quantitative method, in which the main method of data collection was an online survey (Alraimi et al., 2015; Tam & Oliveira, 2016b). A questionnaire was constructed for the survey using variables and items from the research (Appendix A). The measurement items of the model were adopted from published studies and for uncertain avoidance we adopted from Srite and Karahanna (2006). Items for continuance intention, satisfaction, perceived usefulness, and confirmation were adapted from Bhattacherjee (2001). Secondly, we applied a qualitative method to triangulate and obtain additional impressions regarding the findings, and we thus employed field interviews (Venkatesh et al., 2013).

5.4.1. Data

For the quantitative method, a seven-point scale was applied to assess the items, ranging from 1 (totally disagree) to 7 (totally agree). The questionnaire was managed in English and reviewed for content validity by a professional. A professional translator translated

to the Portuguese language, taking into consideration that the survey was administered in Mozambique. The questionnaire was reverse translated to the original language (Brislin, 1970). To validate the instruments, we conducted a pilot test on a group of 30 students (these data were excluded from the final analysis). To elevate the response rate, various strategies were used. First, we applied the "key informant" procedure to collect data (Oliveira, Thomas, et al., 2014; Pinsonneault & Kraemer, 1993), which helped in the identification of qualified respondents. To boost responses to the survey, a follow-up message was sent two months after the initial contact. A total of 384 usable responses were obtained from which 272 were part of the first respondents and 112 were part of the respondents reminded by the follow-up email. Comparing the first and last respondent groups using Kolmogorov–Smirnov (K–S), the tests indicated a lack of non-response bias (Ryans, 1974). Two tests were made to detect the common method bias. Harman's one-factor test (Podsakoff et al., 2003). The first construct explains 36.7% of variance, it acknowledges that any of the constructs individually account for greater variance. Second, using a marker variable procedure (Lindell & Whitney, 2001), adding a theoretically irrelevant marker variable in the study's model, obtaining 0.040 (4.0%) as the maximum shared variance with other variables; the value can be considered as low (Johnson et al., 2011). We therefore found no significant common method bias. The data were collected between July 2018 and January 2019. Statistics show that 64% of the respondents were professional workers, of which 59% were men, and that 39% had used m-payment one to four times during the preceding three months (see Table 5.1).

For the qualitative method we employed field interviews to explain the motivations of users regarding the intention to continue to use m-payment (Soffer and Hadar, 2007). To collect different perspectives of m-payment, we interviewed seven people, selected randomly, the first and second interviewees (I1 and I2) were information technology (IT) students, I3 a bank officer, I4 an IT technician, I5 an entrepreneur, and I6 and I7 were university professors. M-payment users are identified as individuals who use m-payment services (e.g., M-Pesa or Mkesh in Mozambique). The interviews were conducted using the items of the theoretical model proposed in the study.

Table 5.1 - Sample characteristics

Age		
< 25	129	34%
25 - 30	122	32%
31 - 40	85	22%
41 - 50	39	10%
> 50	9	2%
Gender		
Female	158	41%
Male	226	59%
Education		
High school or below	91	24%
Bachelor's degree	179	47%
Master's degree or higher	114	30%
Employment		
Students	99	26%
Professional workers	244	64%
Retired	1	0%
Unemployed	40	10%
Marital status		
Single	187	49%
Married	86	22%
Divorced	23	6%
Widowed	10	3%
Marriage in fact (cohabitation)	75	20%
Do not know answers	3	1%
M-payment usage frequency (time / 3 months)		
1 - 4	149	39%
5 - 10	98	26%
> 10	137	36%

5.4.2. Data analysis and results

To test and assess the research hypotheses of the model, we applied partial least squares - structural equation modelling (PLS-SEM), Smart PLS 3 (Ringle et al., 2015). Earlier research has recognized the potential of PLS-SEM for theory development (Alraimi et al., 2015; Côrte-Real et al., 2020; Tam & Oliveira, 2016b). Additionally, the data do not have normal distribution, the research model is complex, and has not been tested in previous research. Therefore, PLS-SEM is appropriate for the current research.

5.4.3. Measurement model

The measurement model assessment was conducted by applying (1) indicator reliability (considering good loading greater than 0.70, and thus excluding CI4), (2) construct reliability (using composite reliability (CR) indicator, good CR greater than 0.70), (3)

convergent validity (using average variance extracted (AVE), good AVE greater than 0.50) (Fornell & Larcker, 1981; Hair Jr. et al., 2016; Henseler et al., 2009), and (4) discriminant validity. The findings are shown in Tables 5.2 and 5.3.

Table 5.2 - Construct Reliability and Validity

Constructs	**AVE**	**Composite Reliability**	**Cronbach's Alpha**	**Item**	**Loadings**	**t-value**
Confirmation	0.666	0.857	0.749	**C1**	0.820	35.782
				C2	0.839	35.733
				C3	0.787	27.602
Perceived usefulness	0.615	0.865	0.791	**PU1**	0.767	25.937
				PU2	0.805	31.442
				PU3	0.810	37.051
				PU4	0.755	22.124
Satisfaction	0.721	0.886	0.807	**S1**	0.859	55,392
				S2	0.858	52.386
				S3	0.832	37,340
Continuance intention	0.567	0.834	0.739	**CI1**	0.829	44.778
				CI2	0.815	30.272
				CI3	0.831	45.300
Uncertainty avoidance	0.631	0.873	0.806	**UA1**	0.788	33.868
				UA2	0.809	34.681
				UA3	0.807	28,310
				UA4	0.774	24,918

Table 5.3 - Fornell-Larcker Criterion

	Mean	STDEV	C	PU	S	CI	UA
Confirmation	4.449	1.198	0.816				
Perceived usefulness	4.597	1.175	0.631	0.784			
Satisfaction	4.610	1.250	0.676	0.600	0.849		
Continuance intention	4.635	1.144	0.469	0.489	0.462	0.753	
Uncertainty avoidance	4.923	1.186	0.346	0.357	0.281	0.459	0.794

All constructs met the above-described standards, thereby ensuring convergence. This shows that the factors can be applied to test the theoretical model. The Fornell-Larcker test was used to assess (4) discriminant validity. The AVE square root of each factor should be greater than the correlation among the factors (Fornell and Larcker, 1981) (see Table 5.3). Further, we examined cross-loadings criteria (Appendix B), and the heterotrait-monotrait ratio of correlations (HTMT) (Appendix C). The items show higher loading on their corresponding constructs than the cross-loadings, thereby ensuring discriminant validity (Chinn, 1998; Götz et al., 2010). All of the HTMT values are below 0.90, thus concluded for discriminant validity (Henseler et al., 2015). The

results indicate that the factors are statistically different and can be assessed in the structural model. The measurement model findings show a good indicator reliability, construct reliability, convergence validity, and discriminant validity.

5.4.4. Structural model

The structural model was examined after the confirmation of the measurement model, using the path coefficients, variance inflation factor (VIF), t-statistic value, and variance explained (R^2) to test the hypotheses and the constructs (see Figure 5.2). The structural model used 5,000 bootstrap resamples to evaluate the paths' significance (Henseler et al., 2009). VIF was used to assess the multicollinearity, all constructs met the criteria with values below 5, and thus it can be concluded that there is an absence of multicollinearity (Hair Jr. et al., 2016).

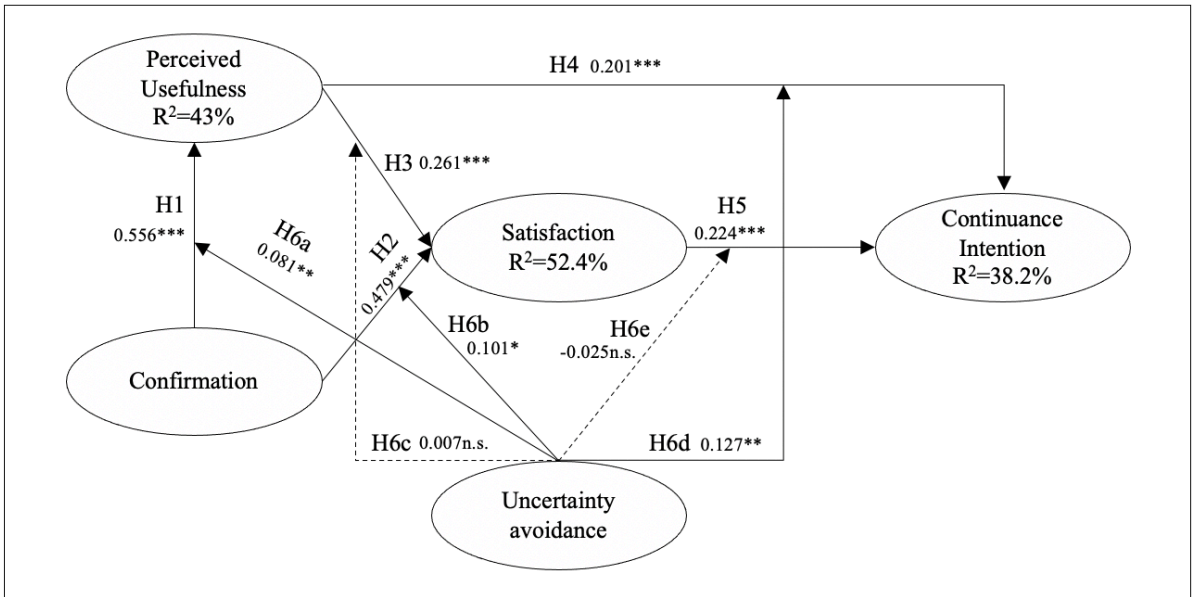

Figure 5.2 - Research model (*=p<0.10; **=p<0.05; ***=p<0.01).

The structural model explains 43.0% of the variation in perceived usefulness. The confirmation ($\hat{\beta}$ = 0.556, p < 0.01) is statistically significant in explaining perceived usefulness, supporting hypothesis H1. Moreover, the research model explains 52.4% of the variation in satisfaction. Confirmation ($\hat{\beta}$ = 0.479, p < 0.01) and perceived

usefulness ($\hat{\beta}$ = 0.261, p < 0.01) are statistically significant in explaining satisfaction, supporting hypotheses H2 and H3. The research model explains 38.2% of variation in continuance intention, explained by perceived usefulness ($\hat{\beta}$ = 0.201, p < 0.01) and satisfaction ($\hat{\beta}$ = 0.224, p < 0.01), supporting hypotheses H4 and H5.

Additionally, five moderating models were examined (H6a, H6b, H6c, H6d, and H6e). The results show that H6a ($\hat{\beta}$ = 0.081, p < 0.05), H6b ($\hat{\beta}$ = 0.101, p < 0.10), and H6d ($\hat{\beta}$ = 0.127, p < 0.05) were statistically significant, thus supporting hypotheses H6a, H6b, and H6d. The hypotheses H6c ($\hat{\beta}$ = 0.007, p < 0.10) and H6e ($\hat{\beta}$ = -0.025, p < 0.10) were not statistically significant.

5.5. Discussion

This study assesses the impact of cultural dimension uncertainty avoidance on the ECM model for m-payment. As far as we know it is the first empirical research that examines ECM taking into consideration the moderation effect of uncertainty avoidance. By applying a mixed-methods approach we were able to explore the qualitative view of the antecedents of the intention to continue to use m-payment. Table 5.4 shows a summary of the findings of the hypothesis's conclusions. As expected, all of the model relationships were supported (A Bhattacherjee, 2001). This finding is in line with those reported in other studies (X. Lin et al., 2017; Susanto et al., 2016). Furthermore, our findings indicate that confirmation of expectation positively impacts the satisfaction and perceived usefulness of m-payment. This means that the experiences using m-payment were positive and user expectations were confirmed (Cheng, 2014; Tam et al., 2020). In a qualitative view, the interviewees I1, I2, and I5 (IT students and entrepreneur) highlighted the perception of usefulness and the feeling of satisfaction with m-payment, stating that they can easily pay for school and food expenses. The I5 (entrepreneur) highlighted the ease of selling products, because most customers chose to pay with m-payment because of the facilities, and they did not use the traditional method via cash, mainly because of the COVID-19. They also reported the facilities to carry out transactions, anywhere and anytime, offering greater availability, fast and safe, simplifying their daily lives, especially for those who live far from urban centres.

The perceived usefulness positively impacts the satisfaction and continuance intention. Meaning that when users perceive performance, effectiveness, or benefits on m-payment, satisfaction will be confirmed, consequently influencing continuance intention. All the interviewees remarked extensively about the usefulness of m-payment, in different aspects; for the IT students (I1 and I2) it is useful for paying fees and purchasing food; for bankers it is useful because it reduces the number of people needing to use bank services; and also, for personal expenses, goods, and services such as gas, water, and electricity. Moreover, the interviewees argued that m-payment has great utility, especially nowadays with the COVID-19 pandemic, facilitating transactions from home or anywhere and anytime, reducing distances, and saving time – thus, allowing to allocate time for other activities and helping to reduce the risk of contamination by the coronavirus.

The results indicate that satisfaction positively influences continuance intention. This means that when the user is happy and delighted, they will continue to use m-payment. The interviewees I1, I2 and I5 (IT students and entrepreneur) greatly emphasized their satisfaction with m-payment and argued that it is a very important factor for the intention to continue to use m-payment. They mentioned ease of use and the ability to use it anywhere and anytime, especially at this time of the COVID-19 pandemic. They indicated their satisfaction because they can pay basic expenses such as water, energy, and TV from home, thereby reducing travel and the number of coronavirus infections. The m-payment makes user's lives much easier. It is widely used at the national level. The pandemic accelerated use, mainly because of government-imposed containment rules and because the users should avoid touching objects such as ATM, POS, doorknobs, etc.

Table 5.4 - Hypotheses results

Hypotheses	Independent Construct	→	Dependent construct	Findings (β)	P value	Conclusion
H1	Confirmation	→	Perceived usefulness	0.556	< 0.01	Supported
H2	Confirmation	→	Satisfaction	0.479	< 0.01	Supported
H3	Perceived usefulness	→	Satisfaction	0.261	< 0.01	Supported
H4	Perceived usefulness	→	Continuance intention	0.201	< 0.01	Supported
H5	Satisfaction	→	Continuance intention	0.224	< 0.01	Supported

H6a	Confirmation * uncertainty avoidance	→	Perceived usefulness	0.081	< 0.05	Supported
H6b	Confirmation * uncertainty avoidance	→	Satisfaction	0.101	< 0.10	Supported
H6c	Perceived usefulness * uncertainty avoidance	→	Satisfaction	0.007	> 0.10	Not supported
H6d	Perceived usefulness * uncertainty avoidance	→	Continuance intention	0.127	< 0.05	Supported
H6e	Satisfaction * uncertainty avoidance	→	Continuance intention	-0.025	> 0.10	Not supported

The results show that uncertainty avoidance moderated the relationships among confirmation and perceive usefulness (H6a), confirmation and satisfaction (H6b), and perceived usefulness and continuance intention (H6d). The users consider instructions and procedures to be important because they make clear how to use the m-payment service and how to solve basic problems using m-payment, thus avoiding failures, preventing users from asking for help from strangers, and untrusted people. M-payment providers should ensure that the instructions to use m-payment are clear, ease to read, understandable, and easily accessible, to facilitate user comprehension, considering that the level of understanding is different and particularly in Mozambique, where level of literacy is low. All interviewees stated that they are satisfied using m-payment, especially in the situation we live in now, with the COVID-19 pandemic, because m-payment helps to carry out transactions in any time and place, thus avoiding the circulation of people.

Figure 5.3 shows that uncertainty avoidance has a statistically significant effect on the moderation of confirmation over the perceived usefulness and satisfaction, and perceived usefulness over continuance intention. Figure 5.3A shows that the high levels of uncertainty avoidance increase the confirmation effect for perceived usefulness of m-payment. When the confirmation is moderated by uncertainty avoidance, it is verified that the impact to explain perceived usefulness will be high. This means that for individuals with a tendency for high level of uncertainty avoidance, the moderator effect proposes a considerable impact of high confirmation on perceived usefulness. In Figure 5.3B it is seen that when the relationship between confirmation to satisfaction is moderated by uncertainty avoidance, the high level of uncertainty avoidance proposes a considerable impact of high confirmation over user's satisfaction on m-payment. This means that individuals with a high level of uncertainty avoidance in a context of high

confirmation will likely experience a strong impact on user satisfaction. In Figure 5.3C, in the relationship between perceived usefulness to continuance intention, the moderation effect of uncertainty avoidance suggests a major effect of perceived usefulness to continuance intention when uncertainty avoidance is high.

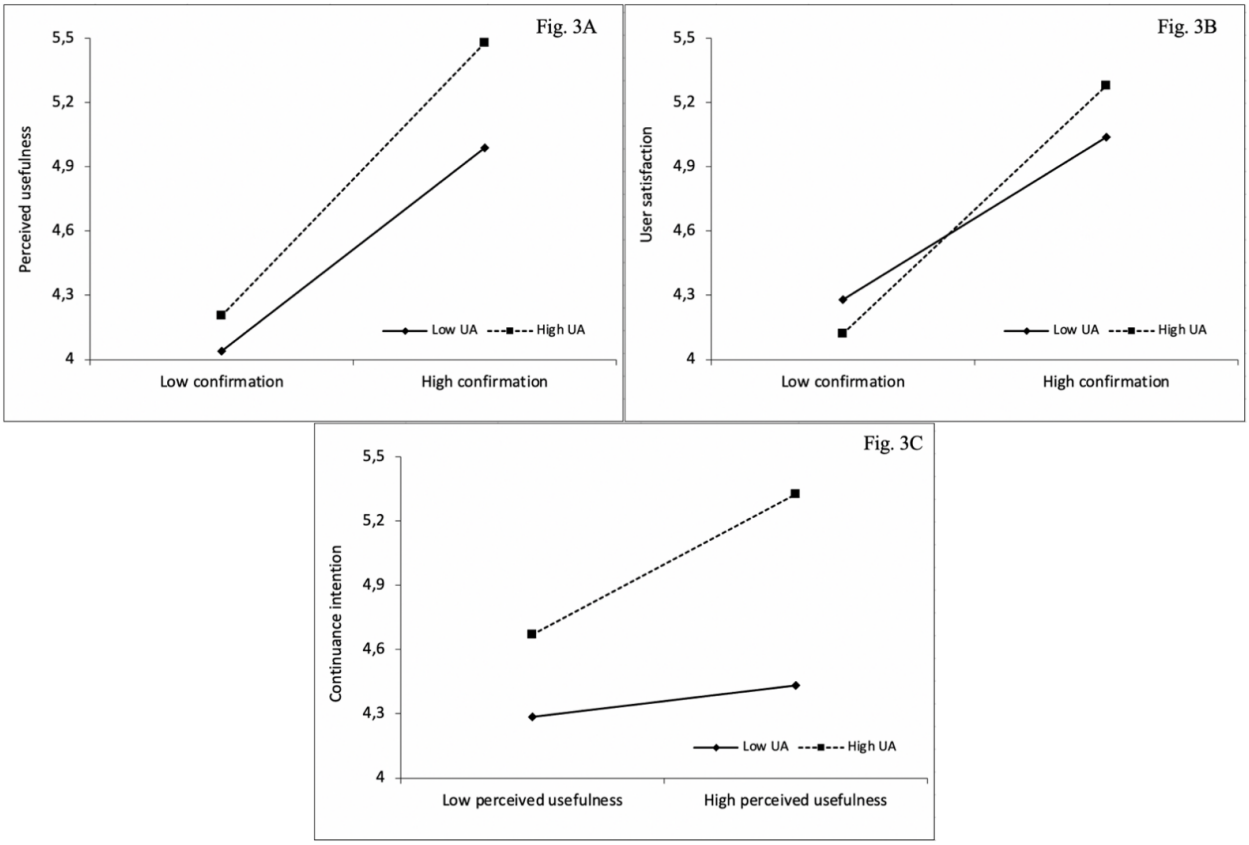

Figure 5.3 (3A, 3B, 3C) - Moderation effect of uncertainty avoidance (UA).

5.5.1. Theoretical and practical implications

The current study investigates the effects of the uncertainty avoidance cultural dimension in the ECM model using the m-payment case. Most of the studies that have used ECM integrated it with other models, some used self-factors (Shih Chih Chen et al., 2013; Limayem & Cheung, 2008; Susanto et al., 2016), a few studies used self-constructs as moderators (Baptista & Oliveira, 2015; de Luna et al., 2019; Tam & Oliveira, 2019), and a few studies tested its direct relationship (Lee et al., 2007). The

current research enriches the body of literature on ECM by extending the scope of IS continuance intention to the m-payment context and reveals the roles of confirmation, perceived usefulness, satisfaction, and the moderating role of uncertainty avoidance in predicting continuance intention. Our findings are in line with the literature about the ECM model. All the ECM relationships are confirmed. We found that the relationships between confirmation on satisfaction and perceived usefulness are statistically significant; the relationships between perceived usefulness on satisfaction and continuance intention are statistically significant; and the relationship between satisfaction on continuance intention is statistically significant. In our sample the strongest relationships in m-payment context were confirmation on satisfaction and perceived usefulness, and perceived usefulness on satisfaction. The moderator effects were tested in all the relationships of the ECM model, three of the five relationships were statistically significant. The findings showed that uncertainty avoidance moderates the relationships between confirmation on satisfaction and perceived usefulness, and perceived usefulness on continuance intention. By applying mixed-methods, we were able to offer a holistic explanation of the antecedents of the intention to continue to use m-payment. Also, considering that Mozambique is still consolidating the adoption phase of m-payment ((Batista & Vicente, 2014, 2018) the cultural factor played a significant role in the moderation of the continuous use of m-payment. Combining the ECM model and the cultural dimension can bring new ideas and knowledge. Additionally, the model revealed that uncertainty avoidance positively impacts the moderation of most of the relationships of the ECM model.

From a practical point of view, there are important implications for users and managers. The study was concentrated on the postadoption and retention of users of m-payment. Realizing the impact of the moderation of culture in continuance intention could help devise new local strategies for m-payment. The results confirm the relevance of uncertainty avoidance in the ECM moderation. The results suggest that the instructions, the regulations, and the procedures for m-payment use influence the confirmation of expectations and thereby the user to perceive the usefulness, performance, and productivity. This implies that the managers should provide users with guidelines including all the instructions, procedures, and regulations to facilitate and help the users to operate with m-payment, thus contributing to user's satisfaction. The results also

suggest that confirmation of expectations of m-payment supported by instructions and regulations influences the user's satisfaction. We repeat our suggestion that managers provide user's guidelines for m-payment, with the purpose of safeguarding their retention. With the support of instruction manuals, users will more easily and frequently use m-payment, and over time will come to perceive its benefits and the increase of efficiency it provides. This in turn will increase the frequency of the use and continuous use of m-payment. With the above-mentioned factors, users will lose the interest to discontinue m-payment use and will keep the service in the foreground to make payments for products and services. Understanding culture could be important in the development and management of solutions for m-payment. For example, with the high level of uncertainty avoidance, managers could focus on mitigating uncertainty and risk, and ensuring the comprehension of the service for users, to positively influence continuous use.

5.5.2. Limitations and future research

The present research has some limitations. First, regarding the sample, the data were collected in universities, thereby attracting a highly educated population. However, most of the m-payment users in Mozambique are not university students, and future studies could collect the data in different environments such as markets, companies, and communities. Second, we used the cultural dimension of uncertainty avoidance to moderate the ECM model. Considering that there are other cultural dimensions, it is recommended in future studies to use all dimensions, with the purpose of bringing more insight. Additionally, knowing that culture varies from country to country, it is recommended to conduct a cross culture research. Finally, the data were collected in Mozambique, and to improve the generalization it would be important to compare distinct countries.

5.6. Conclusion

Considering the cultural factor to be important in the continuous use of an IS, we proposed a model that combines ECM with one of Hofstede's cultural dimensions

(uncertainty avoidance). We applied a mixed-methods approach to our research. It was discovered that uncertainty avoidance moderates the relationships between confirmation on satisfaction and perceived usefulness, and perceived usefulness on continuance intention. Thus, culture plays a significant role in ensuring usefulness, satisfaction, and continuous use of m-payment. This study contributes to the literature with a simple model to explain the continuous use of m-payment through culture. For the managers, understanding the impact of culture in the use of m-payment would help to attract and retain more users. For instance, making available simple manuals with instructions and rules for usage can help the use of m-payment.

Chapter 6 – Conclusions

6.1. Summary of results

The main objective of this paper is to determine the main determinants of the continuance intention to use m-payment. We conducted four quantitative studies (Chapter 2 to Chapter 5), one literature review and three empirical studies that analyse the effects of different factors and models on the intention to continue using m-payment. Table 6.1 summarizes the statistical results of the relationships of the different models analysed in the studies.

Table 6.1 - Relationships analyses in all the studies

Independent Construct	Dependent construct	Chapter 2	Chapter 3	Chapter 4	Chapter 5
Continuance intention	Continuance behaviour	0.375			
Attitude	Continuance intention	0.441			
Flow	Continuance intention	0.358			
Subjective norms	Continuance intention	0.179			
Hedonic value	Continuance intention	0.437			
Utilitarian value	Continuance intention	0.242			
Affective commitment	Continuance intention	0.556			
Trust	Continuance intention	0.239			
Perceived enjoyment	Continuance intention	0.187			
Performance	Continuance intention	0.241			
Habit	Continuance intention	0.255			
Perceived behaviour control	Continuance intention	0.296			
Use	Continuance intention		0.272	0.328	
Satisfaction	Continuance intention	0.416	0.162		0.224
Perceived usefulness	Continuance intention	0.285	0.016 (ns)		0.201
Individual performance	Continuance intention		0.310	0.350	
Overall trust	Continuance intention			0.099	
Service quality	Satisfaction		0.067 (ns)		
System quality	Satisfaction	0.279	0.065 (ns)		
Confirmation	Satisfaction	0.431	0.389		0.479
Use	Satisfaction		0.240		
Perceived usefulness	Satisfaction	0.248	0.136		0.261
Information quality	Satisfaction	0.248	0.152		
Disconfirmation	Satisfaction	0.576			
Perceived ease of use	Satisfaction	0.188			

Perceived enjoyment	Satisfaction	0.251			
Confirmation	Perceived usefulness	0.504	0.566		0.556
Disconfirmation	Perceived usefulness	0.174			
Perceived ease of use	Perceived usefulness	0.327			
System quality	Confirmation		0.116 (ns)		
Service quality	Confirmation		0.275		
Information quality	Confirmation		0.359		
Use	Individual performance		0.416	0.275	
Satisfaction	Individual performance		0.146		
Task technology fit	Individual performance			0.500	
System quality	Use		0.088 (ns)		
Service quality	Use		0.225		
Information quality	Use		0.400		
Task technology fit	Use			0.342	
Overall trust	Use			0.315	
Benevolence	Overall trust			0.333	
Competence	Overall trust			0.246	
Integrity	Overall trust			0.247	
Relational capital	Affective commitment	0.258			
Utilitarian value	Affective commitment	0.112			
Hedonic value	Affective commitment	0.339			
Satisfaction	Attitude	0.481			
Perceived usefulness	Attitude	0.408			
Confirmation	Perceived enjoyment	0.622			
Confirmation	Perceived ease of use	0.458			

Note: ns (not statistically significant)

The results of the literature review show that the most used technologies were e-learning and social network services. The most used theoretical models to study the intention to continue to use were ECM, TAM, and ECT. Additionally, few studies used a single theory, most studies integrated more than one theory. A theoretical model was presented based on the significant constructs from meta-analysis and best predictor from weight analysis. Of the 600 relationships collected from 115 studies, 60 relationships were analysed three or more times. Of these relationships, 31 were classified as "best predictors" and 24 were classified as "promising predictors". The most studied regions were East Asia, North America, Europe, Middle East, South America, and Southwest Asia. No studies were found for the African region.

In the first empirical study, the intention to continue using m-payment in an African context was analysed, combining ECM with D&M ISSM. The results show that the use of m-payment, satisfaction, and perceived individual performance are the most important factors to explain the continuance intention to use m-payment. Information quality and service quality positively impact the use and confirmation of the expectations. Information quality, use, and confirmation of expectations positively impact user satisfaction.

In the second empirical study, intention to continue using m-payment was analysed by integrating TTF, overall trust, and ECM. The results show that the most important factors explaining the intention to continue using m-payment are individual performance, use, and overall trust. Individual performance and use play important roles as partial mediators between use-continuance intention and overall trust-continuance intention. Our results show that satisfaction has significant importance as a moderator between use and overall trust on continuance intention.

In the last empirical study, the impact of culture on the intention to continue using m-payment was analysed using a mixed-methods approach based on quantitative data and field interviews. The results show that the cultural factor uncertainty avoidance moderates the relationships between confirmation on satisfaction and confirmation on perceived usefulness, and perceived usefulness on continuance intention. In a qualitative view, most of the interviewees highlighted the importance of m-payment in their daily lives, especially for those who live far from urban centres. Thus, it was found that the culture plays a significant role in ensuring usefulness, satisfaction, and the continuance intention to use m-payment.

6.2. Contributions

6.2.1. Implications for theory

This dissertation provides several contributions for research. The quantitative approach of the literature review contributes to research by providing a more concise, clearer, and extensive image of the constructs evaluated in previous studies in various subject areas on continuance intention to use IS from years 2001 to 2017, serving as the basis

for future research and contributing for researchers to accurately select the constructs to be included in research models to assess m-payment continuance intention. Moreover, the results show that there is a wide variety of constructs coming from different theories and contexts that can significantly influence continuance intention, thus demonstrating that different theories and self-constructs can be integrated into the ISCI context.

In Chapter 3 we proposed the joining of D&M ISSM and the ECM model, with the aim of identifying antecedents that focus on satisfaction, individual performance, and continuance intention. The findings provide support for the importance of the added constructs from DeLone and Mclean (2003) in users' continuance intention to use m-payment. As another theoretical implication the model validates IS continuance intention theory for the case of m-payment use in Mozambique, unlike previous studies that focused on developed economies (X. Chen & Li, 2017; Fan et al., 2018a).

In Chapter 4 we advanced the body of knowledge of m-payment by proposing the investigation of continuance intention to use m-payment integrating ECM, TTF, and overall trust. The results indicate that both TTF and overall trust are important and should be considered when evaluating the continuance intention to use m-payment. To the best of our knowledge very few studies have addressed continuance intention in the African context. Thus, with the proposed model researchers in the IS field can adapt it to suit other situations in the future.

In Chapter 5 we presented the effects of the uncertainty avoidance cultural dimension in the ECM model using the m-payment case, applying mixed-methods, and were able to offer a holistic view of the antecedents of the continuance intention. The current research enriches the body of literature on ECM by extending the scope of IS continuance intention to the m-payment context and reveals the moderating role of uncertainty avoidance in predicting continuance intention. Considering that Mozambique is still consolidating the adoption phase of m-payment (Batista & Vicente, 2014, 2018), the cultural factor plays a significant role in the moderation of the continuous use of m-payment.

6.2.2. Implications for practice

The results of this dissertation have valuable practical implications for managers and decision makers to ensure the users' retention and long-term usage of m-payment. First, according to the findings of our research it is crucial to recognize the best predictors of continuance intention to use an IS, for better design and implementation of the IS (A. Bhattacherjee, 2001; Shao, 2018; Yu et al., 2018). The continuance intention to use an IS has been studied in different countries with different cultures. Therefore, managers should have different managing strategies to ensure the satisfaction of the users and long-term usage of the IS (L. Zhang et al., 2012). Managers and decision makers should provide all the necessary information, such as user guides, advertisements, and flyers that explain the services and functionalities of the IS, to accelerate the understanding of the services.

Second, the m-payment providers should ensure that the information available is correct, up-to-date, and useful to the user. In addition, m-payment providers should help the users whenever they need help, should ensure that users have a good experience with m-payment, should provide services that exceed users' expectations, and ensure that the users can use m-payment easily. This suggests that the m-payment providers should constantly improve the m-payment in features related to safety, ease of use, and information, to provide a well-structured system that is easy to navigate and has useful information.

Third, to promote long-term usage of m-payment, providers should focus on real-time accessibility, real-time services, and services that are quick and secure in order to enhance the task and technology fit of m-payment (Ouyang et al., 2017). In other words, if the provider's goals are to influence the active customers (users) to continue using m-payment, they should provide adequate services to them. Moreover, the m-payment providers should handle m-payment transactions, be truthful to users, act genuinely with users, keep their commitments, and do their best to help users, especially in situations involving fraud, or pending transactions.

Fourth, the findings regarding the impact of culture on continuance intention to use m-payment indicate that managers should provide users with guidelines including all the instructions, procedures, and regulations to facilitate and help the users to operate with

m-payment. With the support of instruction manuals, users will more easily and frequently use m-payment, and over time will come to perceive its benefits and the increase of efficiency it provides. Understanding culture could be important in the development and management of solutions for m-payment. For example, with the high level of uncertainty avoidance, managers could focus on mitigating uncertainty and risk, and ensuring the comprehension of the service for users in order to positively influence continuous use.

6.3. Limitations and future research

The present dissertation contains several limitations. Regarding the literature review, we excluded certain studies because of the unavailability of their quantitative data, or because they were qualitative. Including these studies could generate relevant information in terms of the significance of the constructs. We used meta-essentials, a meta-analysis tool. This tool has limitations, and considering that meta-essentials is not able to perform more advanced analyses with linear models or structured equation modeling (Rhee et al., 2015), future researchers should consider a more advanced tool to provide more insights and a different approach to research. Regarding the three empirical studies presented in Chapters 2, 3, 4, and 5, the data were collected in universities, thereby attracting a highly educated population. However, most of the m-payment users in Mozambique are not university students, and future studies could collect the data in different environments such as markets, companies, and communities, and in a different part of the country or in another African country. This research is related to a single type of technology, m-payment, a comparison with another technology (e.g., m-banking) might reveal other insights and enhance generalization. We used the cultural dimension of uncertainty avoidance, considering that there are other cultural dimensions, it is recommended in future studies to use all the dimensions, with the purpose of bringing more insight. Our models were proposed for and validated in Mozambique, and to generalize the applicability of the study, and to fully represent all potential m-payments users in the African context the samples for future research could be conducted in other African countries.

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Chapter 8 – Appendices

Appendix A. Research studies used in meta-analysis and weight analysis (Ordered by sample size) (chapter 2)

Study	Country	Sample	Theory	Technology
Mohammadyari and Singh, 2015	New Zealand	34	Digital literacy and unified theory of acceptance and use of technology	E-learning
Bhattacherjee et al., 2008	Ukraine	81	Theory of reasoned action, theory of planed behaviour and expectation confirmation model	DMS – lotus notes
Ifinedo, 2017	Canada	108	Social-cognitive theory, technology acceptance model and motivation theory	Blogs for learning
Gallego et al., 2016	Spain	116	Gratifications theory	Social virtual worlds
Bhattacherjee, 2001	United States of America	122	Expectation confirmation theory	Online banking
Sørebø et al., 2009	Norway	124	Self-determination theory and expectation disconfirmation model	E-learning
Cheung et al., 2013	Hong Kong	124	Knowledge sharing, expectation disconfirmation theory and social cognitive theory	Online community
Barnes and Böhringer, 2011	Germany, United States of America, United Kingdom, etc.	131	ECM, habit and critical mass	Microblogging twitter
Budiardjo et al., 2017	Indonesia	131	DeLone and Mclean information system success model and ECM	Knowledge management system
Hong et al., 2016b	Taiwan	132	Cognitive-Affective Theory of Learning with Media	YouTube
Larsen et al., 2009	Norway	135	ECM, task technology fit	E-learning
Hsu and Chiu, 2004	Taiwan	149	TPB	Web-based tax filing service
Hong et al., 2017b	Taiwan	150	ECM	Government E-learning
Yoon and Rolland, 2015	South Korea	150	ECT	Social networking services
Carillo et al., 2015	Italy	150	Information system continuance model	Ubiquitous media systems - smartphone
Chang et al., 2014	Taiwan	166	SCT and Flow theory	Online games
Joo et al., 2018	Korea	166	Self-determination theory, TAM, and ECM	K-MOOC
Kaewkitipong et al., 2016	Thailand	169	UTAUT and ECM	Social media
Roca et al., 2006	Spain	172	TAM, TRA and TPB	E-learning
Premkumar and Bhattacherjee, 2008	United States of America	175	TAM and ED	Computer-based training
Bøe et al., 2015	Norway	177	ECM and Agency theory	E-learning Technology
Chiu et al., 2005	Taiwan	183	EDT, Perceived performance component	E-learning
Sällberg and Bengtsson, 2016	Sweden	192	Motivational model	Computer and smartphone
Kim et al., 2009	Korea	192	Social learning theory and theory of innovation	Mobile banking
Chen et al., 2015	Taiwan	195	ECM, Perceived voluntariness and habit	Teaching blogs
Pereira et al., 2015	Brazil	197	EDT and Virtual learning environment	E-learning
Hong et al., 2016a	Taiwan	200	Gratifications theory	Educational games
Chiu et al., 2007	Taiwan	202	Subjective task value and fairness theory	E-learning
Hong et al., 2015	Taiwan	203	ECM and Social anxiety	Facebook
Kim, 2010	South Korea	207	ECM and TPB	Mobile data service
Joo et al., 2016	Korea	222	TAM and ECM	Mobile learning management system

Study	Country	Sample	Theory	Technology
Limayem et al., 2007	Hong Kong	227	ECM, Habit, Frequency of past behaviour and comprehensiveness of usage	World Wide Web
Lin et al., 2011	Taiwan	230	TRA, negative critical incident and satisfaction	E-learning
Song et al., 2017	United States of America	236	TPB	Smart-connected sports products
Jin et al., 2010	China	240	ECM	Online communities
Zhang et al., 2017a	China	240	Theory of community social organisations and motivation theory	Social network services
Wu and Chen, 2017	China	252	TAM and TTF	MOOCS
Warkentin et al., 2016	United States of America	253	PMT and ECT	Software - zedalert
Choi, 2016	Korea	253	TAM, UTAUT2 and ubiquitous connectivity	Smartphone – social networking services
Lin, 2016	Taiwan	255	TRA, NCI and satisfaction	E-learning
Lin, 2011	Taiwan	256	TRA and NCI	
Vedadi and Warkentin, 2016	United States of America	256	ECT	Mobile banking
Ku and Chen, 2015	Taiwan	256	TAM, ECM and satisfaction	E-tourism Website
Lu and Lee, 2011	Taiwan	268	UTAUT and social-psychological	Blog sharing
Zhou, 2011	China	269	ECT and TAM	Mobile services
Shin and Biocca, 2017	South Korea	271	Trans-theoretical model of behaviour change and ECT	Quantified self (Health)
Zhang et al., 2017b	China	273	ECM, Elaboration likelihood model	Mobile healthcare applications
Sun and Mouakket, 2015	China	275	D/M ISSM and ISCM	Enterprise systems
Hong et al., 2017a	Taiwan	276	diffusion of innovation theory, TAM, ECT, and flow theory	Smartwatch
Chang and Zhu, 2012	China	283	ECT	Social Networking sites
Chiu and Wang, 2008	Taiwan	286	UTAUT	E-learning
Chiu et al., 2007	Taiwan	289	D/M ISSM and fairness theory	E-learning
Kim, 2011	South Korea	292	ECM and subjective norm	Social-networking services
Zhao and Lu, 2012	China	294	EDT	Micro-blogging service
Susanto et al., 2016	Korea	301	ECM	Smartphone banking services
Liao and Shi, 2017	Hong Kong	302	TAM and ECM	Online tourism service
Wang, 2015	Taiwan	304	ECM and TAM	Mobile value-added service
Alraimi et al., 2015	74 countries (United States America, India, Greece, Azerbaijan, etc)	316	ECM	MOOCS
Budner et al., 2017	Germany	321	ECM	Cloud service
Zhou and Li, 2014	China	330	ECM	Mobile social network
Seol et al., 2016	Korea	333	Communicative ecology theory	Social networks sites
Huang, 2016	Taiwan	333	Social penetration theory	Facebook
Lehto and Oinas-Kukkonen, 2015	Finland	333	Persuasive systems design	Health web-based
Oghuma et al., 2016	South Korea	334	ECM	Mobile instant messaging
Belanche et al., 2014	Spain	336	TAM, TPB, Trust transfer	Public e-services
Barnes, 2011	United Kingdom	339	TAM and ECM	Virtual worlds
Hsiao and Chiou, 2012	Taiwan	340	Social capital theory	Massive multiplayer online game
Cho, 2016	Korea	343	post-acceptance model and TAM	Health apps
Choi and Joo, 2016	United States of America	345	D/M ISSM and sense of community	Social cataloguing sites
Hong et al., 2008	Korea	345	TAM, TRA and TPB	Hanaro telecom
Chen, 2007	Taiwan	360	Cognitive dissonance theory, EDT and ECT	Virtual communities, forum, newsletters
Lee, 2010	Taiwan	363	ECM, TAM, TPB and Flow theory	E-learning
Chen et al., 2013	Taiwan	368	Technology readiness and ECM	Mobile services

Study	Country	Sample	Theory	Technology
Hsiao et al., 2016	Taiwan	378	TRA, TPB, TAM, UTAUT and ECM	Mobile social apps
Chen, 2012	Taiwan	390	ECM, SERVQUAL, perceived risk and technology readiness	Mobile banking
Mouakket, 2015	United Arab Emirates	397	ECM	Facebook
Mouakket, 2016	United Arab Emirates	397	ECM	Facebook
Hsu et al., 2006	Taiwan	401	TPB and EDT	Online Shopping, PC home Online
Al-Debei et al., 2013	Jordan	403	TPB	Facebook
Chen et al., 2012	Taiwan	409	ECT and TRA	Web 2.0
Chong, 2015	China	410	ECM, perceived ease of use, perceived usefulness, Trust and perceived cost	M-commerce
Lee and Kwon, 2011	Korea	420	ECM, familiarity and intimacy	Online shopping service
Steelman and Soror, 2017	United States of America	436	ECT and cognitive dissonance theory	Mobile phone
Zhou et al., 2012	China	438	Dedication-constraint framework	Social virtual world services
Liao et al., 2006	Taiwan	446	Trust, habit and continuance intention	B2C web site
Yang and Lin, 2017	Taiwan	451	Theory of consumption values	Social network services, location-based services, and mobile technologies
Gao et al., 2015	China	462	D/M ISSM, flow theory and trust	Mobile purchase
Daıhan and Akkoyunlu, 2016	Turkey	467	Technology continuance theory, cognitive model and ECM	E-learning
Lowry et al., 2015	Hong Kong, China and Taiwan	477	EDT and ECM	Gaming website, Wikipedia, amazon mechanical Turk
Chen et al., 2009	Taiwan	481	TAM, TPB and technology readiness	E-reservation/ticketing, kiosks, ATM, internet or mobile banking/finance/investment
Lin and Bhattacherjee, 2010	Taiwan	485	ECM and interactive hedonic systems	Online video games
Krasnova et al., 2017	Germany	488	ECM, gratification theory, and self-construal theory	Social networking sites
Limayem and Cheung, 2008	Hong Kong	505	ECM, habit and prior behaviour	Internet-based Learning
Limayem and Cheung, 2011	Hong Kong	505	ECM and Habit	Internet-based learning
Hsiao and Chang, 2014	Taiwan	508	ECM, TRA and TAM	Mobile advertising
Abbas and Hamdy, 2015	Kuwait	512	SERVQUAL	Mobile service provider
Bhattacherjee and Lin, 2014	Taiwan	514	ECM	Insurance company
Lin et al., 2017	United States of America	523	ECM and social network sites construct	Facebook
Amoroso and Lim, 2017	Philippine	528	ECM	Mobile applications
Zhong et al., 2015	China	543	TPB and ECM	Mobile travel booking service
Hadji and Degoulet, 2016	France	571	TAM, UTAUT and ECM	Clinical information system
Lu et al., 2017	United States of America	584	UTAUT2 and ECT	Mobile application
French et al., 2017	United States of America	593	TPB, self-determination theory and social capital	Social networking tourism sites
Kang and Lee, 2015	Korea	600	SCT	IM service - NateOn
Lankton and McKnight, 2012	United States of America	600	EDT and performance	Microsoft access
Bhattacherjee and Premkumar, 2004	United States of America	613	EDT and TAM	Computer-based training, rapid application development software
Liang et al., 2013	Taiwan	623	TTF and TPB	Mobile services
Lin et al., 2014	United States of America	742	Self-regulation theory	Facebook
Kang, 2014	United States of America	755	Motivational communication theory and TAM	Mobile application
Zhou et al., 2015	United States of America, Great Britain, etc	828	Perceived benefits, affective commitment and ECM	Social virtual world

Study	Country	Sample	Theory	Technology
Zhou et al., 2014	China	928	Fulfilment perspective, and social benefits	Social virtual world
Ahmad and Sun, 2018	China and Pakistan	496, 441	ECM, Perceived risk and perceived value	Social media mobile applications
Zhao et al., 2012	China	1075	SERVQUAL and justice	Mobile value-added services
Chou et al., 2010	China, Taiwan	2229	ECT, Perceived identity verification and perceived usefulness	Baidu and yahoo
Lee et al., 2007	Korea, Hong Kong, Taiwan	5121	TAM and interaction theory	Mobile internet

Notes: Unified theory of acceptance and use of technology (UTAUT), theory of reasoned action (TRA), theory of planed behaviour (TPB), expectation confirmation model (ECM), technology acceptance model (TAM), expectation confirmation theory (ECT), expectation disconfirmation model (EDM), social cognitive theory (SCT), task technology fit (TTF), media system dependency theory (MDT), expectation disconfirmation theory (EDT), negative critical incident (NCI), information system continuance model (ISCM), protection motivation theory (PMT), DeLone and Mclean information system success model (D/M ISSM), diffusion of innovation theory (DIT), post-acceptance model (PAM), technology continuance theory (TCT), service quality (SERVQUAL), and self-determination theory (SDT).

Appendix B. Number of research studies by Journal (chapter 2)

Nº	Journal	2001 - 05	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
1	AIS Transactions on Replication Research												1	1	2
2	**Behaviour and Information Technology**	**1**					**2**	**4**			**1**	**2**	**1**		**11**
3	**Computers and Education**	**1**		**1**		**1**	**1**	**1**				**3**	**2**	**1**	**11**
4	**Computers in Human Behaviour**					**1**			**2**		**1**	**5**	**5**	**8**	**22**
5	Computers in Industry											1			1
6	Cyberpsychology, Behaviour, and Social Networking							1		1					2
7	Decision Support Systems								2	1	1		1		5
8	Educational Technology Research and Development												1		1
9	Electronic Commerce Research and Applications							1							1
10	European Journal of Information Systems										1	1			2
11	Expert Systems with Applications						1								1
12	Industrial Management and Data Systems					1							1		2
13	**Information and Management**				**2**			**1**	**1**		**2**	**2**		**3**	**11**
14	Information Systems Journal			1		1	1								3
15	Information Technology for Development													1	1
16	International Journal of Business and Management											1			1
17	International Journal of Electronic Commerce			1											1
18	International Journal of Human-Computer Studies		2												2
19	International Journal of Information Management		1											1	2
20	International Journal of Medical Informatics												1		1
21	International Journal of Mobile Communications								1	1	1				3
22	Internet Research										1				1
23	Journal of Biomedical Informatics												1		1
24	Journal of Computer Information Systems				2			1		1		1	1	1	7
25	Journal of Global Information Technology Management													1	1
26	Journal of High Technology Management Research													1	1
27	Journal of Information Science			1											1
28	Journal of Information Systems and Technology Management											1			1
29	Journal of Management Information Systems								1						1

30	Journal of the American Society for Information Science and Technology									1					1
31	Journal of the Association for Information Science and Technology												1		1
32	Journal of the Association for Information Systems								1			1			2
33	Journal of Retailing and Consumer Services													1	1
34	Journal of Strategic Information Systems													1	1
35	Knowledge Management and E-Learning: An International Journal													1	1
36	MIS Quarterly	2		1											3
37	Omega				1										1
38	Service Business											1			1
39	Sport Management Review													1	1
40	Telematics and Informatics												2		2
	Total	4	3	5	5	4	5	9	8	5	8	19	18	22	115

Note: The highlighted journals have more than ten publications.

Appendix C. Definition of variable names (chapter 2)

Study	**Original variable name**	**Selected variable name**
Wang, 2015 Hong et al., 2017b Zhou and Li, 2014 Susanto et al., 2016 Ku and Chen, 2015 Lowry et al., 2015 Bhattacherjee, 2001 Lin and Bhattacherjee, 2010	Continuance Intention Continuance intention to use Continuance usage Continuance Use Intention Continued Usage Intention Intention to continue IS continuance intention Usage Intention	Continuance intention
Yoon and Rolland, 2015 Oghuma et al., 2016 Lankton and McKnight, 2012	Perceived Usefulness Usefulness Usefulness Expectations	Perceived usefulness
Susanto et al., 2016 Lin et al., 2011 Yoon and Rolland, 2015	User Satisfaction Overall Satisfaction Satisfaction	Satisfaction
Chong, 2015 Chen et al., 2013	Confirmation Confirmation of Expectations	Confirmation
Lu et al., 2017 Chong, 2015	Enjoyment Perceived Enjoyment	Perceived enjoyment
Premkumar and Bhattacherjee, 2008 Kang, 2014	Performance Performance Expectancy	Performance

Appendix D. Moderator's description (chapter 2)

Variable	**Description**	**Coding**
Sample size	The sample was classified in two groups: small or large. From the sample number presented in each study, we adopted the median of the sample sizes as the cut-off point.	0 = small 1 = large
Economic development	Economic development was classified using the country reported in the methodology of each study. We checked whether the studies came from developed or developing countries (Zarantonello et al., 2013).	0 = developing 1 = developed
Innovation Level	The innovation level was coded using information from the	0 = low innovation

	Bloomberg Innovation Index 2019. In this case, we obtained the median values of each country of origin of the studies analysed.	1 = high innovation
Power Distance	The power distance was classified using the level (low vs high). The groups were created using the origin of the study and were based on the parameters established by (Hofstede & Minkov, 2010) obtained from the median of the indices of each country.	0 = low power distance 1 = high power distance
Individualism	We coded the degree of individualism (low vs high). The groups followed the same procedures mentioned in the power distance item.	0 = low degree of individualism 1 = high degree of individualism
Masculinity	The degree of masculinity was identified (low vs high). The groups followed the same procedures mentioned in the power distance item.	0 = low degree of masculinity 1 = high degree of masculinity
Uncertainty avoidance	We coded the groups associated with a low level and a high level of uncertainty avoidance. The procedure followed the logic established and quoted in the power distance dimension.	0 = low uncertainty avoidance 1 = high uncertainty avoidance
Long Term orientation	We classified the long-term orientation in two groups (low vs high). Then we have followed the same procedures mentioned in the power distance.	0 = low long-term orientation 1 = high long-term orientation
Indulgence	The procedures mentioned in the power distance was also used in this cultural dimension (low and high level of indulgence).	0 = low indulgence 1 = high indulgence

Appendix E. Questionnaire for the constructs (chapter 4)

Nº	Constructs	Questionnaire Items	Source
1	Competence (COMP)	COMP1. M-payment has the ability to handle my transactions. COMP2. M-payment has sufficient expertise to do business on the network. COMP3. M-payment vendor is very knowledgeable about the technology.	(Oliveira et al., 2017)
2	Integrity (I)	I1. I believe m-payment is honest with its users. I2. I believe m-payment acts sincerely in dealing with users. I3. I believe m-payment is truthful in its dealings with me. I4. I believe m-payment would keep its commitments.	(Oliveira et al., 2017)
3	Benevolence (B)	B1. I believe m-payment would act in my best interest. B2. If I required help, m-payment personnel would do their best to help me. B3. M-payment vendor is interested in my well-being, not just its own.	(Oliveira et al., 2017)
4	Overall Trust (OT)	OT1. I like to trust m-payment. OT2. I find m-payment trustworthy. OT3. I like the reliability of m-payment. OT4. I value the trustworthy characteristics of m-payment.	(Oliveira et al., 2017)
5	Task Technology Fit (TTF)	TTF1. M-payment services are appropriate. TTF2. M-payment account management services are appropriate. TTF3. Real-time m-payment services are appropriate. TTF4. In general, m-payment services are enough.	(Tam & Oliveira, 2016b)
6	Use (U)	U1. I use m-payment. U2. I use m-payment to buy products and services. U3. I use m-payment to make transfers. U3. I use m-payment to withdraw money.	(Tam & Oliveira, 2016b)
7	Individual Performance (IP)	IP1: M-Payment enables me to accomplish tasks more quickly. IP2: M-Payment makes it easier to accomplish tasks.	(Tam & Oliveira, 2016b)

		IP3: M-Payment is useful for my job.	
8	Satisfaction (S)	S1. I am very pleased to use m-payment. S2. I am very happy with m-payment. S3. I am delighted with m-payment.	(A. Bhattacherjee & Lin, 2014)
9	Continuance Intention (CI)	CI1. I intend to continue using m-payment rather than discontinue its use. CI2. My intentions are to continue using m-payment rather than manual processing or other alternative means. CI3. I plan to continue using m-payment in my job.	(A. Bhattacherjee & Lin, 2014)

Appendix F. Cross loadings (chapter 4)

	TTF	**U**	**IP**	**B**	**COMP**	**I**	**OT**	**S**	**CI**
TTF1	**0.757**	0.416	0.501	0.417	0.472	0.483	0.389	0.456	0.515
TTF2	**0.829**	0.353	0.466	0.323	0.351	0.452	0.305	0.365	0.439
TTF3	**0.801**	0.352	0.489	0.323	0.391	0.466	0.216	0.301	0.429
TTF4	**0.690**	0.278	0.471	0.256	0.240	0.286	0.208	0.250	0.296
U1	0.368	**0.837**	0.440	0.329	0.432	0.395	0.346	0.494	0.534
U2	0.354	**0.804**	0.404	0.334	0.464	0.395	0.362	0.497	0.490
U3	0.409	**0.828**	0.405	0.336	0.430	0.392	0.343	0.526	0.422
U4	0.353	**0.764**	0.379	0.311	0.438	0.397	0.378	0.505	0.409
IP1	0.607	0.451	**0.845**	0.350	0.386	0.416	0.328	0.394	0.498
IP2	0.525	0.419	**0.878**	0.352	0.379	0.392	0.361	0.354	0.501
IP3	0.392	0.370	**0.742**	0.365	0.304	0.327	0.400	0.300	0.427
B1	0.322	0.361	0.356	**0.733**	0.374	0.443	0.456	0.399	0.372
B2	0.309	0.300	0.330	**0.819**	0.339	0.422	0.477	0.370	0.357
B3	0.366	0.257	0.289	**0.725**	0.327	0.387	0.385	0.328	0.274
COMP1	0.393	0.453	0.393	0.395	**0.780**	0.518	0.464	0.526	0.462
COMP2	0.295	0.432	0.318	0.296	**0.796**	0.422	0.402	0.443	0.395
COMP3	0.434	0.398	0.310	0.376	**0.781**	0.537	0.435	0.474	0.359
I1	0.429	0.372	0.303	0.376	0.512	**0.768**	0.493	0.426	0.354
I2	0.469	0.378	0.319	0.421	0.526	**0.822**	0.432	0.432	0.419
I3	0.460	0.417	0.421	0.474	0.497	**0.843**	0.485	0.418	0.383
I4	0.404	0.384	0.428	0.482	0.470	**0.748**	0.447	0.381	0.345
OT1	0.308	0.343	0.364	0.529	0.449	0.497	**0.813**	0.405	0.367
OT2	0.296	0.363	0.364	0.430	0.434	0.509	**0.823**	0.392	0.321
OT3	0.312	0.362	0.372	0.430	0.449	0.432	**0.788**	0.383	0.356
OT4	0.264	0.342	0.289	0.467	0.440	0.432	**0.773**	0.475	0.356
S1	0.437	0.634	0.413	0.439	0.561	0.466	0.457	**0.868**	0.432
S2	0.355	0.499	0.324	0.357	0.507	0.460	0.440	**0.860**	0.406
S3	0.354	0.444	0.350	0.435	0.495	0.398	0.421	**0.818**	0.362

CI1	0.437	0.511	0.483	0.349	0.447	0.398	0.370	0.392	**0.837**
CI2	0.473	0.415	0.431	0.373	0.384	0.357	0.323	0.378	**0.811**
CI3	0.474	0.508	0.528	0.389	0.459	0.420	0.397	0.412	**0.854**

Notes: TTF: Task technology fit; U: Use; IP: Individual performance; B: Benevolence; COMP: Competence; I: Integrity; OT: Overall trust; S: Satisfaction; CI: Continuance Intention.

Appendix G. Heterotrait-monotrait ratio of correlations (chapter 4)

	TTF	U	IP	B	COMP	I	OT	S	CI
TTF									
U	0.571								
IP	0.805	0.633							
B	0.618	0.557	0.619						
COMP	0.642	0.722	0.592	0.684					
I	0.695	0.599	0.586	0.769	0.839				
OT	0.459	0.541	0.560	0.804	0.737	0.721			
S	0.562	0.761	0.540	0.673	0.817	0.644	0.639		
CI	0.703	0.711	0.744	0.625	0.698	0.592	0.547	0.592	

Notes: TTF: Task technology fit; U: Use; IP: Individual performance; B: Benevolence; COMP: Competence; I: Integrity; OT: Overall trust; S: Satisfaction; CI: Continuance Intention.

Appendix H. Questionnaire for the constructs (chapter 5)

Constructs	**Questionnaire Items**	**Source**
Uncertainty avoidance (UA)	UA1. It is important to have instructions spelled out in detail so that I always know what I am expected to do. UA2. It is important to closely follow instructions and procedures. UA3. Rules and regulations are important because they inform me of what is expected of me. UA4. Instructions for operations are important.	(Vance et al., 2008)
Perceived usefulness (PU)	PU1. Using the M-Payment improves my performance. PU2. Using the M-Payment increases my productivity. PU3. Using the M-Payment enhances my effectiveness. PU4. I find the M-Payment to be useful for my work.	(A Bhattacherjee, 2001)
Confirmation (C)	C1. My experience with using M-Payment was better than what I expected. C2. The service level provided by M-Payment was better than what I expected. C3. Overall, most of my expectations from using M-Payment were confirmed.	
Satisfaction (S)	S1. I am very pleased to use the m-payment. S2. I am very happy with the m-payment. S3. I am delighted with the m-payment.	

Continuance Intention (CI)	CI1. I intend to continue using the m-payment rather than discontinue its use. CI2. My intentions are to continue using the m-payment rather than manual processing or other alternative means. CI3. I plan to continue using the m-payment in my job.	

Appendix I. Heterotrait-Monotrait Ratio of correlations (chapter 5)

	C	PU	S	CI	UA
Confirmation (C)					
Perceived usefulness (PU)	0.816				
Satisfaction (S)	0.866	0.749			
Continuance intention (CI)	0.620	0.621	0.570		
Uncertainty avoidance (UA)	0.439	0.443	0.345	0.563	

Appendix J. Cross Loadings (chapter 5)

	Confirmation (C)	Perceived usefulness (PU)	Satisfaction (S)	Continuance intention (CI)	Uncertainty avoidance (UA)
C1	**0.820**	0.544	0.608	0.398	0.300
C2	**0.839**	0.508	0.535	0.387	0.254
C3	**0.787**	0.488	0.504	0.362	0.292
PU1	0.516	**0.767**	0.508	0.369	0.297
PU2	0.548	**0.805**	0.424	0.369	0.243
PU3	0.470	**0.810**	0.486	0.429	0.286
PU4	0.443	**0.755**	0.460	0.364	0.293
S1	0.563	0.523	**0.859**	0.424	0.295
S2	0.566	0.522	**0.858**	0.395	0.205
S3	0.595	0.481	**0.832**	0.358	0.215
CI1	0.388	0.431	0.390	**0.829**	0.445
CI2	0.367	0.385	0.377	**0.815**	0.337
CI3	0.405	0.404	0.411	**0.831**	0.371
UA1	0.330	0.315	0.246	0.428	**0.788**
UA2	0.252	0.304	0.244	0.318	**0.809**
UA3	0.255	0.261	0.209	0.329	**0.807**
UA4	0.251	0.247	0.188	0.370	**0.774**

Book Spine


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Frank Franque
PhD