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Aijaz Ahmed Shaikh

# Examining Consumers' Intention, Behavior, and Beliefs in Mobile Banking Adoption and Continuous Usage

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UNIVERSITY OF JYVÄSKYLÄ

JYVÄSKYLÄ 2016

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## ABSTRACT

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Changing consumer behavior continues to have a profound impact on digital banking adoption and prolonged usage in developed and emerging markets. Several factors influence the consumer decision journey when choosing any specific digital channel or combination of channels. Among a variety of digital banking channels, this dissertation research seeks to contribute to the mobile banking (m-banking) literature by examining consumer behavior in m-banking services as well as technology (application) adoption and continuous usage, especially after considering the fact that financial service institutions have entered a time when offering mobile-based services is no longer a novelty but a necessity.

This dissertation analyzes and synthesizes a plethora of literature on information systems/information technology and m-banking and their adoption and usage across various strata of populations in developed and emerging countries. The dissertation provides useful insights into the drivers of adoption and continuous usage of m-banking services and application.

The most valuable findings indicate that the m-banking adoption and usage literature is fragmented and lacks a clear road map or agenda. The extant literature appears limited by its narrow focus on SMS banking in developing countries. More surprisingly, no studies address the use of m-banking applications via smartphones or tablets or consider the consequences of such usage. Self-congruence is significantly related to perceived value (PEVA) and addresses a critical gap in the extant literature, which does not seem to have analyzed the effect of self-congruence on m-banking continuous usage. Overall, PEVA is significantly associated with increased m-banking usage, and PEVA is a significant antecedent of the intention to use for consumers in a mature market. On a different note, the main motivation for the continuous usage of m-banking is convenience. The results also indicate positive changes in bank customers' relationship commitment after using m-banking services.

Keywords: mobile banking, consumer behavior, pre-adoption, post-adoption, perceived value, relationship commitment, Finland, South Africa

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Jyväskylä, December 2016
Shaikh, Aijaz A.

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# 1 INTRODUCTION AND MOTIVATION

## 1.1 Research context

The never ending technological developments and the emergence of information, communication, and digital innovations have essentially blurred the difference between traditional and modern consumers. These unprecedented developments intensify the relentless consumer demand for more innovative, more convenient, and always-on products and services, they transform the marketing as well as the customer relationship management landscape, and they create challenges for governments, regulatory authorities, financial institutions, and newly emerging financial technology (FinTech) companies to make the financial services more efficient.

Among the most popular and prominent technological advancements seen in the service industry during the recent past are included electronic service delivery channels, mobile telephony, and social media. These developments have seen banking and other financial institutions embrace a multichannel strategy for their customers, aiming to elevate customer satisfaction and increase business. These technological advancements, in addition to outsourcing strategies encouraging cross-industry collaborations, have also radically changed the way banking companies, microfinance institutions, and other financial organizations operate and have spurred the financial houses to fundamentally rethink their growth strategies.

Considering these advancements, several electronic and Internet-based channels and applications have been introduced by the banking industry since the early 1990s as part of their long-term marketing strategy to foster user mobility (Oulasvirta & Brewster, 2008), achieve a shared goal of understanding and empowering consumers (i.e., consumers can choose how they make and receive payments), increase financial services outreach (i.e., financial inclusion), and manage internal and external banking activities to different consumer segments such as the banked, underbanked, and in a few cases, the unbanked (Shaikh & Karjaluoto, 2016). These diversifying banking services are

increasingly important for banking companies trying to create a competitive advantage in the market, retain their customer base, and cut costs (Laukkanen, 2016). Deloitte (2011) has reported that the cost of processing a transaction via a mobile device can be as much as 10 times lower than via automated teller machines (ATMs) and as much as 50 times lower than via a bank branch (see Figure 1).

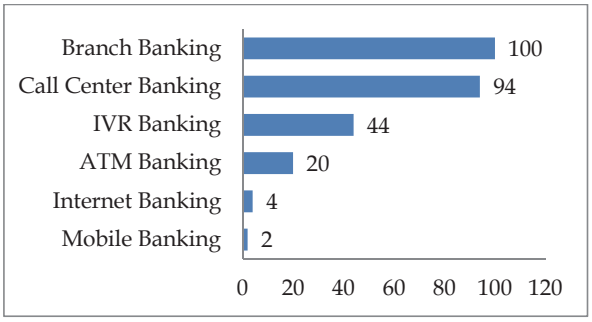


FIGURE 1 Relative transaction cost per alternative delivery channel usage [Source: Deloitte (2011) and modified]

Researchers (e.g., Shaikh & Karjaluoto, 2015a; Shaikh & Karjaluoto, 2016b) have discussed various banking service channels known as alternative (or alternate) delivery channels include ATMs, point-of-sale (POS), telephone, call center, Internet, mobile, and social media. Figure 2 depicts a birds-eye view of retail banking systems including alternative delivery channels.

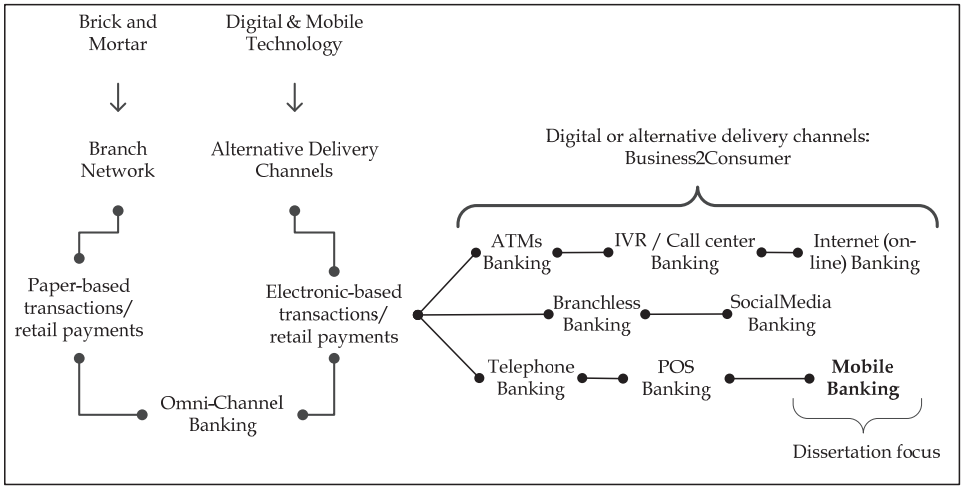


FIGURE 2 Birds-eye view of retail banking system including alternative delivery channels

Some distinction among these channels has been established. For instance, ATMs and POS support and allow different card-based transactions, such as

debit and credit cards. In most of the emerging and developing countries, ATMs appear to be the most preferred banking channel (Shaikh & Shah, 2012). By eliminating location and time barriers, Internet (net) banking facilitate consumers in accessing their financial information remotely, quickly, and conveniently without the need for visiting a bank branch or ATM. Mobile and branchless banking services, added latterly to the digital banking portfolio, have revolutionized the banking services landscape; have increased the outreach of retail banking services to demographically dispersed populations; and have allowed anytime, anywhere, anyhow banking and payment services to consumers on their portable devices—commonly, but not exclusively, cell phones, smartphones, tablets, and wearables—to initiate an electronic transaction.

Among the frequently used delivery channels, m-banking has appeared to be the fastest growing banking channel worldwide (Wonglimpiyarat, 2014). Mobile services and their consumption have recently become a burning issue among scholars (Laukkanen & Kiviniemi, 2010); the m-banking discourse shows a positive trend indicating a broader adoption in the near future, which should encourage both researchers and practitioners to stay involved in the topic (Moser, 2015). Consequently, in my opinion, this is an exciting time to investigate m-banking services, products, and applications, because several innovations are going on in this field.

Being the *de rigueur* buzz term of this and the previous decade, "m-banking" was bound to spawn similar terms and acronyms. For example, the term "m-banking" has interchangeably been used in the literature with "smartphone banking" (Park, Shin, & Lee, 2014), "WAP Banking" (Ratten, 2008), "SMS banking" (Nyeko, Moya, Kabaale, & Odongo, 2014), "m-payments", "m-finance" (Donner & Tellez, 2008), "digital banking" (Olanrewaju, 2014), and so forth. However, throughout this dissertation, I use the compound term "m-banking" to encompass all of the applications, products, and services as well as to refer to the most common features of this type of banking. I also use the terms "innovation" and "technology" as synonyms.

Juniper Research (2013) considers a mobile device to be a handheld mobile unit supporting mobile telephony and mobile data communication. More specifically, this classification includes cell phones, feature phones, smartphones, and tablet devices. Given the interdisciplinary nature of consumer behavior, IS, and banking, Koufaris and Ajit Kambil (2001) have argued that researchers need to combine the research streams of IS, psychology, and marketing to study and understand consumer behavior.

Against this backdrop, the purpose of this dissertation is to offer a historical interpretation of information systems and information technology (IT) (Article 1) in general and of m-banking (Article 2) in particular. In addition, this dissertation contributes to a deeper understanding of two important research streams, namely, the pre-adoption (Article 2) and post-adoption (Articles 1, 3, & 4) of IS/IT and m-banking applications and services at a single level of analysis

(i.e., the individual level). The single-level perspective advanced in this dissertation offers rich opportunities for theoretical and empirical insights and suggests a new foundation for in-depth research on the nature of m-banking adoption and continuous usage, its emergence and change, and its antecedents and consequences (Burton-Jones & Gallivan, 2007).

How consumers and consumer behavior are changing because of an increasing digitization and electrification of products and services is of prime interest. Reasons to study consumer behavior, especially in the context of m-banking adoption and usage, are based on a few important facts. First, there is an inherent uncertainty associated with innovation; that is, when any innovation such as m-banking is developed and offered, it faces resistance, and therefore, only a few people adopt or accept and use it. As a result, understanding consumer acceptance behavior is considered critical, because the expected benefits of continuous usage of an information system such as m-banking cannot be realized if consumers do not accept the innovation in the first place (Bhattacherjee & Sanford, 2006). Second, post-adoption or continuous usage well after initial adoption ensures the success of the innovation; therefore, continuing usage of information systems, including m-banking, has been the subject of important theoretical developments and empirical advances (De Guinea & Markus, 2009).

This dissertation also carries some important implications for theory, and practice, regulators, and policy makers. For instance, this dissertation extends the previous research in different ways by first providing two literature reviews that identify and outline gaps in the extant literature. This dissertation contributes to the theory (see Section 5.1.1) by identifying two major research streams, that is, pre-adoption and the post-adoption of technology, and by providing insights into the drivers of the adoption and continuous usage of m-banking. In addition, this dissertation examines the largely unexplored relationship between self-congruence and the perceived value of using m-banking technology and confirms how perceived value influences consumer usage intentions toward m-banking.

Regarding the practical implications (see Section 5.1.2), by explaining users' intentions from their own perspectives (Luarn & Lin, 2005), this dissertation can not only help m-banking authorities and marketing practitioners develop an m-banking system more accepted by users, but it can also provide insight into the best way to promote the new banking channel to potential users (Shaikh, Karjaluoto, & Chinje, 2015b). For regulators or policy makers, this dissertation will provide an enduring insight into the understanding of consumer behavior when adopting and using digital banking services such as m-banking. This insight will allow regulators and policy makers to draft a regulatory mechanism that will protect the consumer interest and increase access to financial services, anytime and anywhere, that will contribute to overall economic growth.

This dissertation empirically examines various considerations associated with IS in general and m-banking in particular and measures the determinants

of customer interactions (adoption and usage) with IS/IT and m-banking application and services. Especially focusing on the m-banking, this dissertation provides an overview of the historical aspects as well as the current state of m-banking in a developed country (Finland) and an emerging country (South Africa). In addition, it describes how various antecedents and consequences influence the adoption and the continuous usage of m-banking downloadable applications and m-banking services developed and offered by various banking companies.

From the beginning, I had no doubt that m-banking's effects were considerable. However, I had not anticipated some of the valuable findings of my research (see Chapter 4) that have significant implications for research as well as for national, regional, and global banking institutions (see Chapter 5).

This dissertation contains four published articles, all published in co-authorship with my supervisor. However, I am the first and the correspondent author in all the articles.

## 1.2 Research motivation and gaps

Bill Gates was chairman of the world's largest technology firm, Microsoft Corporation, and one of the most successful entrepreneurs of the twentieth and twenty-first centuries. He once predicted that "*in the 21st century, there will be a lot of banking but no banks*." A growing virtualization of banking services will diminish the need for bank branches across the globe, will radically transform banking operations, and will result in the development of a new type of banking products and services that can conveniently be accessed using various channels and devices. Accenture (2010) has predicted positive growth for the adoption of m-banking in emerging and rural markets where traditional financial services are limited. Forrester Research (2014), too, reported that mobile channels will fundamentally change retail banking and will soon become mainstream in both developed and emerging countries. Specifically, m-banking provides the opportunity to reach new and rural markets, creates efficiencies, and allows customers easy access to their financials. Against this backdrop of positive growth in m-banking, understanding evolving consumer digital behaviors and preference criteria in adopting and using mobile financial services will provide valuable research opportunities as well as practical implications.

A few other compelling reasons drove my motivation for this study. For instance, innovation and development in mobile IS and mobile finance has been rapid, mobile devices offer immense convenience, ease of use, connectivity, and an innovative option of anytime, anywhere, any device banking to demographically dispersed consumers (Shaikh, Glavee-Geo, & Karjaluoto, 2015c). These widespread rapid advancements in mobile telecommunication have radically changed people's lives, contributed significantly to economic

growth (Ward & Zheng, 2015), and promoted the usage of mobile devices in banking services.

There is little doubt that m-banking—defined as the execution of banking services and transactions using a mobile device including a cell phone or tablet—has seen extraordinary adoption rates since the earliest and quite limited Short Message Service (SMS) and Wireless Application Protocol (WAP) offerings (KPMG, 2015). Today, almost all banks as well as microfinance institutions (located mostly in the emerging and developing countries) have some kind of m-banking offering. Moreover, in the developed world, the rapid proliferation of smartphones and tablets has profoundly increased the adoption and usage of m-banking applications and services.

Since the advent of cell/smartphones in 2007 and their immense penetration across the globe (already over 4.77 billion or 66% of the global population in 2015 is now using smartphones; eMarketer, 2016), m-banking has developed considerably, and the number of users and the number of transactions have increased at an astounding rate to produce a major channel for bank transactions (Lee, Harindranath, Oh, & Kim, 2015).

Recent analysis (e.g., McKinsey & Company, 2014a) shows that over the next five years, more than two-thirds of banking customers in Europe are likely to be "self-directed" and highly adapted to the online world. Similar evidence has also been shared in other popular market reports. For instance, Forrester Research (2014) estimated that close to 40% of all adults with online access and a bank account use m-banking on either a smartphone or tablet. Juniper Research (2013) predicted that by end 2016, over 1.75 billion mobile phone users will have used their devices for banking purposes, compared to 800 million this year. ING (2015) surveyed over 14,800 consumers in 15 countries and reported that a vast majority (85%) of mobile bankers in Europe list at least one way that m-banking has improved their money management, and 33% of Europeans have already used a mobile payment app, which allows the user to make payments via mobile or tablet. This is expected to increase to 51% over the next 12 months. This means that during the year 2015, as many as 185 million European consumers were moving toward a cashless society, choosing to pay electronically rather than with physical cash.

What is more intriguing, many m-banking users in Europe say the technology helps them feel "more in control" of their finances, and almost a quarter say that compared to m-banking, they now use Internet banking much less often to manage their money. Last but not least, KPMG (2015) reported that the number of mobile users was set to rise from 0.8 billion in 2014 to 1.8 billion by 2019. Mobile appears to be the largest banking channel for the majority of banks by volume of transactions, and m-banking adoption rates are highest in emerging countries—reaching 60–70% in China and India. These market analyses illustrate a precipitous rise in the adoption and usage of mobile bankers using mobile devices and, thereby, shrinking the usage of physical channels such as branch-oriented banking.

Extant financial marketing and information systems and information technology literature has concluded that the use of portable devices in banking services is still in its infancy (Thakur, 2014; Shaikh & Karjaluoto, 2015a); furthermore, a broad acceptance (or pre-adoption) of m-banking still remains low, even within established markets (Moser, 2015). For instance, over 1.5 million people signed up for m-banking services in Taiwan in 2009, but only a fraction (i.e., 2.3%) of banking transactions were realized through m-banking (Kurila, Lazuras, & Ketikidis, 2016). Another study from Germany showed that while Internet use is widely prevalent among consumers, only a small number of Internet users signed up for and used Internet banking services (Röcker & Kaulen, 2014). In Finland, an over 86% adoption rate has been reported for individual online bank usage, but the overall m-banking usage rate is around 11% (Eurostat, 2014; TNS Gallup, 2012). A low penetration of m-banking users in Taiwan, Germany, and Finland is evidence of how much still needs to be done to bring m-banking to a mass audience. In summation, the multimillion investments made in mobile technology and services can hardly pay off unless customers accept and utilize those services effectively (Zhou, Lu, & Wang, 2010).

In line with these reports and predictions, this dissertation sees clear and growing evidence that m-banking applications and services dominate banking, marketing (consumer behavior), and operation strategy and will soon become the most preferred digital banking channel in several countries across the globe. Against this backdrop, I increasingly believe that m-banking adoption as well as its continuous usage is critically significant to the study and identification of the antecedents that influence it and that these therefore require examination (Shaikh et al., 2015c).

Especially with regard to the literature reviews (Articles 1 and 2) conducted and included in this dissertation, to the best of my knowledge, no prior reviews from these perspectives were available. For example, Dahlberg, Mallat, Ondrus, & Zmijewska (2008) conducted a comprehensive literature review on one information system i.e. *m-payment services*, analyzed the various factors that impacted mobile payment service markets, and suggested directions for future research. Ngai and Gunasekaran (2007) reviewed the literature on *m-commerce and applications* using a suitable classification scheme in order to identify the gap between theory and practice, and they suggested future research directions. Similarly, Donner (2008) reviewed around 200 recent studies of *mobile phone* use in the developing world and identified major concentrations of research.

Similarly, a long strand of research (e.g., Laukkanen, 2016; Antioco & Kleijnen, 2010) has recognized that only a few studies have examined the factors inhibiting the adoption and continuous usage process and behavior. Consequently, the barriers consumers perceive between them and innovative services such as mobile and Internet banking require further studies.

## 1.3 Research objectives and scope

The research objectives of this dissertation have been divided between two major domains. The first seeks to examine the factors or antecedents influencing the consumer decision-making process during acceptance or pre-adoption of m-banking technology and services. The second domain examines the consequences influencing the consumer decision-making process during the post-adoption or continuous usage of IS/IT, m-banking technology and services. Specifically, this dissertation has following three major objectives.

### 1.3.1 To identify main theories, frameworks, factors, and consequences used in information systems and m-banking research to predict users' adoption and continuous usage intention and behavior (Articles 1 and 2)

The significance of conducting literature reviews in the domain of mobile and generally in IS/IT adoption and usage has been identified in previous literature (Dahlberg et al., 2008; Sanakulov & Karjaluoto, 2015; Venkatesh, Morris, Davis, & Davis, 2003). Specifically, Venkatesh et al. (2003) identified the need for literature reviews and synthesis in order to progress toward a unified view of user adoption or acceptance.

Literature review occupies an important position in academic research, and their role in advancing knowledge is undeniable. Based on a collection of anecdotes and past experience, Webster and Watson (2002, p.13) explained that an effective literature review creates a firm foundation for advancing knowledge, and it facilitates theory development, identifies areas where a plethora of research exists, and reveals areas where research is needed. Clearly articulating the centrality of literature reviews in the academic research, Creswell (1994, p. 37) suggested that literature reviews should meet three major criteria: to present results of similar studies, to relate the present study to the ongoing dialogue in the literature, and to provide a framework for comparing the results of a study with other studies.

This dissertation seeks to contribute to the m-banking and generally to IS/IT literature by exploring and analyzing the current state of knowledge on m-banking, IS, and its adoption and usage across various strata of populations (see Articles 1 and 2).

### 1.3.2 To examine how self-congruence and perceived risk affect the perceived value of m-banking application use and how perceived value affects continuous usage intention and positive word-of-mouth (Article 3)

Since the early 1960s, many adoption behavior models, theories, and frameworks were developed in the IS research disciplines that considered technological, cultural, environmental, and organizational factors as important predictors of individual technology adoption (Al-Mamary et al., 2015). This

dissertation theoretically proposes and empirically tests a theoretical model consisting of a set of variables that could influence an individual's intention to use m-banking technology (Article 3). An empirical test of a self-developed theoretical model on the original data collected using a survey instrument provides valuable information to determine how to effectively increase m-banking usage for an extended time period. This dissertation also considers "adoption intention" and "continuous usage intention" as key dependent variables, empirically examining their determinants to provide a comprehensive insight into the deciding factors affecting continuous usage of m-banking in a developed country.

### 1.3.3 To examine experienced m-banking users' relationship commitment to their banks (Article 4)

This dissertation aims to investigate continuous usage behavior in a multi-country context i.e. Finland and South Africa by way of examining various significant post-adoption behavioral consequences—namely, trust, satisfaction, word of mouth (WOM), relationship commitment, and so forth. There is a growing need for research on how m-banking may be changing customer relationship commitment to a banking institute as a result of less direct human interaction with the bank (Shaikh, Karjaluoto, & Chinje, 2015a). Examination of these consequences in a dual-country assessment will provide valuable insights into the dynamics of m-banking post-adoption consequences (Shaikh et al. 2015a).

### 1.3.4 Scope of the dissertation

Research and the industry have considered m-banking and Internet banking as two separate research streams, having their own business models, environment, technologies, and devices. This led me to understand that m-banking maintains its own flavor and that any future research in this regard may produce valuable findings for scholarship, industry, and regulators.

Concerning the scope, this dissertation focuses on retail digital banking services, focusing on individuals or end users, and therefore, wholesale or corporate banking as well as the organizational and technological factors that influence the level of adoption and usage are out of the scope of the dissertation.

To ensure that an examination of bank delivery channels is manageable, it is therefore not unusual to limit the range of digital bank channels under examination (Howcroft, Hamilton, & Hewer, 2002). The scope of this dissertation, accordingly, concentrates on m-banking channel. An overview of other delivery channels, however, is provided in later chapters for the benefit of the research.

Confusion surrounds the distinction among the roles played by various organizations developing, deploying, and offering mobile-based financial services. These organizations include commercial banks, credit unions,

microfinance banks and institutions, telecom companies, FinTech firms, and third-party developers. The scope of this dissertation, however, is limited to investigating consumer behavior in adopting and using m-banking offered by commercial banks. Hence, strategic or management issues, m-banking security, and crime implications concerning the development or deployment of m-banking are beyond the scope of this dissertation.

## 1.4 Research questions and a brief description on how the individual articles (included in this dissertation) build on each other

Researchers have viewed research questions in empirical studies as a crucial early step that provides a point of orientation for an investigation (Bryman, 2007). On the basis of the research objectives and scope discussed in subsection 1.3, the research questions that resulted are introduced in this section.

This articles-based dissertation consists of four scholarly papers (including three journal papers and once conference proceedings). The research objectives were evaluated in the light of four identified and framed workable research questions (and four sub-research questions) that are the backbone of this dissertation research (see Table 1).

TABLE 1 Research questions

| Main Research Question | Sub-research Question | Target Article |
|---|---|---|
| **RQ1:** What are the main theoretical frameworks in IS/IT research used to predict users' continuous usage intention and behavior? | ***RQ1.1.*** In what directions should research go in order to create a more in-depth understanding of the drivers of continuous usage intention? | Article 1 (Literature review) |
| **RQ2:** In the light of the literature, what are the factors and relative strengths of the main theories used to predict the adoption of mobile banking? | ***RQ2.1.*** In what directions should research go in order to create a more in-depth understanding of the drivers of m-banking adoption behavior? | Article 2 (Literature review) |
| **RQ3:** How does the perceived value of m-banking application use affect continuous usage and positive word of mouth? | ***RQ3.1.*** How do self-congruence and perceived risk affect perceived value?<br>***RQ3.2.*** How does the frequency of using an m-banking application and experience affect continuous usage? | Article 3 (Survey) |
| **RQ4:** What kind of meanings do experienced m-banking application users give to their m-banking use in the light of their customer relationship development with their banks? | --- | Article 4 (Interview) |

It is widely accepted that when a new innovative service such as m-banking is introduced, some users feel fearful about using it for banking transactions (Lin, 2011). Consequently, attracting potential customers to a newly introduced service and retaining existing customers are crucial to the long-term business success of firms offering m-banking applications and services (Gu, Lee, & Suh, 2009). I believe that a deeper understanding of the factors affecting user intention in accepting m-banking applications and services is indispensable to the survival and development of this delivery channel. Although the potential growth and acceptability as well as the benefits of m-banking have been widely reported, for these predictions to materialize, both the adoption of m-banking services and their continuous usage are paramount (Pavlou & Fygenson, 2006).

Under these circumstances, two detailed literature reviews were conducted in the broader area of IS/IT usage and m-banking acceptance. These articles contribute to the discussion of IS/IT usage and especially the discussion of m-banking acceptance.

To address RQ1 and RQ2, two literature review (Article 1 & 2) was conducted to understand the post-adoption and pre-adoption phenomenon and to contribute to a better practical and theoretical understanding of the consequences that drive consumer behavioral intention toward embracing and using information systems, information technologies and m-banking in particular (Shaikh & Karjaluoto, 2015a).

From the m-banking application perspective, Article 3, which addresses RQ3, develops and tests a model of continuous usage intentions of m-banking applications in Finland.

Finally, Article 4 addresses RQ4 and presents a multi-country analysis of the antecedents impacting consumer m-banking service usage in a developed (Finland) and in an emerging (South Africa) country (RQ4).

The four published articles included in this dissertation are interrelated with each other and largely discuss one phenomenon, that is, m-banking in the context of pre-adoption and post adoption. Figure 3 depicts the way in which research gaps were found in the post-adoption or continuous usage stream, and as a result, Articles 3 and 4 were derived from Article 1. Here, Article 1 identified and suggested four major domains in the information technology and systems literature. Among these four domains, domain 1, entitled "continuous usage of mobile information systems," forms the basis of this dissertation work. Article 2 was published in the pre-adoption or acceptance research stream with an underlying objective of exploring and analyzing the plethora of contemporary and historical studies on m-banking and of unifying and synthesizing disparate streams of research on m-banking pre-adoption into a more coherent body of knowledge.

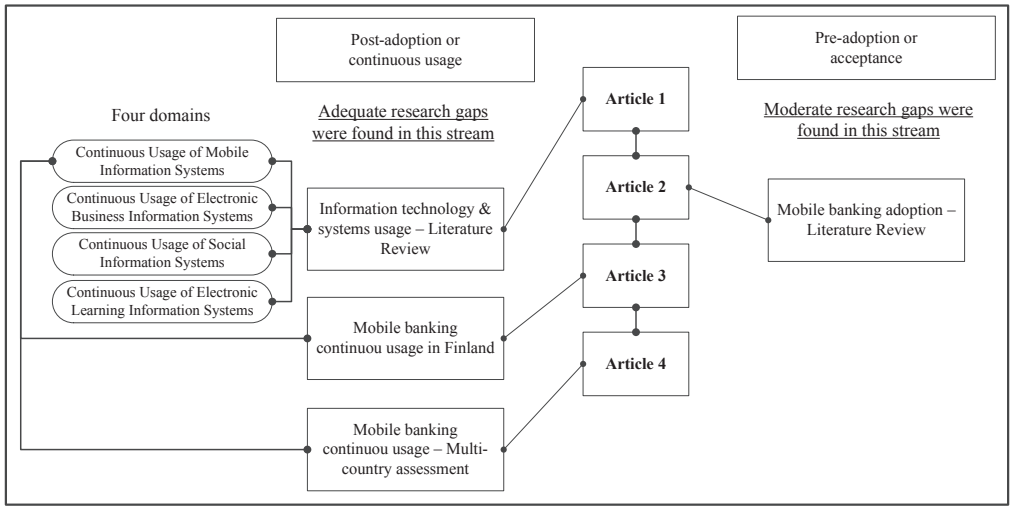


FIGURE 3 How individual articles are built on each other

## 1.5 Research design

A research design is a road map or a work plan for conducting a research project. It is used to develop various types of theories, and it is widely considered a vital element in any empirical research project that is used as a guide in collecting and analyzing data (Grunow, 1995).

Although different types of theoretical designs may be appropriate for a given research problem, two major research designs dominate the literature: exploratory and conclusive. A conclusive research design can be either descriptive or causal.

Exploratory research is a type of research design in which the major focus is on gaining insights and discovering new ideas or hypotheses that help to identify business or social problems. In an exploratory research design, the data or information gathering is largely informal and unstructured (Malhotra, 2002) and can involve either primary or secondary data. Examples of projects that use exploratory research include literature reviews or meta-analyses, qualitative studies based on in-depth structured, semi-structured, or unstructured interviews, and focus groups. Exploratory research design is not limited to one specific type but may use either qualitative, quantitative, or mixed methods, especially after considering the sample size. According to Creswell and Clark (2007), the preferable purposefully selected sample size for a qualitative project will be smaller than the randomly selected sample size for a quantitative study.

A conclusive research design, which can also include descriptive or causal types, assists the scholarship, the policy, and the decision maker in determining, evaluating, and selecting the best course of action for a given time (Malhotra, 2002, p. 85). The purpose of this research is to establish a clear description of the

phenomena under investigation. The underlying purpose is to classify events so that later research can employ unequivocal terminology and lessen the confusion coming from *ad hoc* definitions (Carpenter, 1954, p. 150). Examples of research that employs a conclusive design include longitudinal and cross-sectional studies, as well as field and laboratory experiments.

This dissertation consists of four scholarly published papers that approach the examined i.e. m-banking from different perspectives (pre-adoption and post-adoption) and in different demographic locations (developed and emerging markets). In Articles 1 and 2, systematic as well as detailed overviews of the historical and contemporary research on information technology & systems in general and of m-banking in particular are presented using secondary and mostly non-numeric sources.

There are several reasons behind the undertaking and inclusion of the literature review articles (1 and 2) in this dissertation. First, the literature has discussed several advantages in considering secondary data such as savings, data quality, and availability (Heaton, 2003), and the importance of using secondary data for analysis purposes has been established in prior research (Smith, 2008).

Second, literature reviews provide an opportunity to review the collective intelligence that has been accumulated from an eclectic body of research that uses various samples, methods, and theories (Shaikh & Karjaluoto, 2015a). This effort is particularly important when the findings of isolated empirical studies contradict one another (Hanafizadeh, Behboudi, Koshksaray, & Tabar, 2014).

Thirds, these two literature reviews aim to contribute to a better practical and theoretical understanding of the consequences that drive human behavioral intention toward embracing and using IS including m-banking (Shaikh & Karjaluoto, 2015b). In summation, these studies will significantly contribute to the IS and m-banking literature by exploring and analyzing the current state of knowledge, including where excess research exists and where new research is needed, and by providing a solid theoretical foundation for the proposed field of studies (Shaikh & Karjaluoto, 2015b; Levy & Ellis, 2006).

In Article 3, a model of continuous usage intentions of m-banking application in Finland was developed and tested. The survey data used to test the study's hypotheses were collected from a sample of 273 Finnish m-banking users. As in the previous study, the participants in this study were experienced m-banking users who had engaged in m-banking for at least six months.

Lastly, Article 4 examines the m-banking services usage in two different countries, Finland and South Africa. A total of 36 in-depth interviews were conducted with experienced m-banking users in the cities of Jyväskylä in Finland and Johannesburg in South Africa.

## 1.6 A note on terminology

The adoption and large-scale usage of the Internet, communication technologies, and delivery channels have radically transformed the working and business models in various financial and nonfinancial organizations of different sizes and business volume. A fundamental challenge in digital banking literature, however, is the lack of common definitions and terms used to describe the host of banking channels such as m-banking. Unlike financial accounting and other long-established business fields (Gibson, Hanna, Defee, & Chen, 2013), there is not yet a universally accepted set of definitions and rules that drive m-banking. This section provides the popular definitions of essential m-banking terms and other key words used throughout this dissertation, including "alternative delivery channels" and "mobile marketing."

Several studies (e.g., Venkatesh et al., 2003; Davis, 1989; Karahanna, Straub, & Chervany, 1999) have considered IS pre-adoption or acceptance and post-adoption or continuous usage as the most mature and defined research areas in the IS literature, influenced by the authors' own beliefs about the decision-making process of the consumers in the intention to adopt and use an information system such as m-banking. Considering the two research streams, this dissertation uses the terms "acceptance," "adoption," "pre-adoption" interchangeably and also uses the terms "post-adoption," "continuous use," "continuous usage," and "usage" interchangeably. Karahanna et al. (1999) argue that a distinction between pre-adoption and post-adoption is crucial in understanding consumers' beliefs and attitudes as well as in analyzing the successful implementation of an IS.

This dissertation considers m-banking as a digital delivery channel that provides bank customers access to banking information that helps to facilitate various financial and nonfinancial transactions using a mobile telecommunication device such as a cell phone, smartphone, or tablet (Shaikh & Karjaluoto, 2016a). Here, the scope of m-banking, as is evident from some scholarly papers (e.g., Shaikh & Karjaluoto, 2015a), includes both financial and nonfinancial transitions. The research on m-banking has considered m-banking applications and m-banking services as two investigative realms (e.g., Alafeef, Singh, & Ahmad, 2011; Shaikh et al., 2015a), and the choice of the mobile devices used for accessing m-banking services has been explicitly limited to cell phones, smartphones, and tablets (Shaikh & Karjaluoto, 2015a).

Alternative (or alternate) delivery channels, also known as electronic banking channels, were developed primarily for two reasons: first, the increasing adoption and usage of Internet-based online services seen in service sectors such as banking and finance, and second, an ambition to reach full global financial inclusion. In this dissertation, the delivery channels are defined as those electronic channels that expand the reach of banking and other financial services beyond the traditional branch-oriented channel and have

emerged as a result of innovations in information and communication technology and a shift in consumer expectations (IFC, 2014).

According to Howcroft et al. (2002), a distribution system consists of a network of people, institutions, service providers, or agencies involved in the flow of a product or service to a consumer, together with the informational, financial, marketing, promotional, and other services associated with making the product or service convenient and attractive to access, use, buy, and rebuy. This definition, therefore, makes it clear that in addition to having an electronic delivery role, delivery channels within the financial services sector also have a marketing role that is fairly important to this sector. For banking companies, delivery channels have helped to extensively improve access to banking products and services, increasing the consumer base and reducing the operational cost. Thus, banking companies do not need to incur high costs for building and maintaining branch networks and training personnel. For microfinance institutions, in addition to significant cost reduction, delivery channels, especially mobiles and ATMs, expand the outreach of financial services to areas in which the traditional branch approach is ineffective, and they also increase product diversification by making savings and remittance products convenient, efficient, and profitable (Bank for International Settlement (BIS), 2010). On the client side, as argued by the BIS (2010), delivery channels provide unprecedented convenience, for instance, through remote payments.

The term "emerging country" has occasionally been misused. However, for the benefit of the scholarship, I have considered the definition of emerging markets as proposed by Hoskisson, Eden, Lau, & Wright (2000) and Karjaluoto et al. (2016, in press). Here emerging markets are generally considered to be lower-income but rapid-growth countries that are using economic liberalization as their primary engine of growth. These countries fall into two major groups, developing countries in Asia, Latin America, Africa, and the Middle East and transition economies in the former Soviet Union, South Africa, and China.

Consequent to the exploding popularity of social media and a growing investment and usage of mobile and communication technologies in several industries including service and manufacturing, the term "marketing" is losing its effectiveness, and therefore, it has hardly been used in the industry or the literature. However, given the seamless usage of several automated tools and techniques in the everyday life of the consumer and these tools' usage in almost every facet of business processes, the term "marketing" is now used synonymously with "digital marketing," "mobile marketing," "online marketing," "electronic marketing," "Internet marketing," "virtual marketing," "interactive marketing," "database marketing," "one-to-one marketing," and so forth. All these innovative terms refer to a set of procedures adopted to bring an idea, a product (including content), or a service to the market for consumers or entities that buy products and services and supply revenue. These markets include physically intangible virtual/e-commerce websites as well as physically tangible markets or retail outlets.

In this dissertation, the term "digital marketing" is defined as a management activity performed using innovative and online digital channels with the underlying goal of meeting and satisfying growing consumer needs in the digital environment and of achieving organization-wide goals and earning profit (Rowley, 2008). After all, the fundamental process in marketing (including digital marketing) is consumption, and the elementary concepts in consumption are satisfaction, value, and utility (Achrol & Kotler, 2012). Earlier, Li, Li, He, Ward, and Davies (2011) argued that digital marketing can employ a wide range of other digital channels such as mobile phones, wireless communications, and digital TV.

The service sector has overtaken the manufacturing sector in profit and business volume. For instance, in most of the developed countries, the service sector represents over 70% of GDP, and that number is growing rapidly (McKinsey & Company, 2014c). The banking sector, which constitutes the largest portion of the service sector, especially after the deregulation in financial markets during the early 1990s, has recorded impressive growth. This promising growth in the service sector has intensified the need for services marketing. For the sake of this dissertation, I use the term "financial marketing" and define it as the marketing of banking and financial services.

Prior research has adopted diverse conceptual, theoretical, and analytic approaches and has employed various empirical methodologies at multiple levels of analysis (Melville, Kraemer, & Gurbaxani, 2004) to understand and analyze the term "perceived value". This term is defined as the customer's objective assessment of the utility of a brand based on perceptions of what is given up for what is received (Zeithaml, 1988).

Although prior research has defined and treated "perceived value" as one of the post-adoption antecedents in IS and marketing research, according to popular opinion, the value expectations exist before a consumer experiences the usage of a product or service. The reason is that the customer will value a product or service only if the customer perceives the need for it (Rust et al., 2000). This consumer need phenomenon includes both utilitarian and hedonic components.

A detailed analysis of the "value proposition" reveals many interesting findings, a few of which will be discussed here. Scholarship has used the term "value" to understand what the company offers in a product or service and what the consumer wants in a product or service. According to Rust et al. (2000), customers normally define value in one of four ways: (1) as a price; (2) as what a consumer wants in a product or service; (3) as the quality one receives for the price one pays; and (4) as what one receives for what one gives up, including time and effort. Consequently, two components, that is, quality and price, dominate the perceived value of a product or service. Prior research (e.g., Zeithaml, 1988; Sweeney & Soutar, 2001) has argued that sometimes consumers perceive value when there is a low price, while others perceive value when there is a balance between quality and price. Additionally, some consumers

obtain value from all relevant "get" and "give" components, leading to Zeithaml's definition of perceived value.

## 1.7 Outline of the study

This dissertation has been organized into different parts and chapters. The two major parts of this dissertation consist of the dissertation and the four original articles. These four articles include three journal articles and one full-length conference paper.

The first chapter provides a detailed introduction as well as the motivation for the dissertation. Research gaps, research objectives, and research scope are included and discussed in the first chapter under separate subheadings. The research questions and the research design are also included and discussed in detail. Finally, a brief note on the terminology used in this dissertation is included.

The second chapter provides the theoretical foundation and is structured along several themes divided among different sections and subsections. For instance, the subsections discuss the dynamism of consumer behavior in the digital era followed by a discussion on digital channels and m-banking. One of the subsections also discusses how m-banking is different from Internet banking and branchless banking. Subsequently, the country profile in respect of banking technology developments where this dissertation work is carried out (i.e., Finland and South Africa) is presented. The remaining sections present the antecedents and the consequences of m-banking adoption and usage. Finally, a discussion on the implications of m-banking for the consumers, for the industry, and for regulators is included.

The third chapter discusses the research methodology and, more specifically, the research philosophy and approach used in this dissertation. A philosophical perspective on two major research types (i.e., qualitative and quantitative research strategies) is presented. The sampling method and data collection strategies used to collect both primary and secondary data are also included and discussed in this section.

A summary of the results of each article included in this dissertation is discussed in chapter 4. Finally, the dissertation's implications and limitations and future research directions are discussed in chapter 5. Here, the implications of the study are divided among three subsections: (1) implications for theory, (2) implications for practice, and (3) implications for the Finnish business environment.

# 2 LITERATURE REVIEW

This chapter provides a detailed review of the published literature, in the context of consumer behavior and m-banking technology and services, that grounds this dissertation research. This chapter explains the basis for and contribution of this research project. Consequently, the underlying objective is not to discuss and report what has been examined and analyzed before but to provide a creative organization of historical and contemporary work that helps to frame and build the arguments supporting the phenomena in question. This chapter is structured along several themes divided among different sections. The author first provides a detailed account of consumer behavior and its evolution in the digital or information age (Section 2.1). The next section defines m-banking and other alternative delivery channels and differentiates between m-banking and Internet banking and also between m-banking and branchless banking (Section 2.2). Subsequently, the author presents the country profiles in respect of banking technology developments where this dissertation work is carried out, that is, Finland and South Africa (Section 2.3). The remaining sections discuss the m-Banking fundamentals including the research models, and frameworks used (Section 2.4).

## 2.1 The dynamism of consumer behavior in this digital age of information

The past 50 years have witnessed an explosion in academic research about consumers, and a majority of these studies have yielded substantial knowledge about consumer choice, attitude and satisfaction judgments, consumption meanings, consumer brand relationships, and more (MacInnis & Folkes, 2010). Prominent and frequently cited studies include "Consumer switching behavior in the Asian banking market" (Gerrard & Barton Cunningham, 2004); "Consumer financial literacy and the impact of online banking on the financial behavior of lower-income bank customers" (Servon & Kaestner, 2008); "The

disciplinary status of consumer behavior: A sociology of science perspective on key controversies" (MacInnis & Folkes, 2010); "Consumer behavior in online game communities: A motivational factor perspective" (Hsu & Lu, 2007); "Is consumer behavior different?" (Folkes, 2002); "Factors influencing the adoption behavior of m-banking: A South Korean perspective" (Lee, Lee, & Kim, 2007); and "Modeling online consumer behavior: Preeminence of emotions and moderating influences of need for cognition and optimal stimulation level" (Richard & Chebat, 2016).

These studies articulate the core of the authors' intellectual domain regarding consumer behavior, and they provide some intriguing findings, so a few of these will be discussed here. According to MacInnis and Folkes (2010), consumer behavior is not an independent discipline but is a subdiscipline of marketing. The core of the consumer behavior field is characterized by the study of people operating in a consumer role, which usually involves the adoption, acquisition, usage or consumption, and disposition of marketplace products, services, ideas, and experiences. Consumer behavior has not become an interdisciplinary field but instead is best described as multidisciplinary. Differentiating the concept of "consumer behavior" from "general human behavior," Folkes (2002) argues that these two concepts are different, since consumer behavior engenders unique interpersonal (or exchange) relationships that influence the power balance between buyers and sellers. Unlike general human behavior, consumer behavior involves unique contextual features such as the proliferation of mass media persuasive messages; consumer behavior also entails domain-specific topics such as materialism.

With the exception of information technology, there is probably no other discipline that has evolved so quickly. An extensive usage of IS in various organizations including banks has witnessed the emergence of digital banking as a viable banking system. Without doubt, these banking developments and innovations have had a profound and lasting effect on the way in which banking customers interact with the banks that they serve, and consequently, these innovations have exerted a greater influence on consumer purchase and continuous usage behavior.

The author started with a caveat that prior to these developments, in the physical commercial world, information technology usage for operations remained mostly in the background, invisible to the end-user or consumer. But in the e-commerce and mobile-commerce age, the technology has been moved to the foreground and has become the store itself as a website (Koufaris, 2002). These disparate but seemingly legitimized advancements, seen especially in the banking and finance field, have caused customers to change their attitude and behavior toward banking services and the way those services are being offered and promoted by their mainstream financial institutions and are accessed by them. For instance, a major shift in consumer financial behavior has been noticed when the consumer is accessing banking information and conducting transactions; most such bank consumers prefer not to visit their banks and choose instead to bank online, remotely, in the convenience of their offices or

homes. After the advent and usage of mobile technologies, the need for bank branches has further diminished, and now consumers conduct a host of transactions such as fund transfers, utility bill payments, tuition fee payments, and online shopping using cell phones and tablets anytime, anywhere, and anyhow. This shift in customer behavior is generally considered a rare opportunity as well as a potential threat for retail banking institutions.

Considering that customers are increasingly mobile and even more demanding (Ernst & Young, 2010), the examination of consumer behavior using various theories, techniques, and methods has started to occupy an important position in scholarly and market research. Therefore, an extensive body of research (e.g., Metawa & Almossawi, 1998; Narwal & Sachdeva, 2013) consider it imperative to study the changing behavior, attitudes, and perceptions of bank customers, especially in the retail sector, which constitutes the major portion of the banking and finance business.

The widely used consumer behavior theories include the theory of reasoned action (TRA) developed and popularized by Fishbein and Ajzen (1975) and the technology acceptance model (TAM) developed and popularized by Davis (1989), along with its modifications. (For a complete list of theories, models, and frameworks developed over the last seven decades; see Figure 5, Section 2.4.1) These theories show that the belief–attitude–intention causal chain can predict consumer behavior (Hsu & Lu, 2007). TRA has received considerable and, for the most part, justifiable attention in the social psychology field to explain and understand consumer intentions and behavior. Here the consumer's behavior is predicted by intentions, and intentions are jointly determined by the consumer attitude and subjective norms concerning the behavior (Hsu & Lu, 2007). One of the major limitations to this model is that TRA was explicitly designed to study the behavior intention and not the goal intention. In this connection, Sheppard, Hartwick, and Warshaw (1988) explained that TRA deals with a variety of consumer behaviors such as shopping and applying for a loan, but it does not deal with the outcomes and events that result from the behavior, such as obtaining a consumer loan or owning a car. After the TRA was developed and used in 1975, Ajzen (1985) developed an extension to the TRA model and proposed the theory of planned behavior (TPB) by incorporating perceived behavioral control as an antecedent to behavioral intentions (Madden, Ellen, & Ajzen, 1992). Initially using the cost-benefit paradigm and self-efficacy theory, Davis (1989) proposed two influential beliefs, perceived usefulness (PU) and perceived ease of use (PE), in his much publicized TAM. Since its inception in 1989, TAM has been used in a variety of disciplines including marketing, management, and IS.

## 2.2 Emerging technology trends in retail banking and alternative delivery channels

Banking is an integral component of the service industry, offering various services and products to consumer segments in different demographic locations. Consumers access and use their banking information remotely for a variety of purposes, and a few prefer to visit the bank branches and conduct transactions using paper instruments such as checks and demand drafts. Consequently, an access point remained the center of attention for banks and other financial institutions, including microfinance, when implementing transformations as well as when developing, offering, and deploying various banking products, services, channels, and technologies. As a foundation to a discussion on alternative delivery channels, it is important to clearly distinguish between the channel and the technology.

As explained by IFC (2014) in one of its handbooks entitled "Alternative Delivery Channels and Technology," a channel is a customer's access point to a financial service or bank account. Here customers can access financial services at a bank branch, considered a traditional channel. With the advancement of technology, the term "Alternative Delivery Channels" denotes a broader range of options through which a customer can now access financial and banking services without visiting a branch.

Researchers (e.g., Tam & Oliveira, 2016) have divided the channels and the technology into three major categories, from a focus on local-centric (such as physical branches and ATMs) to place-centric (such as Internet banking) and then to equipment-centric (those accessible anytime, anywhere, anyhow). Among these three major categories, the equipment-centric vision brings the customer closer to the bank, since under this access criterion, a consumer needs only a mobile device to carry out a financial and in some cases nonfinancial service. As argued by Tam and Oliveira (2016), in local-centric banking, account holders need to visit a branch or ATM, which may not be close to them. In place-centric banking, account holders can conveniently access their banking information remotely and conduct majority of banking transactions remotely, provided that they have a computer or laptop with Internet access. Table 2 provides a detailed description of branch banking and delivery channels and how these banking channels are categorized, considering their nature, capabilities, and functionalities.

As observed by McKinsey and Company (2014a), delivery channels consisting of various innovative banking channels that expand the reach of services beyond the traditional bank branch network have emerged as a result of innovations in information and communication technology and a shift in consumer expectations. Prior research (e.g., Shaikh & Karjaluoto, 2015a; Laukkanen & Lauronen, 2005; Karjaluoto, 2002a; Karjaluoto, Mattila, & Pento, 2002; Howcroft, et al., 2002) has established that the most consumer-valued aspects of delivery channels are lower fees, better service quality, 24/7/365

TABLE 2 Scope and coverage of branch-oriented banking and alternative delivery channels [Sources: Shaikh & Karjaluoto, 2015a; Shaikh & Karjaluoto, 2016; Gupta, Rao, & Upadhyaya, 2009]

| Description of services | Branch Banking | ATM Banking | Tele (Telephone) Banking | POS (Merchant) Banking | Internet (Net) Banking | Mobile Banking | Branchless Banking | Social Network Banking |
|---|---|---|---|---|---|---|---|---|
| **Types of services** | | | | | | | | |
| Financial | √ | √ | √ | √ | √ | √ | √ | – |
| Nonfinancial (informative) | √ | √ | √ | – | √ | √ | √ | √ |
| **Consumer base** | | | | | | | | |
| Bank account holder | √ | √ | √ | √ | √ | √ | √ | √ |
| Nonbank account holder | – | – | – | – | – | – | √ | √ |
| **Service ranking** | | | | | | | | |
| Convenience | – | √ | √ | √ | √ | √ | √ | √ |
| Accessibility | – | √ | √ | √ | √ | √ | √ | √ |
| Ease of use | – | √ | √ | √ | √ | √ | √ | √ |
| Expensiveness | √ | √ | √ | √ | √ | – | – | – |
| **Security concern** | | | | | | | | |
| High | – | – | – | √ | √ | – | – | – |
| Medium | – | √ | – | – | – | √ | – | – |
| Low | √ | – | √ | – | – | – | √ | – |
| **Outreach** | | | | | | | | |
| Banked | √ | √ | √ | √ | √ | √ | √ | √ |
| Underbanked | – | √ | √ | √ | √ | √ | √ | √ |
| Unbanked | – | – | √ | – | – | √ | √ | √ |

service availability, time savings, location-free access to the services, ease of use, the speed of the service delivery, convenience, compatibility with lifestyle and device, security, perceived usefulness, and attitude.

Historically, there has been wide agreement that soon after the advent of digital/mobile technology and e-commerce applications, banking companies, among all industries, were foremost and swift in adopting and offering Internet, innovative technologies, and mobile telephony. These investments were primarily focused on:

- Meeting evolving consumer demands by reaching out to existing customers and trying to attract new prospective customers through mobile-enabled sales and marketing prowess (Oliveira, Faria, Thomas, & Popovič, 2014).
- Providing faster and more efficient transaction speed, low handling fees, and increased information transparency to consumers (Lee, 2009), and
- Ensuring innumerable service innovations for consumers to create a competitive advantage in the market and expand the customer base (Laukkanen, 2016).

The banks' innovations further delivered immense convenience, interactivity, accuracy, and real-time information to consumers (Chaouali, Yahia, & Souiden, 2016), produced considerable time savings, and noticeably cut down on waiting times and customer queues at bank branches (Tam & Oliveira, 2016). They improved operations, generated additional sources of revenue, and expanded the outreach of financial services (Shaikh et al. 2015b), offering ease of use, superior and always-on connectivity, and an innovative option of anytime, anywhere, anyhow banking (Shaikh & Karjaluoto, 2015b). They reduced operational costs and improved service quality by offering more convenient access and reduced costs to the end-consumer (McKinsey & Company, 2014b), ensuring time and location independence as well as securing transactions through the use of personal mobile phones to identify account owners and confirm transactions (Lee et al. 2015).

These immense benefits, along with an increasing portfolio of banking and financial services, a radical shift in the linear customer funnel approach, and a widely dispersed consumer market that spread over several demographic locations, produced the need to develop an innovative, highly convenient, and easy to use multichannel. This became the center of attention of many banking companies, microfinance institutions, and nonfinancial firms, including telecom companies, over the last couple of decades. This necessity led to the development of various alternative (or alternate) delivery channels meant to leverage the bank branches to acquire new customers, retain existing customers, and provide a superior customer experience. One of the banking institutions' underlying assumptions and first insights into developing delivery channels may have been that inconsistencies across banking operations and at various bank branches were creating snags and increasing operational cost and risk.

## 2.3 Major banking technology developments in Finland and South Africa

Finland, one of the founding members of the Europe Union and an important part of the Nordic region, has developed an amazing infrastructure, a highly developed payment system, a knowledge economy, an information society, and a few of the most successful and innovative entrepreneurs (e.g., Nokia, Angry Birds).

With regard to the emergence and rise of digital in Finland, the Nordic Mobile Telephony (NMT) standard established in the early 1980s by the telecommunication administrations in Sweden, Norway, Finland, and Denmark was considered a rebirth of information and telecommunication technology in the Nordic countries (Sadowski, Dittrich, & Duysters, 2003). Later in 1981, the Nordic Public Telephone Operators (PTOs) developed the Nordic Mobile Telephone system (NMT) as a standard for automotive mobile telephones. Although the NMT standard was initiated and developed by Ericsson and the Swedish PTO, it was later adopted and codeveloped by Nokia in Finland (Lehenkari & Miettinen, 2002). These advancements in mobile telecommunication radically changed people's lives, contributed significantly to economic growth (Ward & Zheng, 2015), and promoted the usage of mobile devices in banking services.

All these developments seen in the banking sector were, however, further inspired after the financial sector reforms and the liberalization of financial institutions and markets in Finland, which began gradually in the 1980s but picked up speed in the 1990s (Peltoniemi, 2007). There is wide agreement that these financial sector reform programs instituted in Finland diverted the location-specific retail payment services in Finland toward more innovative and self-service methods. For instance, according to the Bank of Finland (2000), in respect of the use of different retail payment methods, the 1990s constituted a decade of major change in Finland. A prevailing trend was the electronification of retail payment methods, and the traditional methods based on personal over-the-counter service were replaced by new methods based on the principles of self-service and electronic forms of transferring data. These developments also initiated a culture where interaction and interdependence with other market participants were considered crucial and were widely considered the first steps toward making paper-based information transmission in Finland virtually obsolete. Other developments seen in the digital banking arena are discussed below.

Phone-based home banking services emerged in Finland in 1982 (Bank of Finland, 2000). Personal computer (PC) banking based on home PCs and modems has been available in Finland since early 1984 (Bank of Finland, 2000). ATM banking services have been available in Finland since 1989, followed by e-money services, which have been available since 1993 (Bank of Finland, 2000). One of the notable developments occurred when the four biggest banks in

Finland established a jointly owned company in 1994 to take care of the services provided by ATMs (Holstius & Kaynak, 1995). These developments allowed the cardholder of any bank to access and use ATM machines anywhere in the country and execute both inter- and intrabank transactions.

Internet-based banking services started in Finland in 1996. According to Karjaluoto (2002b), a radical shift in the consumer attitude toward accessing and using banking information was noticed in Finland when consumers started using personal computers in private banking during 1996. Here the emergence of the Internet in Finland had a significant impact on the diffusion and large-scale adoption and usage of electronic or net banking (Karjaluoto, 2002b) as a faster and cheaper delivery method. It is worth noting that on a global level, the first Internet-based virtual banking services were started in Finland (Suoranta, 2003). In addition to Internet banking services, the technological developments in payment services including mobile phone–based banking applications were also initiated in 1996 in Finland (Bank of Finland, 2000). These services, which were earlier SMS-based, were transformed to the next generation of WAP phone banking, which also started in Finland in 1999 (Bank of Finland, 2010). According to Laukkanen and Lauronen (2005), the first m-banking application in Finland was developed and offered by Merita Nordbanken (currently Nordea), allowing customers diversified services such as bill payments, balance enquiries, invoice payments, following the use of credit cards, checking when invoices fell due, making buy-and-sell orders for the stock exchange, and receiving portfolio and price information via mobile devices.

For an emerging nation of over 50 million people, a mobile coverage of over 97% in South Africa is impressive, given that cellular telephony was only introduced in South Africa in the early 1990s (International Telecommunications Union, 2011). Such an exponential growth naturally presents enticing propositions for marketing and business and for the financial services sector, with the marketing of remote banking technologies such as mobile and branchless banking (Shambare, 2011).

There is wide agreement (e.g., Bornman, 2016) that within sub-Saharan Africa, South Africa, one of the BRICS countries, is one of the most information-integrated societies due to widespread mobile phone ownership. As cheaper cell phones come onto the market, m-banking is also expected to grow considerably in emerging countries including South Africa. According to Shaikh et al. (2015a), four major banks dominate the banking industry (ABSA, FNB, Nedbank, and Standard Bank) in South Africa, each of which offers m-banking services. The payment of bills and bank transfers through mobile devices represent 54% of monthly transactions on average as opposed to 15.8% of transactions carried out at a bank branch and 11.4% at an automated teller machine (Shambare, 2011).

Unlike Finland, the uptake of the m-banking system has occupied a significant position and exerts a pronounced impact on the minds and lives of South Africans, which is evident from its demographic distribution. A large portion of the South African population lives in rural and remote areas with a

very limited or, in a few cases, negligible Internet presence. That allows the usage of cell phones, including both feature and smartphones, as the only option by which to communicate and access banking information. Under these circumstances, m-banking (and its variant, branchless banking) as a distribution channel become a huge success in South Africa.

## 2.4 M-banking fundamentals

M-banking is an innovative service that allows bank account holders and in a few cases, nonbank account holders, to access their banking information and conduct various transactions using any mobile device such as a cell phone or tablet.

Among the widely used user-end devices, cellphones, personal digital assistances (PDAs), and tablets occupy distinct positions as the most preferred portable devices with different platforms. For instance, PDAs are considered similar to personal computers, and unlike smartphones, which are WAP-enabled and operate on firmware, PDAs have operating systems with the capability of installing software (Petrova, 2002). Yet Muller-Veerse (1999) firmly states that the future belongs to WAP-enabled mobile phones and tablets rather than to PDAs.

M-banking is an innovative, newly developed banking method that has revolutionized the financial services sector across the globe and has fundamentally changed the way banks interact with their customers. M-banking broadens the operations and scope of the banking industry, changes the regulatory and market standards, allows collaboration and cooperation across industries (i.e., telecom, mobile network operators, start-ups, and payment associations—VISA, MasterCard, Union Pay), and creates a new industry dynamics. Industry dynamics, as observed by Lee et al. (2015), refer to the way or process in which all the parties within an industry interact through competition and collaboration. (Figure 4 depicts the m-banking ecosystem.)

Under increased competition in the banking industry, m-banking services, which appeared largely in developed countries, spread across several emerging and developing countries in the mid-1990s and early 2000s. During the early stages of its development, SMS banking dominated m-banking. But soon the financial services sector started investing in mobile technology by enabling mobile web and mobile app channels for online banking and by providing new mobile payment services (Fenu & Pau, 2015). The specialized, customized, dedicated, and downloadable m-banking applications, designed specifically for smartphones and tablets, made possible advanced features and applications, offered ubiquitous access to payment services to consumers, and allowed consumers to conduct a variety of transactions. Ubiquitousness does not strictly require the use of mobile Internet connectivity; as argued by Fenu and Pau (2015), ubiquitous remote mobile payments may happen by accessing the Internet either through the Wi-Fi capabilities of a mobile device or through

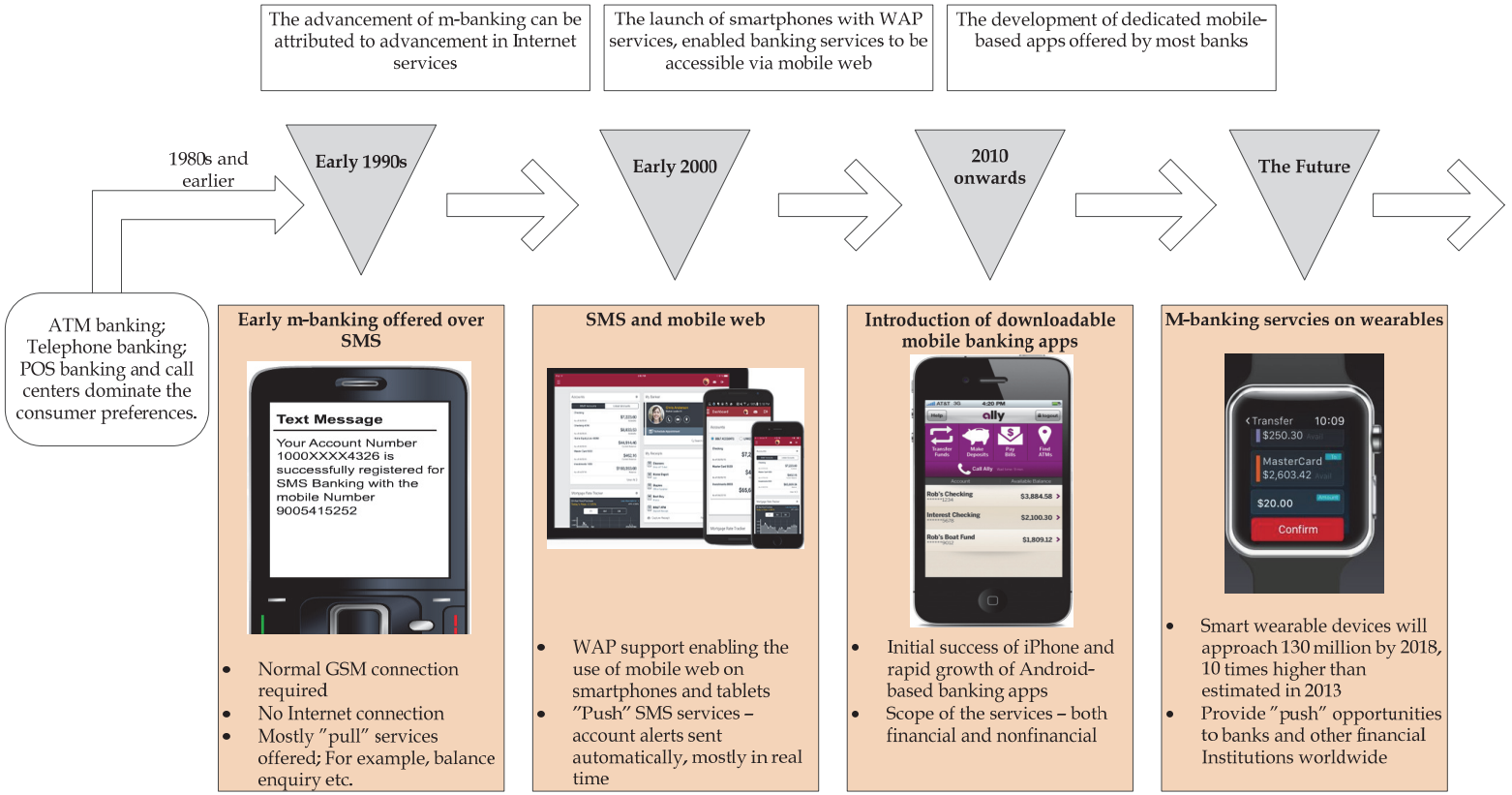


FIGURE 4 Mobile banking ecosystem

near-field communication (NFC) technology for proximity payments, which still constitutes a form of ubiquitous access to a mobile service. Marketing and IS professionals have described this phenomenon of ubiquity as one of the most promising and important developments in the field of mobile commerce and banking business (Oliveira et al., 2014; Lin, 2011).

Presumably, the idea of m-banking was first introduced when mobile devices were being employed during the early 1990s alongside personal computers and were even replacing them in some applications for providing m-banking services (Fenu & Pau, 2015). The German company Paybox, in collaboration with Deutsche Bank, launched the first m-banking service in the early 1990s. It was initially deployed and tested mostly in European countries such as Germany, Spain, Sweden, Austria, and the United Kingdom, but similar developments were also observed in several developed, emerging, and developing countries. For instance, in Korea, m-banking services were first instituted in the mid-2000s (Lee et al., 2015) and in Finland during the mid-1990s (Bank of Finland, 2000). Among developing countries, Kenya was the first to introduce a text-based m-banking service called "M-Pesa" in 2007 (Shaikh & Karjaluoto, 2015a).

Considering a stable infrastructure and an increased thrust toward innovation and technology adoption and usage, m-banking applications and services first appeared in the developed world. By complementing services offered by other delivery channels, the mobile platform offers a convenient additional method for managing money without handling cash (Karjaluoto, 2002a). However, for consumers in the developing world, the appeal of these m-banking services is less about convenience and more about accessibility and affordability (Donner & Tellez, 2008).

As reported by McKinsey and Company (2011), cell phones, including smartphones, were primarily used for payment and information channels by consumers who maintained formal bank accounts. A strategic shift is now targeting the unbanked and underbanked, who are being offered a broad set of financial services in various emerging and developing countries. Consequently, mobile and branchless banking has motivated banks and telecom companies to extend their commercial territory.

### 2.4.1 What is M-banking?

Because there is no universal form of m-banking, its purposes, business models, and structures vary from country to country (Donner & Tellez, 2008). Shaikh and Karjaluoto (2015a) choose to describe m-banking in terms of both an application and a service. They argue that m-banking is usually offered by a bank, a microfinance institute, or a mobile network operator for conducting various financial (remote check deposit, funds transfer) and nonfinancial (balance enquiry, service notifications) transactions using a mobile device. Tam and Oliveira et al. (2016) trace another definition of m-banking as the subset of mobile e-commerce applications offered by the financial industry. Considering the increasing usage of information and communication technologies in the

banking business, Hanafizadeh et al. (2014) and Anderson (2010) consider m-banking as one approach to providing financial services through using information and communication technologies, which facilitates the selection of m-banking services in different demographics, including low-income countries.

Industry and research have identified "m-banking" as one of the most successful business-to-consumer applications (Pousttchi & Schurig, 2004); as a vital electronic banking channel (e.g., Baptista & Oliveira, 2016), an important information system (e.g., Luo, Zhang, & Shim, 2010), an extension of e-payment system (e.g., Schierz, Schilke, & Wirtz, 2010), and as a subset of electronic finance (e.g., Ratten, 2012).

Several studies have analyzed m-banking and its associated antecedents as well as the consequences that influence consumers' adoption and continuous usage of m-banking services; these studies use qualitative, quantitative, and mixed-method data collection and analysis techniques. One common approach to the study of m-banking focuses on consumer behavior (Shaikh & Karjaluoto, 2015a; Shaikh et al., 2015a; Lee et al., 2015). Studies using this approach examine the diffusion patterns and demographic characteristics of m-banking acceptance or pre-adoption (Luarn & Lin, 2005; Afshan & Sharif, 2016), the behavioral intention to continuously use the service (Zhou, 2011; Shaikh et al., 2015a; 2015b), and resistance to m-banking (Laukkanen, Sinkkonen, Laukkanen, & Kivijarvi, 2008).

Considering the considerable amount of research on m-banking and allied services, it is a minor thing to discuss and recommend any specific m-banking definition and the antecedents and consequences influencing consumer attitude and behavior when accepting and using m-banking technology, applications, and services. However, a literary search was conducted, and a few relevant studies published in prominent journals are discussed below.

### 2.4.2 M-banking acceptance, usage, and theories, models, and frameworks developed and used in IS and m-banking research

A fundamental managerial challenge in the implementation of an IS such as m-banking is its acceptance across different consumer segments. Because of the prevalence of mobile devices, which are indispensable to many, the future and growth of m-banking technology and services is largely projected to be positive. However, the adoption and the usage rates for m-banking services have not been stellar so far. Therefore, identifying and understanding the factors influencing attitude and behavioral intention toward adopting and using m-banking is one of the fundamental requisites for the development of m-banking applications and services (Lin, 2011); there are also theoretical and practical reasons for studying these factors.

According to Churchill and Iacobucci (2010), consumer attitude is one of the more pervasive notions in the marketing discipline and in research, because attitudes are closely related to consumer behavior. For instance, consumer acceptance of a product or service is largely based on the consumers' choice, and when they like one brand more than another, they will tend to buy the

preferred brand. Consequently, attitude is the forerunner of behavior (Churchill & Iacobucci, 2010). Karjaluoto (2002b) defines attitude as an overall perception about a product, service, or object, and attitudes are influenced by past behavior.

Against this backdrop, research on individual IS and consumer behavior (marketing) adoption has adopted (and adapted) several theoretical or research models, theories, and frameworks. The research has also investigated several antecedents or perceptions that are believed to impact the potential users' attitudes, behavior and beliefs toward IS acceptance and has explored the causal nature of this effect on acceptance (Bhattacherjee & Sanford, 2006) and usage. Some of these studies are discussed below.

The first commonly adopted and used theory, the innovation diffusion theory (IDT), was developed and proposed by Rogers (1962). IDT (also called the diffusion of innovation, or DOI) is one of the oldest social science theories. IDT explains how, over time, a service, product, or idea gains momentum and diffuses through a specific population or social system. Later, in 1975, Fishbein and Ajzen proposed the theory of reasoned action (TRA), which was followed by the theory of planned behavior (TPB), developed and proposed by Ajzen (1985). TRA and its variant, TPB, were initially developed and used in social psychology research. Both theories focused on and considered individual perceptions as the primary drivers of acceptance intention and behavior. Information technology-specific variants of these theories include the technology acceptance model (TAM) and the unified theory of acceptance and usage of technology (UTAUT) (Bhattacherjee & Sanford, 2006), developed during the late 1980s and 2000s. The elaboration-likelihood model (ELM) was developed by Petty and Cacioppo (1981), and the expectation disconfirmation theory (EDT) by Oliver (1980). Bhattacherjee (2001) extended the EDT and developed the expectation-confirmation model (ECM) to explain continued IS use behavior in the context of the continuous usage of Internet banking (see Figure 5).

These theoretical models framed and tested the hypothesized relationships between different variables known as factors, constructs, antecedents, or consequences. However, in all these relationships, consumer acceptance and usage of an IS appear to be determined by two fundamental types of motivation, extrinsic and intrinsic. According to Van der Heijden (2004), an extrinsically motivated consumer is driven by the expectation of some reward or benefit external to the system–user interaction. On the other hand, an intrinsically motivated consumer is driven by benefits derived from the interaction with the system itself.

Shaikh and Karjaluoto (2015a) conducted a detailed literature review of m-banking adoption studies and analyzed and synthesized several of them. The authors' findings indicate that the m-banking adoption literature commonly relies on the technology acceptance model and its modifications and revealed that compatibility (with lifestyle and device), perceived usefulness, and attitude

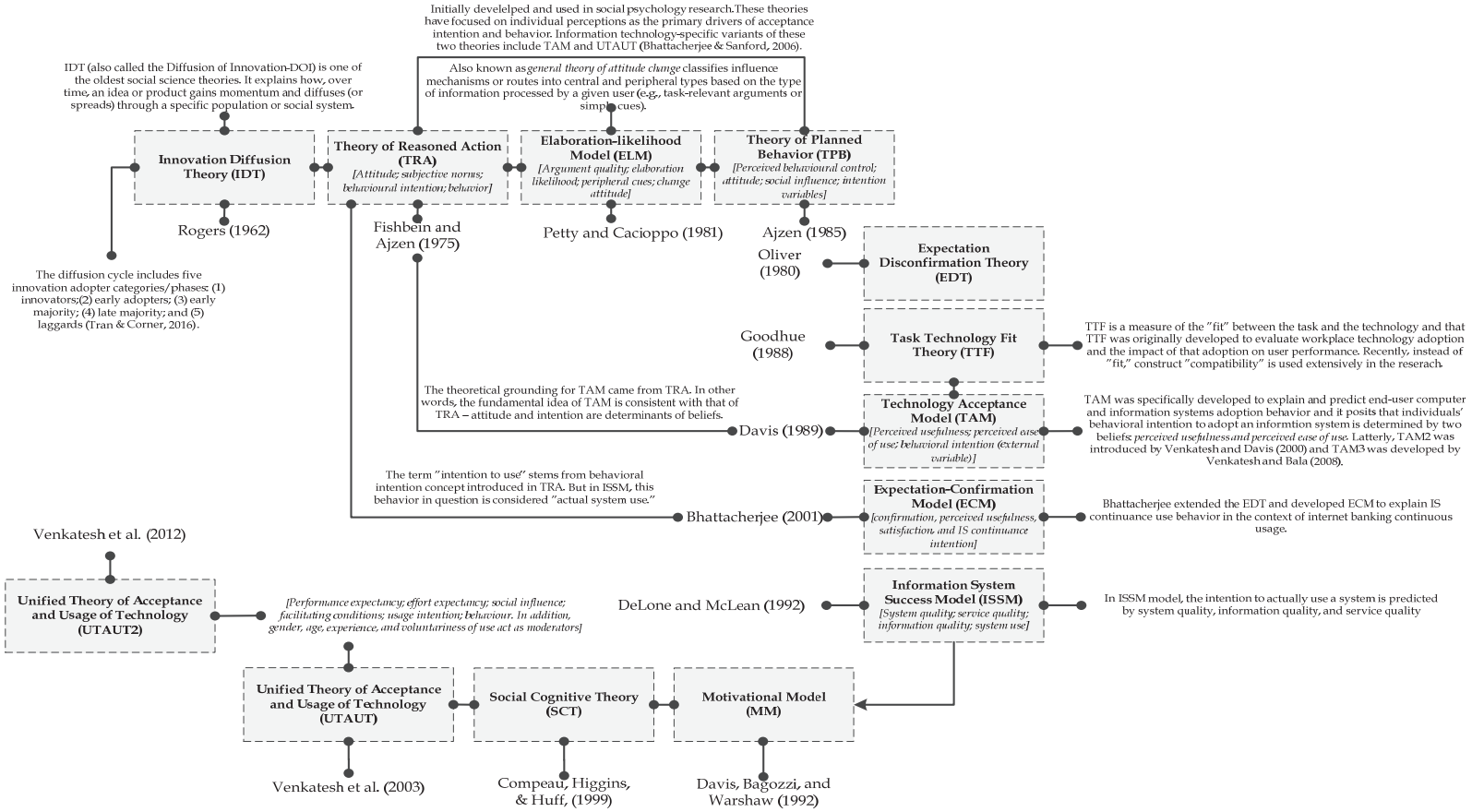


FIGURE 5 Snapshot of theories, models, and frameworks developed over the last seven decades

are the most significant drivers of intentions to adopt m-banking services in different countries. While analyzing the nature, purpose, and effect of various antecedents as proposed by research within several theoretical models (see Figure 3), the author found some similarities between and among different variables. For example:

- The antecedent "relative benefits" was found to be conceptually synonymous with the antecedent "perceived value" (Anckar & D'Incau, 2002), in which a service with more value factors gains increased acceptance.

- From a slightly different angle, the antecedent "perceived benefits" is analogous to the antecedent "perceived usefulness" (Kim, Shin, & Lee, 2009).

- The antecedent "performance expectancy" is akin to the antecedent 'perceived usefulness' of TAM (Venkatesh et al., 2003).

- The antecedent "performance expectancy" is similar to the antecedent 'perceived benefit' (Venkatesh et al., 2003).

- The antecedent "performance expectancy" is also similar to the antecedent "relative advantage" of IDT (Venkatesh et al., 2003). Here the antecedent "performance expectancy" reflects the user perception of performance improvement through using m-banking services, such as convenient payment, fast response, and service effectiveness (Zhou et al., 2010).

- The antecedent "effort expectancy" is similar to the antecedent "perceived ease-of-use" of TAM. The antecedent "effort expectancy" represents the user perception of how difficult it is to use m-banking (Venkatesh et al., 2003).

- The antecedent "effort expectancy" is also found to be similar to the antecedent "complexity" of IDT (Venkatesh et al. 2003). According to Zhou et al. (2010), the relationship between the antecedents "effort expectancy" and "performance expectancy" indicates that when users feel that m-banking is easy to use and does not require much effort, they will have high expectations of obtaining the expected performance. Otherwise, their performance expectancy will be low.

- The antecedent "social influence" is similar to the antecedents "subjective norm" or "social norm" of the theory of reasoned action (Fishbein & Ajzen, 1975). The antecedent "social influence" is defined to mean that individuals perceive that others, such as friends and family,

believe they should use m-banking services (Venkatesh et al., 2003). Consequently, their opinions will affect the user's adoption and usage of m-banking (Hong, Thong, Moon, & Tam, 2008).

- The antecedent "facilitating conditions" is similar to the antecedent perceived behavioral control of the TPB model and reflects the effect of a user's knowledge, ability, and resources (Venkatesh et al., 2003; Zhou et al., 2010). The antecedent "facilitating conditions" refers to how people believe technical infrastructures exist to help them use the system whenever necessary (Venkatesh et al., 2003) and these infrastructures influence both intention and use behavior.

- The antecedent "perceived performance" is similar to the antecedent "perceived usefulness" (Bhattacherjee, 2001).

- The antecedent "perceived self-efficacy" is analogous to the antecedent "perceived ease of use" (Luarn & Lin, 2005). The proposed relationship between the antecedents "perceived self-efficacy" and "perceived ease of use" is based on the theoretical arguments by Davis (1989) and Mathieson (1991). Here, the antecedent "self-efficacy" is defined as the "judgments of how well one can execute courses of action required to deal with prospective situations" (Bandura, 1982, p. 122).

- The antecedent "perceived financial cost" is closely associated with the antecedent "perceived financial resources". The antecedent "perceived financial resources" is found to be a significant antecedent of the behavioral intention to use an IS (Mathieson, Peacock, & Chin, 2001).

- The antecedent "perceived credibility" is closely associated with the antecedent "perceived security & privacy" (Luarn & Lin, 2005). In the m-banking context, the antecedent "perceived credibility" is defined as the extent to which a person believes that the use of m-banking will result in no security or privacy threats (Luarn & Lin, 2005).

- The antecedents "perceived credibility" and "perceived security and privacy" are found to be closely associated with the antecedent "structural assurances" (Kim et al., 2009). In the m-banking context, the antecedent "structural assurances" promises the reliability of banking and other financial transactions, the protection of individual privacy, and transactional confidentiality (Kim et al., 2009). Kim and Prabhakar (2004) suggested that the antecedent "structural assurances" is especially important when the parties in question are involved in financial transactions through electronic channels such as m-banking

### 2.4.3 M-banking resistance behavior

As is the case with other innovative products and services, m-banking application and service adoption faces several areas of resistance from consumers in different countries. Resistance to acceptance varies across developed, emerging, and developing countries, and understanding the reasons for resistance is vital to the successful development, implementation, and marketing of innovations (Laukkanen & Kiviniemi, 2010). Significant advances will not be achieved unless the barriers to adoption are fully understood (Gilbert, Balestrini, & Littleboy, 2004).

For example, consumer skepticism about m-banking, which hinders m-banking adoption and growth in developing countries, is largely driven by the limited range of services and the low efficiency of operations as compared to conventional banking (Kurila et al., 2016). This skepticism is also driven by a lack of availability, poor wireless product quality, and insufficient technology (Riquelme & Rios, 2010) or by cost considerations and a lack of awareness or of the required knowledge, skills, or ability to use the m-banking applications or services (Luarn & Lin, 2005). These knowledge and awareness deficiencies raise barriers, and consequently, many individuals are tempted to postpone or, in some cases, refuse to adopt the m-banking services until the barriers to adoption are circumvented. Researchers have categorized consumer resistance to innovation during the pre-adoption process into two major domains, functional barriers and physiological barriers. Functional barriers are further divided into usage barriers, value barriers, and risk barriers. Physiological barriers are divided into traditional and image barriers.

#### 2.4.3.1 Functional barriers

Among the functional barriers, usage barriers arise when the usage of an innovation is not in conformity or compatible with the workflow, habits, and routines of the consumer; this is considered the most common cause of resistance to innovation (Cruz, Barretto Filgueiras Neto, Muñoz-Gallego, & Laukkanen, 2010). Two factors dominate this behavior—the usability and the ease of use of the innovation (Elbadrawy & Aziz, 2011). The value barrier is another functional barrier, defined as the consumer perceptions of a service or product's practical benefits (Cruz et al., 2010), which may be hedonic (pleasure-related) or utilitarian (task performance-related). In line with the consumer behavior literature, Van der Heijden (2004) explained that the underlying purpose of utilitarian system is to increase the user's task performance as well as to encourage efficiency. Therefore, an important tactic that developers employ is to align IS functionality with task requirements and to allow as little distraction as possible to help the user perform his or her task. The dominant design objective is the productive use of IS. Van der Heijden (2004) further argued that hedonic IS represents a function of the degree to which the user experiences fun or pleasure when using the system. Therefore, important tactics that developers employ are the inclusion of hedonic content, animated images,

and a focus on colors, sounds, and esthetically appealing visual layouts. The dominant design objective is to encourage prolonged use of IS.

Mobile devices, or the mobile channels where the banking transactions are initiated, stored, and transmitted, are inherently information-lean and more uncertain than traditional offline or tele-banking channels (Kim et al. 2009). Because of the inherent risks, customers may not be willing to adopt m-banking without confidence in the available services and in their providers such as banks and microfinance institutions. With these arguments as a backdrop, customer trust is expected to be a critical factor in the success of m-banking adoption and usage (Kim et al. 2009). Prior research (e.g., Koenig-Lewis, Palmer, & Moll, 2010) has also demonstrated that the lack of perceived credibility, that is, the fear of losing personal information to third parties without the knowledge of the consumers, is also significant to m-banking resistance. In today's increasing online activity and mobile telephone usage, perceived risk largely relates to the financial, psychological, physical, or social risks of online transactions (Laukkanen, 2016). Earlier, Ram and Sheth (1989) divided the risk barriers into four types: physical risk (any innovation or development that could harm the user or property); economic risk (higher cost or price of an innovation or development); functional risk (relates to performance uncertainty); and social risk (peer-group or social pressure norms lead to resistance).

The security of the consumer's personal information is paramount, and any unwarranted incident makes consumers skeptical and, as a result, lessens the adoption rate. Extensive research (e.g., Oliveira, et al. 2016; Chang, 2014; Cheng, Lam, & Yeung, 2006) has concluded that information security risk is a major barrier to e-commerce adoption and to the broad adoption and use of mobile payments. Security concerns are also considered an inhibitor to the intention to adopt IS where monetary information is managed.

#### 2.4.3.2 Psychological barriers

Researchers (e.g., Cruz et al. 2010; Ram & Sheth, 1989) have divided the psychological barriers to innovation adoption into two types, traditional and image barriers. Traditional barriers are largely confined to cultural barriers that lead to the inherent fear that any innovation will lead to changes in the users' routine or work life and therefore will reduce the control or authority already in place (Cruz et al., 2010). In other words, when an innovation requires a user to deviate from established practices or traditions, it faces resistance, which implies that the greater the deviation, the greater the resistance (Ram & Sheth, 1989). Unlike the traditional barriers that define consumer behavior, the image barrier is about what a consumer perceives about a product or service and also about the product/service image, company reputation, and even the country of origin, which may be an obstacle to the adoption of innovations (Cruz et al., 2010). If consumers dislike one or more of these associations, they develop a negative image of the innovation, creating the image barrier (Laukkanen, 2016).

This can lead to resistance and, therefore, to a postponement or even a rejection of the technology adoption.

## 2.5 Summary and conclusion

Similar to other innovative services that were introduced toward the end of the twentieth century, m-banking is now a fast emerging banking service. Its adoptability and usage is considered indispensable by many users, and its growth is considered a phenomenon. M-banking is a catalyst for improving banking efficiency and performance, and it is also considered a vehicle for new revenue sources for the banks and other institutions collaborating in its development.

At an earlier period, banks and other financial institutions such as microfinance dominated the development and deployment of m-banking products and services. Later, the financial sector reform programs instituted in many countries allowed a greater participation, co-creation, and collaboration across industries, including nonfinancial institutions, which were previously restrained in offering financial services to consumers. Nonbanking institutions include FinTech, start-ups, telecoms/mobile carriers, credit card processors, software houses, and third-party service provides. This collaboration enlarged the scope of digital banking services, increasing the efficiency and outreach of banking services in emerging countries, overcoming financial exclusion and physical distance by allowing remote access to banking transactions. Therefore, this phenomenon demands the scholarship and empirical research to understand the important factors that influence the consumer's decisions about m-banking adoption and usage. Against this backdrop, several studies were undertaken in developed, emerging, and developing countries on m-banking channels, applications, products, and services under two major domains—adoption and usage.

Considering importance and usage, m-banking maintains the distinction of being one of the most important banking channels (e.g., Adesina & Ayo, 2010) and being an important information system (e.g., Luo et al., 2010), an extension of e-payment systems (e.g., Schierz et al., 2010), an extension of banking and financial services onto mobile networks and devices (Lee et al., 2015), and a subset of e-finance (e.g., Ratten, 2012). M-banking is an emerging application of mobile commerce that could become an additional revenue source to both banks and telecom service providers (Kim et al., 2009). Especially after considering the huge cost involved in opening and maintaining a physical bank branch, m-banking and branchless banking offer customers a novel alternative to formal banking and payment services on their mobile devices, facilitating and enabling the instant transmission of banking information between the consumer and the banking institute and other financial service providers.

Among the widely used alternative delivery channels such as ATMs, telephone, and the Internet, mobile retains its prominence, being highly

convenient and offering several options. Similarly, considering an exponential growth curve in the usage and adoption of mobile devices and mobile technology in general, the term m-banking is no longer metaphorical but is generally defined as one of the alternative banking delivery channels that allow consumers to access their banking information and conduct transactions using portable devices. These transitions have been distinguished as financial and nonfinancial. Notable financial transactions include funds transfer and utility bill payments, while nonfinancial transactions include balance enquiries and finding ATM locations.

With the increasing functionalities offered on cell phones, the usage of such phones has challenged all market predictions, increasing by massive amounts. However, the consumer acceptance of new innovation or IS is underpinned by personal interest as well as benefit. There has not been any explicit explanation in the literature that allows the industry to gauge the severity of the barriers or resistance and to design a product and offer a service that will thwart the resistance and will increase acceptance as well as long-term usage. The one respected and widely recognized strategy is the consumer co-creation of the product and service development and of value creation. Here the consumer is willing to provide ideas for new goods or services development that may fulfill needs that have not yet been understood or met by the market or that might improve the existing offerings (Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010). But despite resistance, m-banking channels allow customers features they cannot find online, such as remote check deposit, person-to-person (P2P) payments, and real-time fraud notification (Deloitte, 2011). Such features make m-banking a richer experience and therefore drive adoption and usage.

# 3 RESEARCH ORIENTATION AND METHODS

This chapter is concerned primarily with some important issues relating to the research philosophy used, the approaches adopted, and the strategies deployed to examine IS/IT in general and m-banking in particular and that have guided the various schools of thought regarding consumer behavior and IS research.

## 3.1 Research philosophy

Especially with regard to the research philosophy followed in this dissertation, I will discuss in detail the following research paradigms: epistemology, ontology (and its two aspects, objectivism and subjectivism), methodology, and methods. Similarly, I will also discuss the deductive and inductive approaches and the quantitative-qualitative dichotomy.

Hauser (1985) argues that knowledge is developed, for example, via the use of methods such as survey research, with trends statistically measured, described, and tabulated. According to Saunders, Lewis, and Thornhill (2009), in research philosophy a researcher adopts contains important assumptions about the way in which that researcher views the world. As a result, these assumptions underpin both the research strategy and the methods one chooses as part of that strategy.

The research paradigms and philosophy that underpin marketing research projects are generally seen to be an important feature of a doctoral inquiry (Tadajewski, 2004). However, prior research (e.g., Saunders et al., 2009; Guba, 1990; Guba & Lincoln, 1989) with overlapping emphasis and meanings, has used different descriptions, categorizations, and classifications of research paradigms and philosophies in relation to research methods. Although these studies' definitions of research philosophies' ontology and epistemology have a common theme, with a bit of different meaning and emphasis, there seems to be no consensus with respect to the classification and categorization of these paradigms (Mkansi & Acheampong, 2012).

Nonetheless, prior to going into the philosophical details of this research, when I examined the research on consumer behavior in the context of m-banking and generally in the context of IS, I observed that the majority of the literature is heterogeneous with respect to research approaches (deductive, inductive), methodological choices (qualitative, quantitative, mixed-method), and the models, frameworks, and theories used (See Figure 7, for example). In addition, inconsistency in the possible levels of analysis (such as consumers, non-users vs. users of technology, professionals, organizations, governments) has further aggravated things and has created a complex situation in which to apply or follow a generally agreed upon research design or philosophy with respect to consumer behavior and IS research. This situation exists perhaps due to the fact that the consumer behavior and IS fields are highly interdisciplinary in nature.

Consequently, dynamic consumer behavior and the interdisciplinary nature of the IS field have led to the adoption of a number of theoretical approaches, strategies, and methods from other subject disciplines, often with little regard for the associated baggage of their underlying assumptions (Dobson, 2002; Garcia & Quek, 1997). As a result, the research (such as that in the area of consumer behavior and IS) is found to have a greater concentration on the outcomes and on practical, strategic, or methodological issues rather than on the ontological, epistemological, and philosophical reasoning behind a particular research approach (Dobson, 2002).

Nonetheless, according to Tadajewski (2004), marketing scholars need to be aware of the philosophical assumptions embedded in their research output, because all research is underpinned and delimited by a particular stance toward the world they study (ontology) and how this is investigated (epistemology), which, in turn, influences the methodology (qualitative, quantitative, mixed-method) used to seek and expand knowledge. Here, Tadajewski (2004) provides considerable relief to the marketing research community by proposing and identifying an emergent form of theory development, namely multi-paradigm research.

According to Tadajewski (2004, p. 323), the underlying purposes in identifying the multi-paradigm, especially in the marketing discipline, are largely "*to facilitate research comparisons across paradigms, provide a more comprehensive view of the phenomena of interest, [and] encourage researchers/research teams to adopt a metaparadigm vantage position to consider the potential contribution of disparate paradigm lenses.*"

The paradigm concept, which is used interchangeably with other philosophical concepts, is central to all research projects (Gummerson, 2003). Earlier, Kuhn (1962, p. 9) defined a paradigm as "*universally recognized scientific achievements that for a time provide model solutions to a community of practitioners.*" Later on, Burrell and Morgan (1979) suggested four paradigms: functionalist (or positivist), interpretive, critical (or radical humanist), and radical structuralist paradigms. Among these four, the positivist and the interpretive paradigms have become the two main perspectives used in the production of marketing

(and consumer) theory (Morgan, 1992). Nonetheless, the paradigm followed in this dissertation is post-positivist.

With respect to the two popular research philosophies, it is generally believed that every empirical and non-empirical study is influenced by epistemological and ontological assumptions and that these assumptions are consequential to each other. For example, a researcher's view of ontology (reality) affects his or her epistemological (knowledge) persuasion, which, in turn, affects the choice of methodology (Holden & Lynch, 2004).

Epistemology represents that which constitutes acceptable knowledge in a particular field of study, such as consumer behavior. On the other hand, ontology is concerned with the nature of reality and encompasses two aspects: objectivism and subjectivism (Saunders et al., 2009). To understand these two relatively opposite points of view, Cunliffe (2010) offers a comprehensive explanation. According to Cunliffe, to understand the objectivism-subjectivism aspects of research, it is important first to understand the subject–object distinction. A subject is generally conceived of as a reflective individual, an author of meaning, or an actor. On the other hand, an object is a material artifact, symbol, text, universal truth, law, or principle. Objects are generally assumed to exist independently from perception.

### 3.1.1 Inductive and deductive reasoning

Moving from research paradigms to research approaches, Western research traditions have largely adopted and used either deductive and/or inductive research approaches (Kovács & Spens, 2005), which may result in the acquisition of new knowledge. These approaches to reasoning have also dominated marketing science (Hyde, 2000). Nonetheless, a difference is found between research approach and research process. For instance, a research approach is defined as a means of conscious scientific reasoning (Peirce, 1931; Kovács & Spens, 2005). The research process, on the other hand, is seen as the summary of all the sequential steps a scholar engages in that are necessary to follow the path of a specific research approach (Kovács & Spens, 2005).

Kovács and Spens (2005) argued that deductive research scans theory, derives logical conclusions from this theory, and presents these conclusions in the form of hypotheses and propositions. Afterwards, this approach tests these in an empirical setting and then presents its general conclusions based on the corroboration or falsification of its self-generated hypotheses/propositions. Inductive logic follows the opposite path. Here, observations about the world lead to emerging propositions and to their generalization in a theoretical frame. This follows the pattern case-result-rule of Kovács and Spens (2005).

Research in the marketing field, including consumer behavior, has historically emphasized deductive processes (Hyde, 2000). Here, Deshpande (1983) criticized marketing scholars for being little involved in theory generation (the inductive approach). Instead, the methods that marketing science has historically developed are those suited to confirming theories (the deductive approach) rather than discovering them (inductive). In addition to

deductive and inductive reasoning, research (e.g., Kovács & Spens, 2005) has stressed the importance of an abductive approach, or "abduction," as a third form of research approach.

Deductive research or reasoning follows a conscious direction from a general law to a specific case (Taylor et al., 2002), and therefore, a specific conclusion is certain in a deductive approach. An inductive research approach reasons through, moving from a specific case or a collection of observations to general law (Alvesson & Sköldberg, 1994), and it therefore provides a more generalized conclusion in light of the accumulated evidence. These conclusions derived from inductive reasoning are the most likely, albeit not certain, and they increase human knowledge. More often, scholarship in the management science and information systems field has used a mix of these approaches called the abductive research approach.

Comparing these three research approaches, Kovács and Spens (2005) explained that both inductive and abductive research approaches start with empirical observations prior to any theoretical framework indicated in the research process. In an inductive process, this theoretical framework is missing entirely, while an abductive process can also begin by discarding a theory. In contrast, deductive research always starts from a given theoretical framework; the hypotheses or propositions that should be further evaluated are already given prior to any empirical research.

The abductive approach actually stems from insight gained when the scholarship follows neither the pattern of pure deduction nor of pure induction (Taylor et al., 2002). Abductive reasoning usually starts with an incomplete set of observations and the information at hand, which is often incomplete, and the reasoning process proceeds to a possible explanation.

Based on these arguments, this dissertation research follows an abductive research process, as further explained in section 3.2.

### 3.1.2 Quantitative-qualitative dichotomy

Historically, studies pertaining to natural and pure science projects have usually applied quantitative methods to collect, analyze, and interpret primary and secondary data and to report findings with an underlying objective of investigating a natural phenomenon. The underlying goal of quantitative research, also known as positivist research, is to show the relationships between prediction, theory testing, and establishing facts. The commonly used quantitative methods include the survey method. Here the primary data, also known as hard data, is collected using well-designed and pretested instruments or questionnaires consisting of several Likert scale items or questions. Depending on the nature, purpose, and scope of the study, methods used when administrating survey instruments and collecting data may include online surveys, on-site surveys, web-based surveys, and email/mail surveys. Other popular quantitative methods include laboratory experiments, structured interviewing, and structured observations.

Unlike the quantitative approach which is considered an objective method approach, the qualitative approach, also known as a narrative or interpretive approach, is more subjective in nature, enabling the researcher to study social and cultural phenomena (Myers, 1997). The underlying goal of qualitative research is to develop understanding and describe multiple realities. Being more subjective in nature, qualitative methods are based on personal observations and are preferably used when investigating a new phenomenon, a new information system, a service, or a product. For example, one-to-one semi-structured interviews are commonly used as primary data (also known as soft or descriptive data) in qualitative research projects; this collection method provides a deeper understanding of the phenomena, and previous research has demonstrated such interviews' feasibility in studying innovative mobile services (Shaikh et al., 2015b; Jarvenpaa & Lang, 2005). Other qualitative methods include case study research, ethnography, and action research. Qualitative data sources include field notes, photographs, interview transcripts, documents and texts, and the researcher's impressions and reactions (Myers, 1997).

Gable (1994) contends that a case study research approach uses a qualitative analysis technique; the primary data are collected from one or more organizations deploying various data collection methods such as participant-observation and in-depth semi-structured interviews. A case study seeks to understand the problem being investigated, and it provides the opportunity to ask penetrating questions and to capture the richness of organizational behavior. While disagreeing with the proposition, Yin (1994) argued that a case study research strategy should not be confused with a qualitative study. Instead, case studies can be based on any mix of qualitative and quantitative evidence. Following much the same line, Flyvbjerg (2006) considered the case study research method a necessity and a sufficient method for certain important research tasks in the social sciences. Nonetheless, conventional wisdom suggests that the case study research method involves several limitations, a few of which will be discussed here.

According to Flyvbjerg (2006) and Hodkinson and Hodkinson (2001), in a case study, theoretical knowledge is considered more valuable than practical knowledge. A case study is not generalizable in the conventional sense, and therefore, a single-case study cannot contribute to scientific development. Case studies are easy to dismiss, and they usually cannot address a large number of relevant and appropriate research questions. The case study is most useful for generating hypotheses, and other methods are more suitable for hypothesis testing and theory building. The case study contains a bias toward verification, and it is often difficult to summarize specific case studies.

Coming back to my discussion on the qualitative and quantitative research strategies, another school of thought allows two somewhat overlapping but also different research techniques, based on which a variety of studies have been conducted. These two techniques, longitudinal and cross-sectional, can be either qualitative or quantitative.

Longitudinal studies involve the collection of primary data over an extended period of time; this does not necessarily mean investigation over a longer time period, but the duration can vary from a few weeks to a few months to a few years. Irrespective of the duration, it is important that the successive data sets or measurements that are taken at different points in time in a longitudinal study should come from the same respondents or study participants. Where different respondents are studied at different points in time, the study is called cross-sectional (Cohen & Manion, 1989). Other names that have been used to represent longitudinal studies include follow-up study and cohort study (in the United Kingdom) and panel study (in the United States).

## 3.2 Research methodology

Over the past four decades, the debate over the relative virtues of quantitative and qualitative methodology has gained significant impetus (Bryman, 1984) from the researchers serving the natural science and social science fields. Consequently, a clear distinction dominates the adoption and application of the two research traditions, qualitative and quantitative, and this distinction largely depends upon the fundamental philosophical assumptions of the researcher (Myers, 1997). Eventually, a mixed-method approach combining different research methods was added to the research, and it was adopted and used by researchers in various fields when conducting multimethod studies. Kraemer (1991) went one step further and contended that survey research methodology, while very useful, is significantly improved when used in combination with other qualitative research methods. Unlike the case study research discussed below, qualitative and quantitative research strategies are considered a suitable basis for generalization, which means that these methods contribute to scientific development and provide greater implications for the industry. I will discuss generalization in the next section.

The purpose of this dissertation is multifold. First, it is intended to increase the understanding of IS/IT and m-banking and their adoption and usage. Second, its purpose is to identify the drivers or the antecedents and consequences influencing the consumer decision-making process when choosing to adopt and use m-banking services and technology. Third, the dissertation intends to fill the knowledge gap and, fourth, to provide a road map for building theories from studies. This road map synthesizes previous work on research methods (both qualitative and quantitate) and suggests a theoretical framework and the role of existing literature in the broader field of consumer behavior (marketing) and IS and specifically in the m-banking context. It uses *abductive* research process that contains the ingredients of both deductive and inductive approaches to provide a broader understanding of the IS/IT, m-banking and of the antecedents and consequences that persuade both existing and potential bank consumers to adopt and continuously use m-

banking services. Table 3 provides the details of the articles included in this dissertation.

TABLE 3: A snapshot of articles included in the dissertation

| Article | Research Focus | Research Stream | Research Philosophy /Design | Data Source | Unit of Analysis | RQ |
|---|---|---|---|---|---|---|
| 1 | Literature Review | Continuous usage/post-adoption (IS/IT including mobile technologies) | Positivist<br>Descriptive | Secondary data source<br>In-depth investigation<br>Qualitative | Total of 152 relevant publications, including journal papers, conference proceedings, books, and popular market reports | 1 |
| 2 | Literature Review | Acceptance/Pre-adoption | Positivist<br>Descriptive | Secondary data source<br>In-depth investigation<br>Qualitative | Total of 55 relevant publications, including journal articles and conference publications | 2 |
| 3 | M-banking Technology | Continuous usage/post-adoption | Positivist<br>Explorative | Secondary & Primary<br>Survey instrument<br>Quantitative | Total of 273 experienced m-banking technology users from Finland | 3 |
| 4 | M-banking Services/ multi-country study | Continuous usage/post-adoption | Interpretivist<br>Exploratory | Secondary & Primary<br>Semi-structured interviews<br>Qualitative | Total of 36 in-depth semi-structured interviews conducted with experienced m-banking users in Jyväskylä and Johannesburg | 4 |

Research methodology is very scientific in nature and is not only different from the research method but also has a wider scope. In brief, a research method is a subset of research methodology, which suggests how to solve the research problem systematically. According to Kothari (2004), when we describe research methodology, we not only describe the research methods but we move one step further and consider the scientific logic behind the methods we use in the context of our research study. Here we explain why we are using a particular method or technique and why we are not using others, so the research results are capable of being evaluated either by the researcher him- or herself or by others.

This dissertation provides a rich overview and pivotal information on the research methodology used to examine the research question, on the sampling techniques used, and on the methods used to collect and analyze the empirical data to interpret the results and report the findings. Instead of exclusively relying on one data collection technique and on one statistical or experimental

testing of hypotheses, the research methodology and data sources used in this dissertation include both qualitative and quantitative methods, based on the analysis of the primary and secondary data source.

The units of analysis, or the participants of the study, include students, professionals, entrepreneurs, and both men and women in different age groups. Prior research has differentiated between micro and macro units of analysis. For example, using a mixed-method research technique, Kaplan and Duchon (1988) conducted a case study of a newly implemented information system in an urban metropolitan university medical center. This study included both macro and micro units of analysis, constituting workers and managers, laboratories, the department, and finally, the organization as a whole.

As argued by Markus and Robey (1988), mixing different units of analysis allows an exploration of the interplay among units at each level and across levels. These distinctive characteristics maintained between and among the sample groups are important when considering research objectives, research questions, and research settings. For instance, within the m-banking, or generally, within the IS adoption and usage research stream, research participants are largely categorized as potential customers (for pre-adoption studies) and repeat customers (for post-adoption studies). For potential customers, the bank account and the ownership of a cellphone or tablet does not matter in addressing the research questions and achieving the research objectives.

The major reasons underpinning the use of different data collection techniques and research methodologies in this article-based dissertation lie in the fact that no single data collection technique is impeccable and that an exclusive reliance on statistical or experimental testing of hypotheses has been criticized in the social science research (Kaplan & Duchon, 1988). For instance, some major criticisms of questionnaire surveys include poor questionnaire design, the use of "convenience" rather than random samples (Cowton, 1998), low response rates, the failure to address the issue of nonresponse bias (Randall & Gibson, 1990), and the use of poor scenarios (Weber, 1992).

At a very basic level, secondary data is defined as the process of collecting and reusing data that is not primarily meant for the research question at hand. Early on, for qualitative research methods based on secondary data sources, mostly non-numeric data was used. When compared to interviews and survey questionnaire results, what stimulates me most about using secondary data is its availability, reliability, financial incentive, time economies, and convenience of use. Researchers have discussed several advantages in terms of cost and effort when using secondary data (Cowton, 1998). The importance of using secondary data for analysis purposes has been established in the literature (e.g., Smith, 2008), and the process of secondary data analysis has been widely considered a legitimate approach to guide scientific enquiry and knowledge development (Castle, 2003).

The underlying purposes of writing the literature reviews (Articles 1 & 3) based on secondary data sources were several. First, at the outset of my

dissertation research, these literature reviews were targeted toward grasping scientific studies, including journal papers and conference proceedings, where a significant theme was consumer behavior in adopting and using the digital banking technologies, products, and services. Second, considering the centrality of literature reviews in advancing knowledge, literature reviews are strongly recommended for doctoral students and are considered a precondition for doing a substantive, thorough, and sophisticated study (Boote & Beile, 2005). Further, Shulman (1999) argued that generativity, discipline, publication, and peer review are the hallmarks of scholarship. Shulman defined generativity as the ability to build on the scholarship and research of those who have come before us. Third, these literature reviews helped me familiarize myself with and broaden my understanding of the state-of-the-art developments taking place in m-banking and its variants such as Internet banking and branchless banking. Consequently, the objective of conducting two major literature reviews was not to report the claims made in past research but to examine critically the research methods used and determine the methodology and measures of m-banking as well the dependent, independent, and control variables used in previous studies.

When compiling a systematic review, the identification of relevant studies is considered to be "the most fundamental challenge" (McManus et al., 1998). Against this backdrop, and after considering the vastness of the marketing (consumer behavior), IS, and digital banking literature, a systematic approach consisting of four steps was adopted. First, we developed the criteria for the types of studies to be included in our analysis (including key empirical and nonempirical papers, a few records of conference proceedings, leading books, and the most popular market reports). Secondly, the most relevant and suitable phrases or key words were identified and listed. These key words, for instance, for Article 1, entitled "M-banking adoption—A literature review," included "m-banking adoption," "m-banking acceptance," "m-banking adoption intention," "m-banking adoption attitude," "m-banking usage behavior," "m-banking embracing," and "m-banking utilization." In the third step, a comprehensive literature search strategy was drafted and implemented. This literature search strategy included the most comprehensive horizontal search (e.g., Google Scholar) as well as searches in journals (e.g., *MIS Quarterly*) or in scholarly databases (e.g., ScienceDirect/Elsevier). A specific vertical search was conducted to identify, shortlist, and include the most relevant and appropriate studies in the literature review studies (Article 1 and 3). The fourth step primarily included the documentation as well as the coding of the various studies included in the analysis.

A considerable quantity of relevant articles was collected (using different digital libraries and scholarly databases), summarized (in the form of different tables), and synthesized (in order to gain new perspectives as well as to enhance the subject vocabulary) with respect to the most relevant information on m-banking adoption and usage, not to mention the antecedents and consequences that influence consumer behavior when considering m-banking

applications and services offered by banking companies. Note also that these literature reviews include several scientific articles, conference proceedings, book chapters, archives, and markets that played a vital role in delimiting the research problem. They helped in seeking new lines of inquiry and in distinguish what has been done from what needs to be done in the broader field of m-banking, thereby avoiding fruitless approaches. These sources helped in the discovery of important variables and consequences relevant to m-banking, in the gaining of methodological insights, and in the identification of recommendations for further research (Gall, Borg, & Gall, 1996; Randolph, 2009; Hart, 1998).

Unlike secondary data, primary data originates with or is collected by the researcher for the purpose of the investigation at hand (Churchill & Iacobucci, 2010).

Primary data for this dissertation was collected using two major techniques, semi-structured in-depth interviews (see Article 4) and a survey questionnaire (see Article 3). A systematic approach was used in designing and pre-testing the interview protocol and survey instrument. Considering the aim and research question of Article 4, the interview protocol consists of several items or questions designed and pretested in a pilot study with a small sample of business students at a local business institute located in Jyväskylä city; these students had m-banking and other online banking service usage experience. Based on the feedback received, the interview protocol was modified to improve the clarity and understanding of the questions included in the protocol.

The study aim of Article 4 is to examine and compare m-banking service usage in Finland and South Africa. One of the research scholars in Johannesburg, South Africa, was approached for data collection; email messages and Skype were used to contact and interact with this researcher. A total of 36 semi-structured in-depth interviews were conducted in Johannesburg and also in Jyväskylä (Finland), with people from different walks of life who had varying m-banking usage experience either on a cell phone or tablet with mobile Internet access and who had one or more bank accounts. A purposeful sampling technique was used, in which the participants were selected according to the needs of the study (Morse, 1991); in our case, this selection occurred on the basis of their m-banking experience (minimum six months). All the interviews were conducted in a controlled environment offering a quiet spot where the interviewee was informed about the purpose and objective of the study. The interview protocol was shown in advance before the start of the interview, and interviewee consent was acquired for recording the interview conversation on a MP3 player. All participants were assured of confidentiality. Interviews were transcribed using a traditional text program and without using any standard statistical software package.

In consumer research using a qualitative research strategy, a few controversies take place at the level of epistemology with respect to how primary data can and should be evaluated. At the heart of this debate, as argued by Spiggle (1994, p. 491), is how readers can have faith in the

conclusions, inferences, and results, what controls are employed over them, and how researchers can adequately represent them to others.

In the light of these epistemological concerns, a comprehensive and well established three-step approach was used in Article 4 to analyze and interpret the qualitative data. These steps included data reduction, data display, and verification (Miles & Huberman, 1984). In the first stage, the transcriptions were organized to reveal anticipated factors related to reasons for using m-banking services. The data analysis began after the first interviews and continued until the completion of the interview process. This method helped the researchers to plan and direct the ensuing interviews. In the second phase, these factors were analyzed individually. We also verified the data by sending the transcribed data and results of the study to the interviewees and inviting their comments. Finally, the interviewees' comments were incorporated where appropriate.

In Article 3, the author used the survey instrument to collect the primary data from the experienced m-banking users in Finland. Researchers (e.g., Coyne, 1997) believe that an appropriate sample selection has a profound impact on the ultimate quality of the research analysis and outcomes. After we revisited the research aim and objectives, the research participants were selected from Jyväskylä city in Finland, using purposeful sampling methods. Patton (1990) argues that the logic and power of purposeful sampling lies in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research; thus the term "purposeful sampling" is used. Following these arguments and in order to achieve the research objectives, the data was collected from those participants who had a relationship (checking or savings) with a bank, who had used an m-banking application and/or services over the previous six months, and who also owned a smartphone or tablet.

According to Fink (1995), a survey instrument is a system of collecting information to describe, compare, and explain with respect to practice, knowledge, behavior, or attitude. Therefore, the reliability and the validity of the survey instrument used in a quantitative study plays a pivotal role. In a frequently cited article, Golafshani (2003) stated that the use of reliability and validity are common in quantitative research and that they are primarily meant to reflect multiple ways of establishing truth. Golafshani (2003) further argued that the definitions of reliability and validity in quantitative research reveal two strands—first, whether the result is replicable (reliability), and second, whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure (validity). According to Karjaluoto (2002b), the reliability (or precision) and the validity (or accuracy) describe the degree to which the measuring or survey instrument is free of any measurement error. Given their importance, reliability and validity have been considered essential criteria for developing trustworthy information about the unit under study (consumers in this case) and their behavior (Karjaluoto, 2002b) in both qualitative and quantitative research.

A systematic approach was adopted in constructing, validating, pretesting, and finalizing the survey questionnaire as well as operationalizing the constructs. For example, the five latent variables (constructs) of interest to this study were self-congruence (SC), perceived risk (PR), perceived value (PEVA), continuous usage (USE), and word of mouth (WOM). All constructs were measured using multiple items drawn from prevalidated instruments used in previous research.

### 3.2.1 Reliability and validity of scale and data collected

There have been numerous studies that have examined how scale format affects scale reliability and validity. Simulation and empirical studies have generally concurred that reliability and validity are improved by using 5- to 7-point scales rather than coarser ones with fewer scale points (Dawes, 2008). Supporting these arguments, a Likert scale with 7 points anchored between "strongly disagree" and "strongly agree" was used in the survey instrument, where the study participants were asked to select an appropriate number to denote their level of agreement.

Since the study (Article 3) was conducted among Finnish residents having m-banking application usage experience, a standard procedure was adopted, and the survey items were translated from English to Finnish by a researcher who was a native Finnish speaker. To ensure consistency, the items were back-translated into English by a different researcher. The survey instrument was pretested in a pilot study at a university located in Jyväskylä with a sample of business and information technology students who had m-banking application usage experience. Based on the feedback received during the pilot test, slight changes were made in the survey instrument to improve clarity and to validate the reliability of the items (Kim et al., 2009).

A professional marketing research firm was hired to collect data from experienced m-banking users during a four-week period in late 2014. In all, 392 respondents participated in the study and completed the questionnaire. Of these 392 respondents, 273 met the sampling criterion of being experienced m-banking users. To assess response bias, the responses of the first 25% of respondents were compared to the responses of the last 25% of respondents; there were no significant differences between the responses of the two groups at the $p < 0.05$ level.

During the data analysis procedure, all the measurement scales used in the survey instrument were tested for reliability and construct validity using confirmatory factor analysis (CFA). Prior research (Bhattacherjee & Sanford, 2006; Bagozzi & Phillips, 1982) has argued that in considering the prevalidated measurement scales, as was the case with this study, CFA is more appropriate than alternative statistical techniques such as exploratory factor analysis. Similarly, in survey studies where the respondents attempt to respond to the items in a single questionnaire at the same point in time, the data are likely to be susceptible to common method bias (Malhotra, Kim, & Patil, 2006) Consequently, common method bias (CMB) has been identified as a main

source of measurement error as well as a major potential validity threat to published findings in social science (Sharma, Yetton, & Crawford, 2009), behavioral (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), and IS (Malhotra et al., 2006) research. Considering the significance of assessing CMB, we followed the procedure recommended by Podsakoff et al. (2003) to determine CMB, because prior research (e.g., Limayem, Hirt, & Cheung, 2007) has favored the use of this method. The procedure specifies a common method construct whose indicators include all of the indicators used in the latent variables in the research model. Our analysis found that the average factor loading was 0.78 and that the average variance explained by the common method construct was 0.02 (or 26%), indicating that CMB was not a serious issue and also that it did not significantly affect our study's results.

Article 4 uses the interview methodology to collect the data from experienced m-banking service users in Finland and South Africa. The interview is the primary method used in qualitative research, with a vast majority of previous research emphasizing the conducting of face-to-face interviews (Oltmann, 2016). In light of these arguments, 18 semi-structured and in-depth face-to-face interviews were conducted at each location (for a total of 36 interviews). A systematic approach was designed and adopted in order to ensure that the research settings in these two different locations were congruent and as well as to ensure the validity, reliability, and verification of the data collected.

For instance, rigorous sessions were held with the scholars in South Africa to develop and pre-test the interview protocol. The interview conversations were recorded and transcribed. In total, 36 interviews (18 interviews at each location) were conducted. A controlled environment was used where the individuals were invited to participate in the study. The study objectives were defined, and the participants' consent to record their conversations was also secured.

Considering their diverging nature and data collection methodologies, both quantitative and qualitative types of research use different data analysis approaches. For instance, in quantitative research, data analysis usually occurs after all or much of the data have been collected (Burnard et al., 2008). In qualitative research, data analysis often begins during or immediately after the first data are collected or the first interview is conducted. This helps the researcher identify the problems and/or the emerging findings at the initial stage. Similarly, the initial analysis of the data may also further inform subsequent data collection (Burnard et al., 2008). Consequently, the data analysis in this study began after the first interviews were conducted at both locations. This method helped me to plan and direct the ensuing interviews (Shaikh & Karjaluoto, 2015a).

The transcripts (text data) were prepared and sent to the study participants at each location for the necessary verification. This verification process is recognized in the literature and is popularly known as member validation or a member check. According to Sandelowski (1993), member

validation is a technique used to establish the validity of the researchers' interpretation of the primary data collected from the study participants and to ensure that these participants have access to what they said in the interview.

Based on the feedback received from the study participants, and after considering the research purpose and objectives, necessary changes in wording were made in the transcripts where necessary.

Since the data collected from the 36 interviews was not large in volume, no computer package or application or any other automated instrument was used to manage, sort, or analyze the data. Instead, a directed approach to qualitative content analysis was applied.

## 3.3 Summary and conclusion

The nature of research has been correctly defined by Mouly (1978), who argued that research is best conceived as the process of arriving at dependable solutions to problems through the planned and systematic collection, analysis, and interpretation of data. Research is a most important tool for advancing knowledge, for promoting progress, and for enabling people to relate more effectively to their environment, to accomplish their purposes, and to resolve conflicts.

In my endeavor to better understand the IS/IT in general and m-banking in particular, this article-based empirical dissertation uses an abductive research approach and follows both qualitative and quantitative research methods in collecting and analyzing the data. Differences were observed between the research method and methodology. For instance, research methods are a range of approaches used to gather the data that are to be used as a basis for inference and interpretation, for explanation, and for prediction. On the other hand, research methodology is the technique and procedures used in the process of gathering data.

Two different sources of data were used—primary and secondary. Primary data, which is considered original to the problem under study, was collected using different data collection techniques such as interviews and a survey instrument. Secondary data sources include scholarly papers, conference proceedings, book chapters, and so forth. The major reasons underlying the usage of different data collection techniques and research methodologies in this dissertation lie in the fact that no single data collection technique is impeccable and that an exclusive reliance on statistical or experimental testing of hypotheses has been criticized in the social science research.

# 4 SUMMARY OF THE RESULTS OF EACH ARTICLE

The underlying purpose of this section is to provide a detailed overview of the research findings of each article included in this dissertation. The discussion as well as the implications, limitations, and future research directions of each study are discussed in the next chapter.

## 4.1 Article 1: Making the most of information technology & system usage: A literature review, framework, and future research agenda

This article reviews the post-adoption literature discussing different facets of IS/IT including m-banking.

Over the last few years, there have been calls to examine user reactions to emerging innovative technology to focus on consumer behavior in pre-acceptance (Shaikh & Karjaluoto, 2015a) and post-acceptance (Shaikh et al. 2015a) of m-banking and other digital banking services and applications. These calls appeared particularly after emerging technologies such as 2.5G (i.e., GPRS), 2.75G (i.e., EDGE), and 3G wireless networks that supported faster and easier access to the Internet became increasingly ubiquitous. They thereby changed consumers' behavioral patterns in interacting with their financial institutions and service providers, as consumers became more technologically savvy than ever before (Luo et al., 2010).

In total, 152 scholarly publications, conference proceedings, book chapters, and popular market reports published over the last 15 years from January 2000 to December 2014 (inclusive), in the field of continuous usage and in the context of IS/IT, were included and divided into four major domains after considering the purpose, nature, and usage of the different IS/IT. This division within the information technology and systems continuous usage literature provides greater scalability, flexibility, and space for future research. This proposed division also allows for future research to include more "IS" in each domain,

depending on the usage, relevance, and nature of the IS that will evolve over a period of time. Scalability will provide more insights and ideas that will help future research investigate and propose domain-specific conceptual or business models that will help facilitate an understanding of IS/IT continuous usage according to the nature of the IS/IT.

This review identifies and presents 54 information technologies and systems classified into four broader domains: continuous usage of mobile information systems (CUMIS), continuous usage of electronic business information systems (CUEBIS), continuous usage of social information systems (CUSIS), and continuous usage of electronic learning information systems (CUELIS). This review yields several key findings, divided into four major subsections: major findings; domain-specific major findings; major models, theories, and frameworks used in IS/IT continuous usage; and major factors that influence human continuous behavioral intention, attitude, and use of IS/IT.

A synthesis of studies included in the CUMIS domain reveals a few key findings. For example, out of 43 studies that fall under this domain, 13 (or 33%) investigated m-Internet, and the lowest quantity of studies (i.e., one each) was conducted in the areas of m-ticketing, m-games, and m-government, thereby leaving ample opportunity for scholars to conduct further investigations into these research areas. Analysis of the geographic distribution of these papers showed that more than two-thirds (67%) were conducted in East Asia (China, South Korea, Hong Kong, and Taiwan), but no study on post-adoption within the systems included in this domain was conducted in Africa, the Middle East, or most of the South Asia region.

The second domain, CUEBIS, consists of several IS/IT, including ecommerce, e-shopping, enterprise resource planning systems, supply chain management, and Internet (online) banking. Out of 49 IS/IT included in this domain, the majority of the studies investigated e-shopping continuous intention and usage. A few analyzed e-government initiatives and online banking. In this domain, the lowest quantity of studies was conducted in the areas of supply chain management, web analytics, and online stock trading systems. The geographic distribution reveals an interesting scenario. More than half of the studies (51%) were conducted in East Asia (China, South Korea, Hong Kong, and Taiwan), and some were conducted in North America (18%) and the Middle East (6%). But no study within the systems included in this domain was conducted in Africa or South Asia (mainly comprising India, Pakistan, Bangladesh, Nepal, and Bhutan).

The third domain, CUSIS, included research carried out in the context of social networking sites/games, virtual/online worlds/communities, and so forth. Of the 31 studies included in this domain, more than half (58%) investigated human intention and the usage of different social networking sites (SNSs), notably Facebook, Cyworld, and Twitter. In addition, a few (19%) analyzed social virtual worlds such as Habbo and Second Life. Among the prominent SNSs, Facebook received most of the attention from the research

community. As a result, out of eighteen studies conducted on SNSs, 44% examined human behavior in using Facebook. Only one study was found on Twitter, and no scientific studies on other popular SNSs such as MySpace or Friendster were found. A large quantity of studies (68%) was conducted in the East Asia region comprised of China, South Korea, Hong Kong, and Taiwan. A few (16%) were conducted in Europe (Finland, Spain, Netherlands, and the U.K.), and three (10%) were conducted in the USA. Notably, no study was conducted on CUSIS in regions such as Southeast Asia, South Asia, Africa, Pacific Island countries (Australia, New Zealand), or the Middle East, which comprise several important emerging markets such as India and South Africa.

The fourth and last domain, CUELIS, is largely dominated by online, Internet, and web-based learning IS, tools, and applications. Only one study investigated student IS, learning management systems/Moodle, electronic courseware, and electronic textbooks/e-texts. Demographically, a large quantity of studies was conducted in Taiwan (38%) and the USA (24%). Two each were conducted in China and Hong Kong. A few studies were also conducted in Europe (Norway, Finland, and Spain), but no study was conducted in Africa, the Middle East, or South Asian countries.

These domains conclusively revealed a few significant, highly interesting and useful findings for future research, which will be discussed in detail in chapter 5. Nevertheless, it is pertinent here to mention that the research on post-adoption in the context of IS/IT conducted in the last two decades is unbalanced. A few geographic regions and systems dominate the investigation criteria, and a few others have been either completely overlooked or ignored. Despite the increased attention from peer-reviewed publications, conference proceedings, and popular market reports, there is still no holistic understanding of many IS, including the concepts of m-banking, Internet banking, web-based learning, electronic learning, and online learning.

## 4.2 Article 2: M-banking adoption: A literature review

As stated earlier in article 1, scholarship in the broader field of IS/IT has categorized research into four major domains. The first domain represents the adoption, pre-acceptance, or first use of a product or service. In the banking context, however, this also represents the adoption of banking channels such as ATMs, mobile, and Internet.

The findings of this study provided a holistic view of the antecedents enticing consumers when choosing m-banking services to conduct banking transactions. After all, without consumer acceptance, services do not sell, and revenues do not materialize. This has motivated banking companies to maximize customer relationships. Customer relationship phenomena include luring customers toward products and services, managing them, and monitoring their behavior.

This study explores and identifies several alternative delivery channels such as automated teller machines (ATMs), the Internet, the telephone, Point of Sale (POS), and convenient mobile delivery of financial and nonfinancial services to consumers. Over the last two decades, m-banking has emerged as an important distribution channel.

Another intriguing finding of this study is the identification and categorization of access devices used to conduct banking transactions using different channels. For m-banking services, cell phones and tablets are considered the primary devices for accessing m-banking services. For Internet banking, personal computers and laptops occupy that important position.

About the antecedents of m-banking services, this literature review provides valuable findings, prompting some notable implications for the research and the industry. For instance, over 80 antecedents of m-banking service adoption were identified and listed that, to some degree, influence the consumer attitude, behavior, and intention toward the initial acceptance of the m-banking services globally. In particular, three main dependent variables (attitude, intention, and usage) and eight independent variables (perceived ease of use, perceived usefulness, trust, social influence, perceived risk, perceived behavioral control or self-efficacy, compatibility with lifestyle and device, and facilitating conditions) emerged from this review. These contributions constitute the main research stream.

The meta-analysis of average (means) path coefficients between the antecedents of m-banking and attitude and intention, however, reveals that the compatibility (with lifestyle and device), perceived usefulness, and attitude appear to be the most significant drivers of the intention to adopt m-banking services in developed and developing countries. The m-banking adoption literature commonly relies on the technology acceptance model (TAM) and its modifications as well as the innovation diffusion theory (IDT) and the unified theory of acceptance and use of technology (UTAUT). However, in total, 11 technological and social psychological adoption theories, models, and frameworks were identified that provided the foundation for investigations of the consumer adoption of m-banking services.

Of the 55 studies included in this review, quantitative research was the most popular method used to collect and analyze the data. More specifically, out of these 55 studies, 45 (82%) used a quantitative (survey) method to collect data, three (5%) employed qualitative methods such as interviews, five studies (9%) used both qualitative and quantitative methods, and two studies were conceptual in nature. Among the most frequently investigated regions were Southeast Asia (e.g., Malaysia and Singapore), East Asia (e.g., Taiwan, China, and Korea), and Africa (e.g., Ghana, Zimbabwe, and South Africa); a few studies applied to Europe (Finland, Germany, and Turkey) and South Asia (India). The geographic distribution reveals that of these 55 studies, nine (16%) were conducted in developed countries, and the remaining 46 (84%) in emerging and developing countries.

Considering the plethora of m-banking services provided on portable devices including cell phones and tablets, this article has divided these services into transactional (or financial) and nontransactional (nonfinancial) in order to better understand the scope of these services. For instance, major transactional services include funds transfer both intra- and inter-bank and payment of utility bills. Nontransactional services include balance enquiries or finding locations of the ATMs.

In summation, this literature review, which is published in an ISI index and JUFO1 Elsevier Journal, provides a review of literature on m-banking adoption published from January 2005 to March 2014 (inclusive). The 55 relevant studies included in this review appeared in 48 peer-reviewed journals and seven conference proceedings and represent a reasonably deep view of the field of m-banking acceptance research.

## 4.3 Article 3: M-banking services continuous usage: Case study of Finland

Over the past three decades, Finland has achieved a position of distinction in being the pioneer European Union (EU) member country that has steadily developed and deployed innovative digital banking products and services as well as using new IS such as m-banking. Since the beginning of m-banking services in Finland during the mid-1990s, various alternative points of access have been offered to consumers to access their banking information using cell phones and tablets. These include m-banking through SMS and WAP phone banking. According to Laukkanen and Lauronen (2005), the first m-banking application in Finland was developed and offered by Merita Nordbanken (currently Nordea).

The underlying purpose of this study is to examine a set of post-adoption consequences that influence users' decision-making process when they choose to continuously use m-banking services in Finland. To guide this effort, a literature-based theoretical model based on the antecedents "self-congruence," "perceived risk," "perceived value," "continuous usage," and "word of mouth" was developed and tested. In addition, controls for the effects of gender, age, income, and usage share were used. Finally, this study also assessed the indirect effects of frequency and experience on m-banking use.

The demographic profile of the study participants shows that 53% of the respondents were female and 47% were male. Regarding age, 28.9% were between 35 and 49 years, and 25.6% were between the ages of 50 and 64 years. Over half of the respondents (62%) had an individual monthly gross income of 2001 to 6000 Euros. The sample represents quite well the Finnish adult population in terms of gender (51% are female), age (35–49: 19%; 50–64: 21%), and income (average income 2330 Euros) (Statistics Finland, 2014).

The findings of the study suggested that the antecedent "self-congruence" is significantly related to "perceived value" (PEVA). This finding addresses a critical gap in the extant literature, which does not seem to have analyzed the effect of self-congruence on m-banking continuous usage. Earlier, Kressmann et al. (2006) analyzed the relationship between self-congruence and brand loyalty in the context of consumer goods (automobiles), and the results of this study documented the paramount importance of self-congruity in predicting brand loyalty. Jamal and Goode (2001) found that self-congruence is a very strong predicator of consumers' brand preferences and a good predicator of consumer satisfaction. Kwak and Kang (2009) found that self-congruence and perceived quality had a direct positive effect on consumer purchase intentions.

In addition to self-congruence, this study examines the relationship between the perceived risk of m-banking service usage and the perceived value and found a significant but moderate relationship between them. This implies that the higher the risk, the less will be the perceived value a consumer can derive from using m-banking services. In other words, a growing perceived risk will erode the value or benefits and will discourage the consumer from using m-banking services for a longer period of time and, therefore, will motivate discontinuation. Similar to this finding, prior research (e.g., Chang & Tseng, 2013) has also viewed perceived risk as an antecedent that directly and negatively influences PEVA and purchase intentions.

This study also hypothesized and tested the direct relationship between perceived value and continuous usage intention, finding that PEVA was a significant antecedent of the intention to use for consumers in a developed market. The result confirms that perceived value influences consumer USE intentions toward m-banking. It means that the higher the user value, the stronger will be the relationship as well as the future usage of the m-banking services. In addition to the m-banking, a strong relationship between perceived value and continuous usage behavior was also found in other IS such as social networking sites (Al-Debei, Al-Lozi, & Papazafeiropoulou, 2013), e-learning systems (Chang, 2013), and online banking (Vatanasombut, Igbaria, Stylianou, & Rodgers, 2008).

The relationship between word of mouth (also known as recommendation intention) and the continuous usage of m-banking was also examined. The data analysis revealed the critical influence of continuous usage on word of mouth. This finding was expected, because the convenience and ease of use of m-banking services allow consumers to access banking information more easily, which increases consumer satisfaction and thus contributes to positive word of mouth and customer retention. This finding is especially relevant for the financial sector, because according to Casaló, Flavián, & Guinalíu (2008), a 5% improvement in customer retention can generate an 85% increase in service provider profitability.

In addition to these direct relationships, the moderating effect of frequency and experience on the relationship between the perceived value and continuous usage was also examined. The frequency with which users accessed

their m-banking applications was significantly and positively associated with the extent to which perceived value predicted continuous use. This study found that the moderating effect of frequency of use of m-banking services on the relationship between perceived value and continuous use was stronger than the moderating effect of experience. Finally, the moderating effect of experience on the relationship between perceived value and continuous use was negative.

## 4.4 Article 4: Continuous m-banking usage and relationship commitment: A multi-country assessment

This study examines and compares the consequences of m-banking services in a developed country (Finland) and in an emerging country (South Africa) from a relationship commitment (RC) perspective. RC is similar to the construct "trust" and is considered one of the most important variables for understanding the strength of a marketing relationship as well as for predicting future purchase frequency (Wong & Sohal, 2002).

The study findings reveal that the main motivation for continuous usage is convenience. The findings also reveal that consumer perceptions of their commitment to the management of their personal finances have changed due to the utilization of m-banking services. Overall, the results indicate positive changes in bank customers' commitment after using m-banking services in both Finland and South Africa. Earlier, in the context of Internet banking, Kassim and Kader (2006) found that trust and attraction have a significant positive impact on relationship commitment, with communication representing an important determinant of attraction and having a significant positive relationship with both trust and attraction. Similarly, RC and trust were found to be central to IS continuance usage intention and to the perceived empowerment influenced relationship commitment, while perceived security influenced trust (Vatanasombut et al., 2008).

## 4.5 Summary and conclusion

One of the profoundly interesting developments of the past three decades has been the digitization of financial services and products and the arrival of mobile telephony. Mobile and branchless banking services, added latterly to the digital banking portfolio, have revolutionized the banking services landscape, increased the outreach of retail banking, and allowed anytime anywhere banking and payment services to consumers on their portable devices—commonly, but not exclusively, cell phones, smartphones and tablets—to initiate an electronic transaction.

The four articles included in this dissertation provide a holistic view of m-banking services, m-banking products, and m-banking applications. In the backdrop of burgeoning competition where consumers have more choices than ever before, financial services firms including banks collaboration with other firms such as telecom and quickly growing FinTech are developing and deploying new methods of interacting with the consumers, mainly to increase the outreach of the banking services (also known as financial inclusion), reduce costs, and gain market share.

Considering the significance of m-banking, during the year 2016, some renowned journals such as *Marketing Science*, *Journal of Interactive Marketing*, and *International Journal of Bank Marketing* devoted special issues, respectively, to mobile technology, mobile marketing, and m-banking. One significant conceptual hurdle involved how to best describe m-banking and how it is considered different from other closely related digital banking channels such as Internet banking and branchless banking.

There could be several reasons which could drive consumer behavior toward the acceptance and usage of banking services and dedicated applications. These four articles have analyzed, defined, and identified several antecedents and outcomes of consumer m-banking services and application acceptance and usage. For instance, the most significant drivers of intentions to adopt and continuously use m-banking services in developed, emerging, and developing countries appeared to be the following: consumer convenience, consumer satisfaction, m-banking compatibility (with lifestyle and device) of the consumer, the perceived usefulness of m-banking services, consumer self-congruence, the perceived risk of using m-banking services or applications, the perceived value derived from using m-banking services or applications, word of mouth, and attitude.

# 5 IMPLICATIONS, CONTRIBUTIONS, LIMITATIONS, AND FUTURE RESEARCH DIRECTIONS

The IS field in general and m-banking in particular have made significant progress over the past few decades. M-banking seems to be emerging as a separate research stream after considering its massive growth, acceptance, and usage across different regions of the world. In particular, with regard to m-banking, a considerable diversity in research aims has been observed in terms of m-banking services and technology acceptance and usage. For instance, distinguishing m-banking services from m-banking technology (i.e., downloadable applications) is paramount to understanding consumer behavior in different market settings. M-banking services largely accessed using the SMS banking model provide limited functionality and service scope. On the other hand, m-banking applications downloaded onto cell phones and tablets provide huge practical implications, greater service scope, access to enhance banking functionalities, and improved security.

Although the empirical observations in this dissertation are limited to one service industry (m-banking), the conclusions and implications of this dissertation are valuable as well as informative beyond the m-banking channel and are beneficial for several digital banking channels. This is because, as argued by Barras (1990), the banking and financial sector is often considered the vanguard of service innovation and deployment. In light of these arguments, I believe that the implications and findings of this dissertation are relevant to other industries in which the IS is similarly pervasive (Van der Boor, Oliveira, & Veloso, 2014).

This chapter provides a detailed overview of the contributions made by this dissertation. These contributions are theoretical, and practical. Finally, the chapter also provides a plethora of future research opportunities that arise out of the research limitations identified and discussed in these chapter sections.

## 5.1 Contributions to theory and practice

As stated earlier, the underlying purpose of this article-based dissertation is to obtain an understanding of m-banking services and technology. Its goal is to investigate consumers' attitudes to m-banking adoption and usage, to offer a historical interpretation of m-banking technology and services, and to contribute to an understanding of two important research streams—the pre-adoption and post-adoption of m-banking applications and services at a single level of analysis (i.e., the individual level). Finally, the goal of this dissertation is to provide valuable insights into the consumer attitude and behavior toward banks and other financial service companies such as microfinance institutions to help these institutions fine-tune their m-banking strategies and offerings.

The single-level perspective advanced in this dissertation offers rich opportunities for methodical, theoretical, and practical insights and suggests a new foundation for in-depth research on the nature of m-banking adoption and continuous usage, its emergence and change, and its antecedents and consequences (Burton-Jones & Gallivan, 2007). The dissertation also provides an in-depth perspective on the trends in m-banking concerning its adoption, usage, demographics, and regional variations. In addition to pre-adoption and post-adoption, other research streams identified in the literature include consumer resistance to IS pre-adoption (e.g., Laukkanen et al., 2009) and consumer pre- and post-adoption of IS (e.g., Thulani, Kosmas, Collins, & Lloyd, 2011). Two major literature reviews were conducted and included in this dissertation (Articles 1 and 2), followed by one survey study (Article 3). Finally, Article 4 included in this dissertation discusses and compares m-banking usage in a developed and in an emerging country.

The purpose of this chapter is to summarize the discussion, categorize the implications, identify limitations, and offer future research possibilities in light of the research questions identified earlier.

### 5.1.1 Theoretical implications

I have attempted to provide a thorough introduction to IS, m-banking and their antecedents and consequences in both developed and emerging countries. Therefore, this research contributes to discussion in the marketing (consumer behavior) and IS fields (m-banking) regarding the different antecedents and outcomes influence consumers' behavior in accepting and then continuously using m-banking services and applications in their daily lives. The articles included in this dissertation were exposed to a peer-review process before their publication, which provides strong evidence to substantiate the claim that these studies have made contributions to knowledge.

This dissertation has examined prior research in the broader areas of consumer behavior in the context of IS, m-banking and has convinced me that the integration of ideas across the various strands of research via a common theoretical lens was not only a unique approach but also one that would likely

yield the greatest contribution to knowledge (Melville et al., 2004). The contributions to knowledge mainly include the methodological and theoretical contributions derived from this dissertation work; these are discussed below as well as summarizes in Table 4.

TABLE 4 Summary of key theoretical implications

| Article | Research Stream | Key Theoretical Implications |
|---|---|---|
| 1 | Continuous usage *(IS/IT)* | This review advances the literature on IS/IT usage and provides new insights and a comprehensive understanding of IS/IT usage by way of summarizing, synthesizing, and segregating the plethora of past studies.<br><br>This review identifies and discusses the main theoretical frameworks that have been used in IS/IT research to predict users' continuous usage intention and behavior.<br><br>It proposes a theoretical (or conceptual) framework consisting of four major domains that help to classify the existing massive and largely separate IS/IT literature into four major domains in order to understand past literature.<br><br>This literature review offers future research advice regarding which directions the research should go in order to create a more in-depth understanding of the drivers or consequences of continuous usage intention. |
| 2 | Pre-adoption *(M-banking services and technology)* | This literature review identifies, summarizes, and synthesizes the factors and relative strengths main of the main theories used to predict pre-adoption or the acceptance of m-banking applications and services. Consequently, this literature review will help future researchers to identify less used but useful alternative theoretical and methodological perspectives when considering m-banking.<br><br>This literature review also identifies the fact that the literature on m-banking adoption is fragmented and that it commonly relies on the technology acceptance model and its modifications.<br><br>This literature review identifies the most significant drivers or independent variables of the intention to adopt m-banking services in developed and developing countries. These drivers include m-banking compatibility (with lifestyle and devices), m-banking perceived usefulness, and consumer attitude toward the adoption of m-banking services and technology.<br><br>The dependent variables identified as prominent in investigations of the consumer decision-making process for m-banking include "attitude" and "intention."<br><br>Finally, this literature review suggests that prior literature is limited by its narrow focus on SMS banking in developing countries, while virtually no studies address the use of m-banking applications via smartphones or tablets or consider the consequences of such usage. |
| 3 | Continuous usage (*M-Banking*) | The underlying purpose of this study is to develop and test a conceptual model to improve the understanding of the consequences of continuous |

| | | |
|---|---|---|
| | | usage of m-banking services in a mature market.<br><br>The theoretical model proposed in this paper appears to be the first to examine the direct and indirect effects of self-congruence, perceived risk, perceived value, frequency, and experience on continuous use intention and the effects of continuous intention on word of mouth.<br><br>This paper contributes to current theory by assessing the effects of self-congruence on m-banking adoption. Similarly, the finding that self-congruence is significantly related to perceived value addresses a critical gap in the extant literature, which does not seem to have analyzed the effect of self-congruence on m-banking continuous use.<br><br>Finally, this study finds a significant but moderate relationship between perceived risk and perceived value, where m-banking users in developed countries focus on the obvious benefits of using m-banking services rather than on m-banking security issues. |
| 4 | Continuous usage (*M-Banking / Multicounty assessment*) | This study contributes to the theory of m-banking continuous use by providing insights into the drivers of continuous usage of m-banking services in a developed (Finland) and in an emerging market (South Africa).<br><br>This research broadens the understanding of continuous usage of m-banking services in a developed country and in the context of antecedent "relationship commitment."<br><br>This study sheds light on m-banking users' continuous usage behavior by addressing the issue of how the use of the mobile channel in retail banking affects the customer–bank relationship from a commitment perspective.<br><br>This study reveals that consumer perceptions of their commitment to the management of their personal finances have changed due to the utilization of m-banking services. Overall, the results indicate positive changes in bank customers' commitment after using m-banking services.<br><br>More generally, security and convenience have been identified as the key drivers for the growth of m-commerce, of which m-banking is an integral component. |

As with other emerging fields, the lack of theoretical progress in digital banking including m-banking, is not surprising. Previous research in the broader area of IS/IT acceptance and adoption has lacked a clear road map or agenda and is highly fragmented. Research on m-banking is less useful unless it is systematically collected, analyzed, and synthesized to accelerate the development of a research field for the benefit of both research and practice. Thus, a literature review on m-banking adoption represents an important milestone.

Following these arguments, and especially with regard to this dissertation, the literature reviews on IS/IT post-adoption (Article 1) and m-banking pre-

adoption (Article 2), which were published in peer-reviewed journals, contribute to how the previous research has considered and analyzed consumer pre-adoption and post-adoption behavior in accepting and using m-banking services, technology, and other popular IS. In doing so, Articles 1 and 2 presents a detailed review of the past scientific literature. The reason for this is that the IS/IT field has long been considered interdisciplinary having several branches and research streams integrating different disciplines such as social sciences, management sciences, and information sciences. This integration provides new directions and research possibilities for the scholarship.

This dissertation contributes to the existing work on consumer behavior in IS/IT and m-banking and, therefore, has expanded to examine effective consumer behavior in adopting and then using the IS/IT and m-banking services and applications in both developed and emerging markets. In this vein, and in order to make some valuable contributions to theory, some important research questions were raised and included in this dissertation, describing the motivation for and the directions of this dissertation. Among these RQs, RQ1 (What are the main theoretical frameworks in IS/IT research used to predict users' continuous usage intention and behavior?) and RQ2 (In the light of the literature, what are the factors and relative strengths of the main theories used to predict the adoption of mobile banking?) form the basis for conducting literature reviews to address these research questions. These questions provide a vibrant, comprehensive, and theoretically anchored framework (Article 1) as well as suggesting valuable implications for the theory industry. In addition, these articles (Article 1 and 2) introduce some hot topics, particularly in m-banking and generally in digital banking, for future research.

For researchers, Article 1 has proposed a theoretical (or conceptual) framework that serves three major purposes: to classify the existing massive and largely separate IS/IT literature, to understand past literature, and to guide future research. Prior research (e.g., Rocco & Plakhotnik, 2009) has used the terms "literature review," "theoretical framework," and "conceptual framework" interchangeably, and these three terms are sometimes considered components of a manuscript and sometimes as types of manuscripts. By virtue of the nature of its application, a theoretical framework is highly desirable for the research for several reasons. According to Merriam and Simpson (2000), an illustrated theoretical framework shares five major functions: (1) to build a foundation, (2) to demonstrate how a study advances knowledge, (3) to conceptualize the study, (4) to assess research design and instrumentation, and (5) to provide a reference point for the interpretation of findings. Rocco and Plakhotnik (2009) clarified that although these five functions are not necessarily fulfilled by the review or framework in each study, they often are.

The theoretical framework as illustrated in Article 1 does fulfill some of these conditions. First, to build a solid foundation, the theoretical framework included in Article 1 categorizes the plethora of research in IS/IT and specifically in mobile technology into four major domains, each with its own distinctive significance and necessity. Secondly, this division within the IS/IT

literature provides greater scalability, flexibility, and space for future research (Shaikh & Karjaluoto, 2015b). Third, this proposed division allows future research to include more systems in each category, depending upon the usage, relevance, and nature of the systems that will evolve over time (Shaikh & Karjaluoto, 2015b). Fourth, scalability will provide more insights and ideas to help future studies investigate and propose domain-specific conceptual or business models that will help create an understanding of IS/IT continuous usage according to the nature of the system (Shaikh & Karjaluoto, 2015b).

The second literature review (Article 2) reflects that ATMs and POS terminals, telephone and call centers, Internet and mobile, branchless and Omni channels, and more recently, mobile wallets are among the most preferred, widely used, and exceedingly recognized delivery channels developed and offered by banking institutions around the globe. A few of these channels, such as m-banking and branchless banking, are developed, offered, and managed in collaboration with nonbanking firms such as FinTech, telecom companies, microfinance institutions, and so forth. M-banking, added latterly into the delivery channel portfolio, is considered important for various reasons. For instance, unlike other banking channels such as ATMs and the Internet, which allow high-value transactions, m-banking relies on mobile devices such as cell phones and tablets to access banking information and conduct low-value transactions. Compared with Internet banking services, m-banking is free of temporal and spatial constraints. That is, m-banking users can acquire real-time account information and make payments anytime and anywhere (Zhou et al., 2010).

Compared with the complex interfaces of online banking providing many functions, m-banking has fewer functions and clearer interfaces (Zhou et al., 2010). Unlike traditional phone-banking or tele-banking (in a few cases also known as call center banking and interactive voice response (IVR) banking), which offer very limited functions such as check balancing and fund transfer, m-banking is evolving into a rich platform for automated banking and other financial services (Kim et al., 2009).

Unlike the two literature reviews, Article 3 provides a survey study on the usage of m-banking services in Finland and addresses RQ3 (How does the perceived value of m-banking application use affect continuous usage and positive word of mouth?) in the context of a mature market, in this case, Finland. The underlying purpose in undertaking this study and including it in the dissertation is to examine a host of antecedents that motivate consumers to embrace m-banking and develop long-term relationships with the banks and service providers. The reason is that financial institutions must offer online, m-banking, and other digital services to be competitive, so it is therefore essential to identify the consumers who are likely to adopt m-banking services and the extent to which their continuous usage of these services might change (Shaikh & Karjaluoto, 2016b).

To address RQ3, this study was conducted with 273 digital banking users in Finland. A survey research technique was used to solicit responses from

consumers who had been in relationship to a bank—that is, maintaining a formal bank account and using m-banking services for the previous six months, at minimum, either on their cell phones or tablets. In order to search for and identify relevant consumers for this survey, a professional marketing research firm was hired to fill in the questionnaire with the target consumers.

A theoretical model was developed and tested that explained the sustained use of m-banking and proposed that self-congruence and perceived risk had a direct effect on perceived value, which was hypothesized to positively affect the continuous usage of m-banking. In the model, perceived value mediates the effects of self-congruence and perceived risk on continuous usage. The model also proposes that continuous usage eventually produces positive word of mouth.

For researchers, this study examines the effects of some major consequences (self-congruence, perceived risk, perceived value, word of mouth) that have been examined, tested, and suggested to influence technology usage behavior in a new integrated m-banking technology environment. Another valuable theoretical contribution is that the findings of this study reconfirm results of previous studies, address a critical gap in the m-banking literature, and also demonstrate that among all the variables used in this study, consumer usage behavior is a critical influence on word of mouth. This study also confirms the direct and positive relationship between self-congruence and perceived value when using m-banking technology. Earlier, a similar relationship between self-congruence and perceived value was recorded in the tourism/cruise ship (Hosany & Martin, 2012) and automobile sectors (Jamal & Goode, 2001). This study finds a significant but moderate relationship between perceived risk and perceived value, which is consistent with the findings reported by Chen (2012) and which partially supports the results reported by Hsu and Chiu (2004) and Chen and Chen (2009).

This article 4 looks at the usage of m-banking services in two different markets and addresses one broader research question, that is, how m-banking services usage is different in a developed market and in an emerging market, and addresses RQ4 (What kind of meanings do experienced m-banking application users give to their m-banking use in the light of their customer relationship development with their banks?).

Considering the emerging nature of m-banking services, a qualitative research approach using face-to-face in-depth semi-structured interviews was chosen. The interviews were also chosen as the primary data collection method, as they would provide a deeper understanding of the phenomenon, and previous research has demonstrated the feasibility of such interviews in studying innovative mobile services (Jarvenpaa & Lang, 2005). In total, 36 in-depth interviews were conducted with experienced m-banking users, including professionals and students, in the cities of Jyväskylä (Finland) and Johannesburg (South Africa). A purposeful sampling technique was used in which the participants were selected according to the needs of the study (Morse, 1991, p. 129), in our case, on the basis of their m-banking experience (minimum

6 months). Thus, this sample has the ability to contribute to the theoretical understanding of the subject of the study (Bryman & Bell, 2011, p. 500). Interviews were conducted in a semi-structured format that allowed participants to express their own viewpoints. However, the research has not endorsed interviews conducted using the Skype IP telephony service for a face-to-face interview.

The academic contributions of this study are twofold. First, this study contributes to the theory of m-banking continuous use by showing insights into the drivers of continuous usage of m-banking services in a developed and in an emerging market by addressing the issue of how the use of the mobile channel in retail banking affects the customer–bank relationship from a commitment perspective (Shaikh et al., 2015a).

Secondly, this study finds that the main motivation for continuous usage in both markets is convenience. In addition to a difference in the markets, previous research (e.g., Laukkanen, 2007) has established the importance of convenience along with efficiency and safety when determining the differences in customer value perceptions between different banking channels such as Internet and m-banking. More generally, security and convenience have been identified as the key drivers for the growth of m-commerce (Mallat, Rossi, & Tuunainen, 2004), of which m-banking is an integral component.

The findings reveal positive changes in bank customers' commitment after using m-banking services, which implies that the m-banking services have increased the customer relationship commitment with the bank. Earlier, Aurier and N'Goala (2010) examined how service companies such as banks can effectively influence customer patronage behaviors by leveraging overall customer satisfaction, trust, and relationship commitment. Aurier and N'Goala concluded that relationship commitment enhances customer retention and exclusivity.

### 5.1.2 Practical implications

For much of the past three decades, examinations of pre-acceptance or adoption antecedents were dominated by previous research. These antecedents provide valuable input to marketing and other decision makers in a firm understanding of how consumers can be attracted to a service or technology. However, retaining a consumer for a longer period of time is the ultimate aim and object of every marketing and business strategy. Considering the research aim and scope, this dissertation provides an important discussion of how to attract (pre-adoption) and retain (post-adoption) a consumer and what the consequences are that could possibly influence the consumer decision-making process toward the usage of m-banking services and technology. Here the underlying assumption is that understanding consumer needs and attitudes provides several benefits to companies, for example, helping them to sell more, to increase revenue, and to develop more stable and long-lasting relationships.

One of the major practical contributions of this dissertation is its detailed exposure to m-banking services and technology. However, other key

implications of consumer behavior and marketing communication in the context of m-banking adoption and usage are discussed below.

First, being inherently independent of time and place, and after considering the exponential growth in the usage of cell phones and tablets for conducting online transactions, the financial services companies (including banks) should consider m-banking a vital new banking delivery channel separate from its rivals such as branch banking, Internet banking, ATM banking, and, lately, branchless banking. This suggests that all players in the field, including banking and nonbanking institutions (such as the telecom sector), should take the development of m-banking services seriously (Shaikh et al., 2015a). Unlike branch banking, m-banking services help banks to reduce the costs of banking services and play an important role by providing a way to overcome physical distance and financial exclusion, especially in the case of developing and emerging markets (Baptista & Oliveira, 2015).

Second, for the industry, it is highly desirable to understand what causes consumers to accept or reject new innovative services such as m-banking. After synthesizing an extensive collection of empirical studies, this dissertation has identified several key factors considered by users when accepting or pre-adopting m-banking services. The financial services companies can control these factors or variables to lure consumers toward mobile-based services as well as to retain them. In particular, eight variables (perceived ease of use, perceived usefulness, trust, social influence, perceived risk, self-efficacy, compatibility with lifestyle and device, and facilitating conditions) provide a vital stimulus and are considered to be the most significant drivers of attitude and intention to adopt m-banking services in developed and emerging countries.

Third, among these eight major variables, the usability of innovative technology-based services has been the core antecedent of prior IS and marketing studies as well as a core function of adoption models used in previous studies (Kang, Lee, & Lee, 2012). Perceived ease of use and perceived usefulness are the two key antecedents of the much publicized and extensively used technology acceptance model (TAM) proposed by Davis (1989), which later underwent substantial replication, refinement, and extension (Van der Heijden, 2004). Perceived ease of use is defined as "the extent to which a service or technology is perceived as being easy to understand and use." It is widely believed that the perceived ease of use of a service or technology has the potential of affecting consumer adoption intention directly as well as indirectly via perceived usefulness (Kang et al., 2012; Wu & Wang, 2005). Perceived usefulness is defined here as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). Of course, companies need to understand the consumers' needs and requirements by offering them more pliable services for their everyday use.

Fourth, given the high level of uncertainty involved in online transactions such as those conducted on the Internet and on cell phones using SMS, WAP, or a dedicated m-banking application, financial services companies should

understand that there could be many reasons to believe that m-banking services are highly risky. These reasons include:

- the increased use of Internet and mobile telephony to share information and conduct transitions online;
- control of unreliable and inefficiently regulated third-parties managing the development, deployment, and security of the m-banking applications;
- readily available hacking tools; and
- exorbitant increases in intruder attempts both in numbers and complexity.

Consequently, extensive research (e.g., Shaikh et al., 2015b; Kang et al., 2012) has considered consumer information security (including both personal and banking information) as one of the greatest concerns in the adoption of m-banking in several countries around the globe. In contrast, some researchers (e.g., Laukkanen & Lauronen, 2005; Laukkanen, 2007) have disagreed with this proposition and have concluded that m-banking users are generally not concerned about security issues. The reasons are that these users believe that m-banking applications are more secure than other digital banking channels such as Internet banking. Nevertheless, m-banking can become the most preferred delivery channel if banks address the safety, security, and privacy concerns of the consumers.

Fifth, the compatibility of m-banking services with the consumer lifestyle and devices provides greater implications for the industry. More specifically, considering the complex and heterogeneous digital banking technology, products, and services (Shaikh & Karjaluoto, 2015a), m-banking compatibility would increase adoption rates of m-banking services across the developed and emerging markets. According to Kim, Kim, and Kil, (2009), compatibility is the degree to which using an innovation is perceived as consistent with the existing sociocultural values and beliefs, past and present experiences, and needs of potential adopters. In contrast, the incompatibility of the service or technology with the potential adopters' values could hinder the adoption process. In summation, this explanation of compatibility implies that the personalization of digital services, considered a huge challenge that many financial services companies (including banks) are grappling with, would provide immense benefits to these companies. In other words, a one-size-fits-all approach will not produce fruitful results. The marketing strategy as well as the marketing communication channels should properly segment the consumers demographically, for instance, between men and women, rural and urban populations, or high and low incomes, in order to increase the adoption rates of m-banking services and technology.

One notable example is the Austrian bank Raiffeisen, which has introduced a tailored m-banking application for students (that is, the Raiffeisen Club) in addition to developing other tailored m-banking services to better

serve the needs of different customer segments (Shaikh et al., 2015a). Similarly, in Finland, the OP Bank introduced two separate mobile-based services tailored to the needs and requirements of its customers. These services include OP-Mobile and Pivo. OP-mobile is a utilitarian application developed to increase the consumer task performance while encouraging efficiency. On the other hand, Pivo (or m-wallet) is more hedonic in nature and is primarily meant to provide fun and a pleasurable experience. According to Hepola, Shaikh, and Karjaluoto (2016, in press), the Pivo application differs from the normal m-banking application because of its location sensitivity and shop-related information (including discount coupons).

Sixth, like every innovative development, the financial service companies should engage in inventive collaboration (Van der Boor et al., 2014) with different stakeholders, including consumers and other companies, during the early stages of developing m-banking services and applications. After all, one of the most profound sources of competitive advantage for the financial services sector is the ability to develop real-time, customer-infused strategy (Weber, 2011). I believe that inventive collaboration and engagement will be successful in both the developed and emerging countries, since banking technology is prevalent in both developed and emerging countries. More specifically, building a resourceful partnership network with consumers, start-ups, telecoms, and FinTech would deliver several benefits to financial services companies. For instance, the real-time feedback received from the consumers will save time and resources and will accelerate the development process. It will also increase the chances of a service being accepted and used by the consumers. It will help publicize the benefits or value proposition of m-banking services to customers during the development stage, will create valuable positive word of mouth, and will increase the market share and business revenue. In addition, one other profound benefit of partnership or collaboration is that it will build stakeholder trust in the service and the technology.

### 5.1.3 Implications for Finnish business environment

In the backdrop of growing digital interest in developing and offering mobile technology and services to the consumers, this research provides both a local and an international perspective and, therefore, will be significantly beneficial for the local Finnish business environment in different ways.

First, the findings of this dissertation will help the industry understand variant consumer behavior and the factors influencing consumer decisions toward accepting and continuously using m-banking services, with an underlying goal of providing a frictionless experience to customers, providing digital services in an effective and seamless way, attracting new consumers, retaining the existing consumer base, and growing the market share.

Second, prior research has investigated and identified various factors that influence the consumer decision journey toward accepting and using new technologies and services such as m-banking (see Table 5). For instance, Hepola et al. (in press) argued that for Finnish consumers, self-congruence (or self-

image congruence) is the main driver of the perceived value and that perceived value has strong positive effects on the development of bank–customer relationships. Therefore, understanding how customers perceive value in various service contexts can increase the quality of strategic decision making, leading to improved customer orientation (Laukkanen & Lauronen, 2005).

Third, Finland has one of the highest mobile penetrations in the European Union member countries, but not in m-banking adoption and usage. This dissertation has placed great importance on and has identified the vital need to create awareness about the advantages, benefits, and data security of m-banking services and the technology (applications) among potential and present users. Because of a lack of appropriate and sufficient awareness about the services and technology, digital-savvy consumers in Finland may become reluctant to accept and use the m-based financial service. The financial services industry should understand that in this recommendation-based digital economy, the tech-savvy consumers do online product research, make price comparisons, and make purchase decisions based on other customers' ratings (McKinsey & Company, 2013). Providing sufficient information and creating a deeper awareness of the service as well as of the technical capabilities of m-banking is a prerequisite to the successful implementation, adoption, and usage of an IS such as m-banking.

Fourth, periodic marketing campaigns are sometimes useful in creating necessary information and creating awareness, but more recently, a good number of institutions including banks have been shifting their attention to live or always-on marketing and customer-outreach programs, in which financial service providers engage with always-on customers in exactly the right way at any delivery channel or contact point. As a result, in this digital age, these always-on marketing programs matter profoundly.

Fifth, because this dissertation has included a multi-country analysis of consumer behavior in a developed (Finland) and in an emerging country (South Africa), it will help the Finnish industry to better understand consumer behavior when expanding future operations into other regions of the world, thereby providing new business opportunities.

TABLE 5 Key factors influencing consumer behavior and attitude in adopting and using m-banking services and applications in Finland

| Citation | Key findings |
|---|---|
| Hepola et al. (*in press*) | • For Finnish consumers, self-congruence (or self-image congruence) is the main driver of the perceived value, and perceived value has strong positive effects on the development of bank-customer relationships. |
| Karjaluoto et al. (*in press*) | • This study examines how self-congruence and personal innovativeness are linked to consumer engagement. The results suggest that self-congruence positively influences all three types of consumer engagement:<br>➢ Personal innovativeness has a small effect on cognitive processing and affection,<br>➢ Affection and activation have a positive impact on continuous usage intention, and<br>➢ Perceived risk moderates the relationship between affection and continuous usage intention. |
| Shaikh and Karjaluoto (2016a) | • User satisfaction with m-banking applications in Finland has a strong positive association with m-banking application usage, that is, the greater the usage, the greater will be the satisfaction.<br>• Application usage was positively related to bank–customer relationship development in terms of increased commitment to the bank, increased behavioral intention to stay with the bank, and increased overall satisfaction with the bank.<br>• Surprisingly, no significant relationship was established between application usage and intention to recommend (or word of mouth). This indicates that m-banking application usage is independent of a customer's intention to recommend the bank to others. |
| Shaikh et al. (2015b) | • Trust in m-banking services plays a significant role in promoting continuous usage of m-banking services and technology in Finland.<br>• Convenience, user friendliness, and the speed of m-banking services emerged as the main subtopics related to the satisfaction of the consumer. In most cases, the convenience of using m-banking dominated the recommendation criteria in Finland. |
| Shaikh et al. (2015a) | • In addition to convenience of use, consumers in Finland consider freedom of location and time, user friendliness of the m-banking services, and the application very important.<br>• Another reason for using m-banking services identified in this study is improved control over the user's bank account.<br>• A majority of the respondents in Finland agreed that because of m-banking, their relationship commitment to their bank has |

| | |
|---|---|
| | increased. |
| Laukkanen and Pasanen (2008) | • Among Internet banking users in Finland, the user of m-banking services is older and largely falls within the age groups 30–39 and 40–49 years. |
| Laukkanen and Lauronen (2005) | • Although convenience and location-free access have been considered the main drivers of m-banking adoption, the keyboard and display size of mobile devices were considered difficult to use and thereby led to a feeling of inconvenience to consumers. |
| Suoranta and Mattila (2004) | • The most experienced customers of m-banking in Finland are more informed by interpersonal communication, whereas the less experienced and nonusers of m-banking are more informed by the mass media. Consequently, disseminating information through the right channel and in the right mode of communication for different consumer segments is likely to increase each segment's probability of adopting m-banking and other innovative services in Finland.<br>• Considering the demographic variables, the study found that the next segment of customers in Finland willing to adopt m-banking are those over 50 years old. In addition, the wealthier respondents in Finland were found to be less willing to adopt m-banking services. |

## 5.2 Limitations and future research avenues

Like most empirical research, this dissertation is not without limitations. The associated recommendations for future research have largely been derived from the directions, recommendations, and suggestions mentioned in the reviewed articles as well as from the analysis of the results of the studies included in this dissertation.

### 5.2.1 The role played by nonbanking sector in developing and providing m-banking services and technology

The literature included in this dissertation largely deals with the m-banking services and technology offered by the banking companies and ignores the role played by other nonbanking financial sectors in developing and deploying m-banking applications, either in collaboration or partnership with the banking companies or separately. For example, in many emerging and developing counties, the telecom sector has developed its own mobile payment model and allows mobile transactions by consumers. These models need to be included in future research, and their comparison with business models exclusively offered

by banking companies will provide valuable insights into marketing (consumer behavior) research. More specifically, exploring m-banking services and applications adoption from the perspective of service providers such as FinTech, software houses, or network carriers would be welcome.

### 5.2.2 M-Banking and m-payments

Although the acceptance or adoption of m-banking and its continuous usage is the core of this dissertation, m-banking and m-payments are considered two important components of mobile financial applications (Mallat et al., 2004). Future research should investigate the consumer behavior and the factors affecting the adoption and usage of m-payments. Any comparison between consumer adoption and usage behavior in m-banking and m-payments will provide useful information for research and for practice.

### 5.2.3 Business2business context

This dissertation has considered m-banking services and technology and examines the pre-adoption antecedents and post-adoption consequences in a business2consumer context, leaving other important aspects unattended. These aspects include m-banking infrastructure and innovation both from the business2consumer and from the business2business perspective. Similarly, significant differences in culture, economy, and banking systems could be considered in a cross-cultural study (Tran & Corner, 2016). Incorporating all these aspects of m-banking into future research and reviews would be useful for delineating the evolving digital banking channel.

### 5.2.4 Branchless banking

Branchless banking, a variant of m-banking, has appeared as a separate delivery channel, having its own business model, marketing strategy, and regulatory framework. The term "branchless banking" was first coined by the Consultative Group to Assist the Poor (CGAP 2010) to refer to a "new and innovative banking distribution channel that allow financial, banking institutions and other commercial actors to offer financial services outside traditional bank premises" (Dermish, Kneiding, Leishman, and Mas, 2011, p. 83). Here, access to formal banking services is recognized as one of the most important conditions to improve the economic activities as well as the chances of self-employed individuals living close to the poverty line and in remote areas (Abramovay, 2004). According to CGAP (2010), over 2.5 billion people in the world do not have access to formal banking and financial services, and yet one billion (or 40%) of them have a mobile phone. For instance, in the Philippines, mobile-subscriber penetration is almost 80%, but banking penetration is only around 35%, leaving 21 million mobile subscribers with no bank account (McKinsey & Company, 2010).

Branchless banking systems take advantage of increasingly ubiquitous real-time mobile communication networks to bring banking services into everyday retail stores, thereby alleviating the lack of banking infrastructure in communities where poor people live and work (Dermish et al., 2011). I encourage future research to consider taking these distinguishing aspects into account when investigating mobile-based financial services. The research questions that should be considered when investigating branchless banking include:

- What processes and contextual factors affect the consumer decision journey when adopting and using branchless banking?
- What characteristics differentiate earlier from later branchless banking adopters? and more generally
- How does branchless banking propel economic growth?

### 5.2.5 Longitudinal studies on m-banking

The sample collected to investigate the m-banking usage in Finland (Article 2) is representative of the Finnish population, but this approach, as argued by Karjaluoto et al. (in press), has a weakness in that the causal relationships of the existing model tested will not change over time and therefore might generate some muddles. Against this limitation, future research should adopt a longitudinal study design to examine the continuous usage of m-banking services and the technology in both developed and emerging markets. The underlying purpose to recommend a longitudinal study design for future research is largely based on my assumption that there will be a wider and more extensive usage of m-banking over time.

### 5.2.6 Demographic factors

Future work may consider testing and integrating the proposed research model, as depicted in Article 2, for older age groups with different working profiles. According to Tran and Corner (2016), older age groups tend to be late adopters or laggards in accepting IS/IT innovations in the financial sector. In addition, Article 2 utilized urban data collected from the city of Jyväskylä in Finland. Expanding the scope and implications of future research, I encourage a comparative analysis of data collected from rural and urban segments of the population in m-banking adoption and continuous usage.

### 5.2.7 Different research techniques

Seventh, the common method bias is always present to some extent in every survey study conducted at a single point in time that does not account for changes in the opinions of consumers at different times. Although the results of our common method bias test as well as the procedures followed in the design

of the survey and data collection indicated that CMB was not significant in our study (Karjaluoto et al., 2016, in press), future studies should take this into account by using different research techniques such as the experimental technique.

### 5.2.8 Users vs. nonusers

One important limitation is that the study sample is biased toward m-banking users rather than to nonusers. Here a survival bias may have crept into the research design, as nonusers or those who resist the continuous usage of m-banking were not included in the sample frame (Van der Heijden, 2004) due to the scope of the study, which focused on those who had been using m-banking over the previous six months. The same applies to hedonic and utilitarian IS, whose acceptance and usage may follow different patterns between and among consumers. Therefore, it is recommended that future research investigate these issues in the context of m-banking as well as branchless banking.

### 5.2.9 Comparative/cross-cultural studies

Article 4 is exploratory (and qualitative) in nature and limited to a smaller sample size. Given that the sample does not represent the whole population of m-banking users, it will affect the generalizability of the results. However, in order to enhance the generalization, a comparison with different geographic locations, with a larger sample size (Tam & Oliveira, 2016), including different demographic factors such as age and extending across a variety of cultures, is welcome.

## 5.3 Summary and conclusion

Prior research (Shaikh & Karjaluoto, 2015a; Mattila et al., 2003) has endeavored to investigate and uncover underlying antecedents and consequences to digital banking channels such as Internet banking, ATM banking, and so forth. With the escalation of m-commerce and portable devices, understanding consumer behavior in m-banking services and applications adoption and usage is an increasingly important topic for researchers. Hence, of particular interest to this proposed study is the acceptance and continuous usage of m-banking services and technology, which has been cited as a fundamental managerial challenge in the successful implementation of m-banking. It is also widely recognized as a highly challenging task for banks and service providers to encourage customers to accept and continuously use m-banking as well as to attract new customers to the service (Shih, Hung, & Lin, 2010).

M-banking has received much attention from the banking industry and regulators. M-banking now appears to be the dominant banking channel, and its growth in several countries around the globe has been considered massive.

What is more surprising is that it is gradually replacing other banking channels and is eroding branch banking in the developed and most emerging countries. Yet in most emerging countries like South Africa, ATM banking is still the most preferred banking channel.

The findings of this study will provide several benefits to the bank management and service providers, for example, helping them to understand the consequences that influence consumer continuous usage of m-banking services rather than a one-time adoption of these services and helping the providers to recognize the importance and necessity of consumer retention during the post-adoption period in surviving business, increasing profits, and market share.

Several notable theoretical and managerial implications were identified and discussed in this dissertation. In spite of a few limitations, some meaningful future research directions were also recommended. The articles included in this dissertation were exposed to a peer-review process before their publication, which provides strong evidence to substantiate the claim that these studies have made a contribution to knowledge.

At the outset, two comprehensive literature reviews were conducted and included in this dissertation; these attempted to provide a detailed exposition of m-banking services, technology, and variant consumer behavior when accepting and using m-banking in both developed and emerging countries, followed by some useful theoretical and practical implications.

In summation, the underlying purpose of those implications is that although some companies including the banking companies can tackle major innovations such as m-banking themselves, a network organization can utilize the knowledge recourses, create new knowledge, and also sustain in the long run. Therefore, collaboration with other firms is paramount in this highly competitive environment when developing innovative products and services such as m-banking.

Especially for the Finnish banking industry, this dissertation identified several implications. For example, the findings of this dissertation will help the Finnish financial services sector understand digital consumer behavior and the factors influencing the consumer decision journey toward accepting and continuously using m-banking services, with the underlying requirement to provide frictionless experience to customers, provide digital services in an effective and seamless way, attract new consumers, retain their existing consumer base, and grow their market share.

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# ORIGINAL PAPERS

# I

## MAKING THE MOST OF INFORMATION TECHNOLOGY & SYSTEMS USAGE: A LITERATURE REVIEW, FRAMEWORK AND FUTURE RESEARCH AGENDA

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Literature Review

# Making the most of information technology & systems usage: A literature review, framework and future research agenda

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ABSTRACT

This detailed literature review has considered a relatively large quantity (152 total) of scholarly empirical publications, conference proceedings, books and popular market reports published over the last 15 years, i.e., from January 2000 to December 2014, in the field of human continuous usage behavior and in the context of information technology/systems. Based on the search results, the literature was synthesized, segregated into four major domains according to the purpose, nature and usage of the information technology/systems. The authors believe that this segregation within the information technology & systems continuous usage literature provides greater scalability, flexibility and space for future research. Moreover, this proposed segregation allows for future research to include more 'systems' in each category depending on the usage, relevance and nature of the 'systems' that will evolve over the period of time. Scalability will provide more insights and ideas that will help future research investigate and propose domain-specific conceptual or business models that will help facilitate an understanding of information technology/systems continuous usage according to the nature of the 'system.' Conclusions and recommendations are drawn and priorities are proposed for continuing research.



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## 1. Introduction

Extensive research (e.g., Norris, Pauli, & Bray, 2007; Shank, 2013) has sought to explore the ways in which society and human beings have been affected by information technology/systems (IT/S) and how the IT/S revolution has changed the way we conduct our lives as well as our behavior. IT/S are human-related systems; humans use IT/S to fulfill their personal goals and desires; and they design, develop and operate IT/S to control and manage organizations' information databases. Organizations have invested in a plethora of IT/S, and the benefits that can be gained from these systems depend on their usage. Consequently, the adoption and the usage of IT/S continue to be an important consideration for organizations. As explained by Bhattacherjee (2001a), acceptance (or pre-adoption) generally refers to an individual's decision to use IT/S for the first time; continuous usage (or post-adoption) refers to the individual's decision to embrace the IT/S well beyond its first use and continuously exploit and extend the functionality built into IT/S.

Available evidence (e.g., Jasperson, Carter, & Zmud, 2005; Venkatesh, Brown, Maruping, & Bala, 2008) supports these arguments and strongly suggests that most IT/S are underutilized; users, including consumer and employees, apply a narrow band of IT/S features; users rarely initiate extensions of the available IT/S features; and organizations underutilize the functional potentials of the majority of the currently developed and deployed IT/S. Consequently, understanding post-adoption human behavior intention has emerged as an important issue in IT/S research (e.g., Saeed & Abdinnour-Helm, 2011). Investments and innovations in IT/S illustrate this phenomenon. According to the 'Information Technology (IT) Spending Forecast' published by Gartner (2014), worldwide dollar-valued IT spending will grow 3.2% in 2014, reaching USD 3.8 trillion. The existing research has demonstrated that it costs approximately six times as much to recruit a new subscriber as it does to maintain an old one in paid membership contexts (Spiller, Vlasic, & Yetton, 2007). For example, in the case of Internet service providers (ISPs), an extra 1% retention can add as much as 5% to the bottom line of the business (Vatanasombut, Igbaria, Stylianou, & Rodgers, 2008). Furthermore, many e-commerce companies, particularly online retailers, have begun to realize that because their competitors are just a click away, retaining the company's customer base in addition to attracting new customers are critical for sustaining a revenue base, profitability and a market share (Bhattacherjee, 2001a). Researchers have been intrigued by these arguments, and the IT/S continuous usage intention has evolved as a key dependent variable in marketing and IS research (e.g., Limayem, Hirt, & Cheung, 2007) and many studies have empirically examined its determinants (e.g., Lu & Yang, 2014).

The use of IT/S across diverse fields and the reliance on IT/S for high-end, routine operations and common use is growing. Practitioners, researchers, and government alike have begun to pay attention to long-term or continuous IT/S usage, which is a topic that is often neglected (Verhagen, Feldberg, van den Hooff, Meents, & Merikivi, 2012). Nevertheless, ensuring the usage of information technology and communication resources in an organization is only one aspect of IT/S success, it is clearly one of the most important.

Against this background, this study seeks to contribute to the understanding of IT/S and strengthen 'information technology & systems continuous usage (IT/SCU)' as a field of study. To achieve this objective, this study has undertaken a detailed literature review by reviewing a relatively large quantity of studies to understand the continuous usage phenomenon and to help promote a higher utilization of IT/S across several organizations. In addition, this literature review aims to contribute to a better practical and theoretical understanding of the consequences that drive human behavioral intention towards embracing and using information technology and systems. Similarly, the authors understand that this study will significantly contribute to the IT/SCU literature by exploring and analyzing the current state of knowledge, including where excess research exists and where new research is needed; and providing a solid theoretical foundation for the proposed field of study (Levy & Ellis, 2006).

Another significant contribution of this literature review is the proposed classification framework consisting of four broader 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.

The focus of our review covers articles published over the last 15 years, i.e., from January 2000 to December 2014 (inclusive), in the leading academic journals and conference proceedings that examine IT/SCU. In addition, popular market reports, ideas, and relevant books that are commercially available have been included.

Within the context of this review, we use the broader term "information technology/systems" to refer to a set of systems, technologies, processes, business applications, and software. Similarly, a broader term "human" is used to denote the unit of analysis or a participant, which includes users, netizens, members, students, faculty members, consumers, customers, employees, workers, managers/executives, and so forth. Although with a different landscape as discussed in the succeeding sections, the terms 'review' and 'literature review' are used interchangeably in this study.

The paper proceeds as follows. The succeeding sections provide a brief explanation of information systems, their historical background (Section 2) and a brief overview of previous literature reviews written in this direction (Sections 3). The research methodology and theoretical framework are presented in Section 4. The classification framework is presented and illustrated in Section 5. The results of the study are presented and discussed in Section 6 along with a synopsis of theoretical and practical implications. The study concludes with a discussion of future research possibilities.

## 2. Evolution of information systems – Definition and historical perspective

> '*Computers have been considered as one of the most important inventions in the 20th century and the future technology trends exclusively emphasize enhancement in human–computer interaction*' (Wang & Nelson, 2014, p.82).

Given the myriad of definitions and dimensions used to describe information systems, the first challenge in conducting a detailed review of the prodigious range of information technologies and systems is arriving at an understanding of an IS and what is not considered an IS. Research has paid less attention to understanding the difference between an IS and the rest of the technology-based initiatives that cannot be considered an IS for

**Table 1**
A snapshot of the evolution of IT/S. *Source:* Hirschheim and Klein (2012), Power (2007), Ellison (2007) and Harper (2003).

| Era | Target technology/system |
|---|---|
| First Era 1960s | Transaction Processing Systems<br>Management Information Systems (MIS)<br>Ethernet<br>COBOL<br>3rd Generation Framework (IBM 360)<br>Database<br>Auto Teller Machines (ATMs) |
| Second Era 1970s | Decision Support Systems (DSS)<br>Minicomputers<br>Mid-range Computers<br>Computer Mouse<br>Personal Computers<br>Electronic Data Interchange<br>E-Business (including E-Commerce) |
| Third Era 1980s | Enterprise Resource Planning (ERP) Systems<br>Executive Information Systems<br>Expert Systems<br>Knowledge Management Systems<br>Internet Banking<br>Mobile Technology<br>Radio-Frequency Identification (RFID)<br>Global System for Mobile Communications (GSM) |
| Forth Era 1990s | Ubiquitous computing (including Smart Phones, Tablet PCs, Laptops, etc.)<br>Search engines<br>Social Network Sites (Web 2.0)<br>Wireless Application Protocol (WAP)<br>Mobile Commerce<br>Mobile Banking<br>EMV/Chip-based Payment Cards (Debit, Credit, etc.)<br>Web-based DSS |
| Fifth Era 2000s – Cont. | Near Field Communication (NFC)<br>Android (Operating system)<br>Social Banking |

one reason or another. Nonetheless, the research (e.g., Chang, 2013a; Lee, 2009) has used the terms IS and IT interchangeably, and IT has been considered a subset of IS.

To better understand and provide a robust examination of IT/SCU, the authors divert their attention from empirical studies to other published sources, such as books, market analyses and reports. Belle, Nash, and Eccles (2003, p.24), in their book entitled, 'Discovering Information Systems,' explained that for any technology-related initiative to be considered an information system, it should fulfill the basic components that interact, such as the hardware or physical equipment used to process and store data; the software and procedures used to transform and extract information from the data; the data that represent the activities of the business; the network that permits the sharing of resources between computers; and the people who develop, maintain and use the system. Conclusively, IS appears to be a combination of three major parts: people, business processes, and Computers (information technology), which are commonly referred to by Frost, Pike, Kenyo, and Pels (2011, p.12) as the 'information systems triangle'. Providing an explicit understanding of information systems, Buckland (1991) argued that information systems are innovative systems that provide useful information services to keep human beings or users becoming informed.

Historically, until the 1960s, the development of data network technology led to the development and adoption of electronic data processing (EDP) systems. The most famous EDPs include transaction support systems (TSS), which were meant for lower-level non-management staff to process routine daily business transactions such as accounting and finance as well as to produce pre-defined management reports. Avram (1994) argued that TSS are information systems that collect data and distribute operational data both within and between organizations. Retrospectively, TSS helps planners and managers make short-term, limited-impact and tactical decisions. Table 1 provides a detailed evolutionary path of information systems in different eras.

In the late 1960s, another capability was added to the computer systems to process data into more meaningful informative reports. As a result, research and business instigated the concept of the management support systems (MSS). The primary role of MSS was to support middle management in their decision-making processes. While some envisioned MSS as "central nervous systems" for organizations (Watson, Rainer, & Koh, 1991), in practice, they largely expanded the reporting system and provided middle management with structured, periodic reports. Li, Mcleod, and Rogers (2001, p.307) explained that '*Marketing was the first functional area to embrace the concept of a management support system and tailor it to the needs of its managers.*' Kotler (1966) introduced the term 'marketing nerve center' and explained the significance of creating a separate area for computer resources specifically dedicated to supporting marketing activity.

In the 1970s, subsequent to the emergence of multinationals in almost every business sphere and with technology altering the nature of competition, a new breed of information systems with unique characteristics began to emerge, providing assistance for specific decision-making tasks along with an interactive and dynamic support for higher management in their day-to-day decision-making processes. These systems were usually referred to as decision support systems (DSS).

In the early 1970s, business journals started to publish articles on DSS, management decision systems and strategic planning systems. For example, in 1976, Sprague and Watson published an article examining DSS and their application to banks. In 1971, Michael S. Scott Morton's book titled, 'Management Decision Systems: Computer-Based Support for Decision Making' was published. Professors Capon and Hulbert, in their paper published in 1975, described the application of decision system analysis (DSA) to four marketing decision systems, such as pricing, forecasting, advertisements and new product development. They concluded that the application of DSA to key marketing decisions identified various inconsistencies in marketing operations and provided significant insights into the problems faced by a company, a large multinational British firm.

As the evolution of computer support for organizational personnel is considered, one group is conspicuously missing: the senior executives of firms (Watson et al., 1991). Although the earlier advancement in the information systems domain (e.g., TSS, MSS, DSS) was thought to serve different management levels in an organization, unfortunately, little support was provided to higher management. It became evident that most top executives did not directly use TSS, MSS or DSS to generate reports and analytics. Executive support systems (ESS) were developed during the 1980s in a growing number of firms (Power, 2007). During this time, advancements were also noticed in the development and deployment of artificial intelligence (AI) applications in business information systems. As a result, more advanced and self-operated information systems, such as expert systems (ES) and knowledge management systems (KMS), were introduced to large corporations and financial institutions to supplement complex decision-making process, producing better results and increased profits. In its current manifestation, KMSs fall into two broader categories: decision support technologies and the workgroup support systems (Lin, 2014). Decision support technologies are largely meant to support the existing organizational knowledge. The workgroup support systems are general systems that help groups of knowledge workers performances their jobs better.

Another interesting development that continues to elude practitioners and research alike within the information systems

domain is the development and deployment of Enterprise Recourse Planning (ERP) Systems. ERPs were first introduced during 1980s but their usage was observed during 1990s mainly in large organizations. An ERP system is a commercial software package that integrates business information and processes within and across all functional areas, enabling executives to manage resources efficiently and effectively (Nwankpa, 2015; Yoon, 2009). The prominent ERP system examples include SAP ERP software and Oracle's E-Business Suite (Chou, Chang, Lin, & Chou, 2014). ERP systems have the potential capability to provide multiple end-users with rapid real-time information (Chou, Lin, Lu, Chang, & Chou, 2014), strategic and competitive advantage (Nwankpa, 2015); and facilitate integrated and real-time planning, production, and customer response (Bradford & Florin, 2003). Consequent to these benefits, the ERP system has become the backbone of the information system of the company (Yoon, 2009).

## 3. Previous literature reviews on information technology & systems usage

A difference is observed between and among the terms 'review,' 'literature review' and 'meta-analysis'. As explained by Frohberg, Göth, and Schwabe (2009), a review is broader than a literature review but less empirical than a meta-analysis. Prior research has conducted literature reviews and meta-analysis in the broader field of IT/S and published in leading journals (see Appendix A). Nevertheless, a majority of these efforts have explored and synthesized the academic literature on single information systems, such as m-banking (Shaikh & Karjaluoto, 2015), m-technology (Sanakulov & Karjaluoto, in press), e-banking (Hoehle, Huff, & Goode, 2012), m-marketing (Varnali & Toker, 2010), m-learning (Frohberg et al., 2009), m-payment (Dahlberg, Mallat, Ondrus, & Zmijewska, 2008), e-commerce (Ngai & Wat, 2002), m-commerce (Ngai & Gunasekaran, 2007), m-internet (Gerpott & Thomas, 2014), knowledge management systems (Alavi & Leidner, 2001), and online communities (Malinen, 2015).

Other aspects of the landscape, such as IS security (Dhillon & Backhouse, 2001), IS outsourcing (Gonzalez, Gasco, & Llopis, 2006), business process reengineering (Lee & Dale, 1998), IT and organizational performance (Melville, Kraemer, & Gurbaxani, 2004), and supply chain management (Srivastava, 2007) were also synthesized and analyzed. Notably, none of these efforts has discussed the post-adoption scenario in the IS context. Nevertheless, an analysis of the research on information systems (1981–1997) was conducted by Claver, González, and Llopis (2000) in which the underlying aim was to highlight the most frequently researched topics, the research method used and to determine which authors published the most articles in the IT/S field. In our opinion, their objective did not fulfill the post-adoption literature review criteria. In another attempt, a detailed review of the IS literature to discover the extent of multi-method research was conducted by Mingers (2003). Here, the author addressed the question of the extent of multi-method research that is carried out and published in IS journals. The main conclusions of this review were that despite the availability of a high proportion of empirical papers in IS Journals, only approximately 20% use a combination of methods. Of these, a large quantity of papers used the traditional methods of surveys, case studies, interviews, and observations. In addition, only 15% of instances used 'nontraditional' methods (such as ethnography, action research, and consultancy), and these proportions have not changed significantly over time.

## 4. Research methodology

The research methodology used by Leitner and Rinderle-Ma (2014) was largely adopted. First, the research objectives and questions were identified, followed by an extensive literature search using both horizontal (e.g., Google Scholar) and vertical (e.g., ScienceDirect) search options. Based on the search results, the literature was synthesized and classified into four major domains to provide a guiding structure, effectively accumulate knowledge, and interpret research outcomes, gaps, and challenges.

### 4.1. Literature search

Using various key terms such as 'IS Continuous Intention,' 'IS Continuous Usage,' 'IS post-Adoption,' 'IS Continuous Acceptance,' 'IS Infusion,' 'IS Continuous Adoption' 'IS Assimilation' and 'IS Extended Usage' (abstract, title, keywords, methodology), researchers in the present study used Google Scholar to perform comprehensive horizontal searches (Leitner & Rinderle-Ma, 2014). Similarly, various scientific databases, notably ScienceDirect, Wiley, JSTOR, ACM, IEEE, ABI/INFORM, SAGE, Palgrave, Emerald, Inderscience, and Springer, were vertically searched. To examine the recent developments in this mature field, we set the investigation period from January 2000 to December 2014 (inclusive).

In addition, considering the interdisciplinary nature of this field, we searched for articles and conference proceedings across various journals in different disciplines such as marketing, finance, information technology, business and commerce. During the vertical search, relevant IS journals such as MIS Quarterly (MISQ), Computers in Human Behavior (CHB), Information and Management (I&M), Information Systems Journal (ISJ), European Journal of Information Systems (EJIS), and DSS were consulted. In addition, conferences such as the IEEE International Conference on Information Society (i-Society), the IEEE International Conference on System Science (HICSS) and the ACM – SIGCHI Conference on Human Factors in Computing Systems were examined. Finally, we looked through the bibliographies of key articles to ensure that we had not overlooked other articles (Leidner & Kayworth, 2006).

### 4.2. Literature selection

Given the pure vastness, diversity and flexibility of the IT/SCU literature, we chose to limit our initial sample of empirical studies to those in which IT/SCU was significant themes of the manuscript. This strategy, as explained by Leidner and Kayworth (2006), is adopted and used to avoid having an unmanageable sample of articles with limited value. In addition, to broaden our understanding of the empirical IT/SCU, we also focused on identifying key non-empirical IT/SCU manuscripts and reading books or management journals that focused on theoretical and practical perspectives of continuous usage.

The resulting 152 relevant and useful peer-reviewed articles along with several conference proceedings, which came from 56 scholarly journals, 8 conference proceedings (see Appendix B), were selected, included and reviewed to build a comprehensive bibliography for this review, discussing continuous intention and usage in support of various information technologies, systems, tools and applications. IT/S such as m-banking, m-commerce, m-shopping, m-payments, internet (net) banking, virtual communities, social networking sites, social networking games, web-based services, computer-based assessments, e-learning, e-shopping and almost everything that met the purpose of this review were examined and reviewed. We understand that this research was not exhaustive for a review, but it serves as a comprehensive base for an understanding of the research on IT/SCU.

The method for analysis of empirical IT/SCU studies included in this review was to first classify each study according to its focus on a designated category. Next, each empirical study was reviewed to determine the general IT/SCU theme, the research methodology used, the unit of analysis, the independent, dependent and control

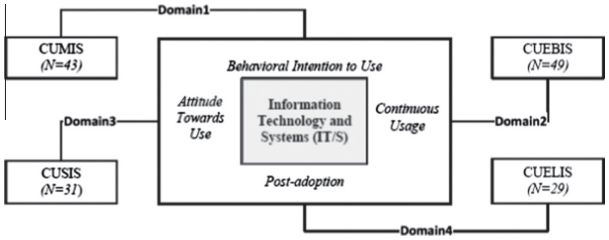


**Fig. 1.** Proposed framework.

variables used, and relevant findings (see Appendices B and C). The data contained in these appendices provide the basis for a subsequent analysis to identify the themes in IT/SCU as well as the perceived gaps and directions for future research (Leidner & Kayworth, 2006).

### 4.3. Formation of the framework and domains

Considering a substantial quantity of articles, conference proceedings and a significant body of non-empirical work, the main challenge was to segregate and classify the literature into a meaningful and solid structure that addresses and organizes continuous human intention and IT/S usage. To that end, we have taken a fairly broad view. The literature was synthesized, segregated and classified into various domains according to the purpose, nature and usage of the IT/S. As a result, it was decided that four major domains should be created that consist of various IT/S.

During the second stage, the category validation was established through an interactive process of assessing, reviewing and revisiting this manual cataloguing of IT/S into different domains by a group of potential respondents that consisted of experts and academics with extensive IT/S experience. We then pretest the domain formation with three experts. The main objective of conducting this expert review was to ensure the clarity, relevance and appropriateness of each system in its respective domains; these expert reviews helped us establish the domain validity. Based on the feedback and concerns received from the reviewers, necessary adjustments were made.

## 5. Classification framework

The studies selected and included in the review focused on the continuous behavior intention and use in support of IT/S. This review identifies and presents 54 information technology and systems classified into four broader domains: Continuous Usage of Mobile Information Systems (CUMIS), Continuous Usage of Electronic Business Information Systems (CUEBIS), Continuous Usage of Social Information Systems (CUSIS), and Continuous Usage of Electronic Learning Information Systems (CUELIS; see Fig. 1, where *N* indicates the number of studies included in each domain).

Considering the importance and the pervasive role of IT/S, we believe that this segregation within the IT/SCU literature will provide greater scalability, flexibility and space for future research. In addition, this proposed segregation allows future research to include more 'systems' in each category, depending upon the usage, relevance and nature of the 'systems' that will evolve over the period of time. Scalability will provide more insights and ideas to help future research in investigating and proposing domain-specific conceptual or business models that will help to understand the IT/S continuous usage according to the nature of the 'system' (Appendix C provides a detailed summary of domain-specific distribution of articles).

We argue that our proposed framework is used as a meta-model to classify the existing massive and largely separate literature that influences the IT/S continuous human intention and usage. The framework is useful for these purposes because it is conceptually sound and draws from previous research; it eliminates redundancy in the findings and analysis and helps to bring clarity to the multiple topics and to the vague, conflicting terminology used in the professional and academic literature on IT/S continuous human intention and usage (Dahlberg et al., 2008). Therefore, the aim is to categorize past research, analyze the research findings and identify and propose meaningful research questions for future research in each category or domain.

The first domain in this framework is called CUMIS. This domain was formed after considering an increasing number of studies in this domain and the exponential usage of smartphones, tablet PCs and other handheld devices for different purposes. Consequently, post-adoption studies on mobile banking (including mobile payments), mobile commerce (including mobile shopping), mobile services (including the mobile Internet) and so forth have been included in this domain.

The second domain called CUEBIS was formed after considering an exponential growth and usage in online shopping, e-commerce and enterprises systems. This domain includes electronic business and commerce-related applications and services, such as Internet or online banking, online shopping, and electronic purchasing. Similarly, online investments, online stock trading, financial planning, brokerage services and so forth have also been included in this domain. Enterprise or business systems such as ERP Systems, supply chain network, and customer relationship management were also included in this domain.

Social networking and virtual socialization (widely known as Web 2.0) have become increasingly important environments for social interaction. For social virtual worlds (SVWs) to be economically sustainable, attracting users and retaining existing users is a paramount issue (Mäntymäki & Merikivi, 2010). Concerning the growing usage and research in social networking and virtual worlds, the third domain is called CUSIS. This domain includes, among others, various papers that have investigated and discussed the usage of social networking sites (including SVWs), social networking games (considering the nature of *online games*, we have excluded it from this domain and included it in the CUEBIS domain), online communities (including virtual communities), and so forth. According to eMarketer (2013) the number of social network users around the world would rise from 1.47 billion in 2012 to 1.73 billion in 2013, an 18% increase. By 2017, the global social network audience will total 2.55 billion. As a consequence of these predications, creating a separate domain on social IT/S will allow for valuable future research possibilities, as discussed in the succeeding sections.

The fourth and final domain in our proposed framework, called CUELIS, includes various technology and systems, such as electronic learning (including applications), electronic textbooks, student information systems, and cyber universities. To bring more clarity to this domain, we have excluded from this domain all e-learning systems that are aimed at employees or managers as a part of their organization-wide on-the-job learning and training programs. Consequently, all of those systems have been included in the CUEBIS domain.

## 6. Results and discussion

The study of continued use has become one of "the most welcome developments" in recent IT/S research (Guinea & Markus, 2009, p. 433). As a result of their significance, continuous usage behavior and intention to use IT/S have received great attention from researchers. Consequently, a growing body of literature in continuous intention and usage has discussed two distinct streams. The first stream is supported by the expectation confirmation theory proposed by Bhattacherjee (2001b), whereas the second stream, proposed by Jasperson et al. (2005), is based on the theory of reasoned action and diffusion theory and suggests the initial use, habits, and a feature-centric view of technology as factors specifically relevant to continuous usage (Choi, Kim, & Kim, 2011). As a result, the first stream is more appropriate to study the consumer IT/S adoption and usage, and the second stream is more fitting to study the organizational IT/S adoption and usage.

This review yields several key findings and has been divided into four major sub-sections: major findings; domain-specific major findings; major models, theories and frameworks used in IT/SCU; and major factors that influence human continuous behavioral intention, attitude and use of IT/S.

### 6.1. Major findings

The studies included in this review investigated and identified several influences on human behavioral intentions, attitudes and actual usage in a variety of IT/S. For example, of the 152 studies included in this review, about 75% of the studies predicted the continuous behavioral intention to use IT/S as a proxy for actual use (e.g., Agudo-Peregrina, Hernández-García, & Pascual-Miguel, 2014). Some studies (23%) identified the consequences that affect the continuous or actual usage of IT/S, a process usually defined as the internalization of technology (e.g., Yim, Forman, & Kwa, 2013). Only one study (Verhagen et al., 2012) used 'attitude towards use' as a behavioral variable in understanding the usage of virtual worlds. Within the behavioral studies conducted in the IS literature and included in this review, only one study proposed a theoretical framework that compared the antecedents of intention and actual usage behavior in the same framework (Kim & Kwahk, 2007). The year-wise distribution of the literature included in this review revealed an interesting scenario. For example, it was found that more than half (58%) of the studies on IT/SCU were published in the last five years i.e., from 2010 to 2014. Only one study was published in each of the years 2002 and 2000 (see Fig. 2). Among the scholarly databases searched for the relevant articles, more than half of the papers (61%) were found in *ScienceDirect* and *Wiley* scholarly databases, and the smallest quantities of articles were found in *ACM*, *INFORMS/ABI*, and *M.E. Sharpe* (see Fig. 3).

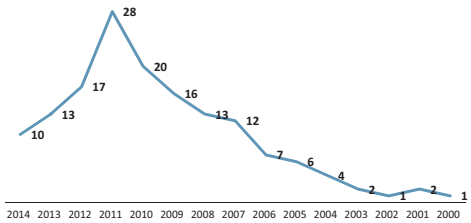


**Fig. 2.** Year-wise distribution of articles on IT/SCU.

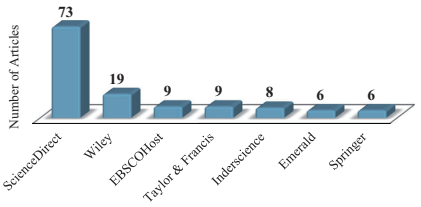


**Fig. 3.** Scientific database-wise distribution of articles (>5 articles published on IT/SCU).

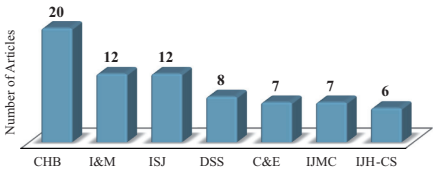


**Fig. 4.** Journal-wise distribution of articles (>5 articles published on IT/SCU). CHB – Computers in Human Behavior; I&M – Information and Management; ISJ – Information Systems Journal; DSS – Decision Support Systems; C&E – Computers and Education; IJMC – International Journal of Mobile Communications; IJH–CS – International Journal of Human–Computer Studies.

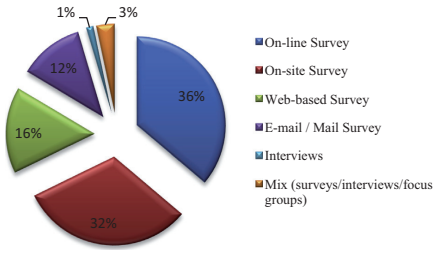


**Fig. 5.** Data collection methodology used in the journals included in this literature review.

Of the 56 journals identified and included in this review that have published articles on IT/SCU, nearly one-third of these journals (61%) published only one article on IT/SCU during the period under review. Furthermore, of these 152 articles, *CHB* published the most articles (13%), followed by the *ISJ* (8%), *I&M* (8%), *DSS* (eight, or 5%), *Computers and Education* (C&E, 5%) and others, such as *MISQ*, *Journal of Business Research*, *EJIS*, *Decision Sciences* (*DS*) *and Information Systems Research* (*ISR*), which led to a total of 56% of articles. The remaining 5% of articles were conference proceedings mostly published by *IEEE* (see Fig. 4).

The average (mean) sample size was 508 participants. Quantitative research was the most popular method. A few studies

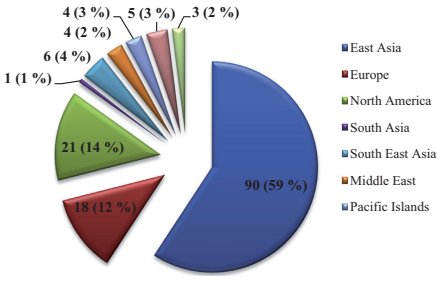


**Fig. 6.** Region (location) profile.

used the qualitative research methodology. Within the ambit of quantitative research, mostly traditional methods were used to collect data such as online surveys (36%) followed by on-site or paper-based surveys (32%), web-based surveys (16%), and e-mail/mail surveys (12%). Fig. 5 illustrates the types of data collection methods used. In differentiating between online and on-site surveys, Bhattacherjee (2001a) explained that online surveys have several advantages over paper-based or mail-in surveys; for instance, in online surveys, the sample is not restricted to a geographical location, large samples are possible, the surveys cost less, and the responses are faster.

A computer-assisted telephone interviewing (CATI) survey was used in one study (Hernández-Ortega, 2011). Of the 152 studies, only four studies (3%) used interview or qualitative methodologies to collect primary data. While investigating the effect of consumer internet experiences on channel preferences and usage intentions across the different stages of the buying process, Frambach, Roest, and Krishnan (2007) conducted a mix of professionally administered focus group discussions and in-depth interviews among 24 consumers in the United States and Europe (the U.K., the Netherlands, and Sweden) to collect data.

Nearly one-third (67%) of the studies solicited data from the users, netizens or members and students. The remaining (33%) studies collected data from other participants, such as customers/consumers (14%), working professionals such as owners, employees, workers, managers and staff members (13%) and faculty members (2%). A mix of participants including students, faculty members and employees was also used in five (3%) studies (see Fig. 7). Among the most frequently investigated regions were East Asia (e.g., Taiwan, China, Hong Kong and South Korea) and North America (e.g., USA). A few studies applied to Europe (e.g., Finland, Estonia, Norway, Netherlands and Turkey) and other

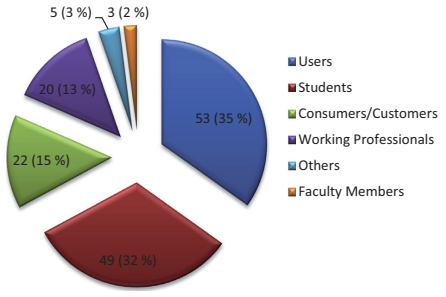


**Fig. 7.** Participants' profile.

regions such as the Middle East (e.g., Saudi Arabia), Pacific Island countries (e.g., Australia and New Zealand) and Southeast Asia (e.g., Malaysia and Singapore). A few studies also used multiple locations and regions (see Fig. 6). For example, Zhu and Kraemer (2005) investigated the post-adoption stages, that is, the actual usage and value creation in electronic business using the dataset of 624 firms across 10 developed and developing countries in the retail industry. In the context of e-learning continuous intention, Roca and Gagné (2008) used a web-based survey instrument to obtain the data from workers of various international agencies of the United Nations from a specific region of the globe made up of three or four countries.

Analyzing the acceptance models used by these studies revealed a large and heterogeneous set. As discussed in a later section, a total of 41 technological and social psychological adoption theories, models, and frameworks provided foundations for investigations of IT/SCU (see Appendix B). Some authors used one specific adoption theory or an extension of it, such as the expectation confirmation theory (ECT; e.g., Chang & Zhu, 2012; Chou & Chen, 2009), expectation disconfirmation theory (EDT; e.g., Chiu, Hsu, Sun, Lin, & Sun, 2005; Shi, Lee, Cheung, & Chen, 2010), or the technology acceptance model (TAM; e.g., Lu, Chou, & Ling, 2009; Wang, 2014). Others combined different theories, such as ECM and TAM (Hong, Thong, & Tam, 2006), ECT and UTAUT (Venkatesh, Thong, Chan, Hu, & Brown, 2011), ECT and a two-factor theory (Najmul Islam, 2014), ECT and task-technology fit (Larsen, Sørebø, & Sørebø, 2009), or TAM and self-determination theory (Roca & Gagné, 2008). In addition, a few authors (e.g., Li, Browne, & Chau, 2006; Saraf, Liang, Xue, & Hu, 2013) have used self-constructed models (SCM) comprised of various independent variables adopted from different models, theories and frameworks. One of the intriguing findings of the literature review is an extensive usage of TAM in the post-adoption studies, which were earlier believed to be dominated by ECT. The synthesis of the literature revealed that in all 152 of these studies, TAM (its extension and/or usage with other theories/models) is used in 24% of studies, followed by ECT/ECM (its extension and/or usage with other theories/models) in 13% studies. The third most-used model was UTAUT (its extension and/or usage with other theories/models) in 4% of studies included in this literature review.

Of these 152 studies, the largest quantity of the studies (32%) fall under the CUEBIS domain; 28% fall under the CUMIS domain; 21% fall under the CUSIS domain; and the rest, i.e., 19% fall under the CUELIS domain (see Fig. 1).

### 6.2. Major domain-specific findings

The advent and the adoption of mobile technology is quickly changing the way to run a business, as demonstrated by the usage of mobile commerce applications, and it has also enabled the transformation of the way that business and governments deliver their services (Wang, 2014). As a result, an extensive usage of mobile technology and Wi-Fi-enabled portable devices has convinced businesses and governments to prepare themselves to transition from electronic services to mobile services. In one of its recently published market survey reports, eMarketer (2014) predicted that the number of global smartphone users will surpass 1.75 billion by the end 2014 and concluded that smartphone adoption and usage will continue on a fast-paced trajectory through 2017.

A synthesis of studies included in the CUMIS domain reveals a few key findings. For example, out of 43 studies that fall under this domain, thirteen (or 33%) have investigated m-internet, followed by seven (or 16%) for m-Services & applications, six (or 14%) for m-data services and applications, and five (or 12%) for m-banking continuous intention and usage. Only three studies (or 7%) were conducted on m-commerce and two studies (or 5%) on

m-payments usage. The lowest quantity of studies (i.e., one each) was conducted in the areas of m-ticketing, m-games and m-government, thereby leaving ample opportunity for scholars to conduct further investigations on these research areas.

In addition to the classification of IT/S that falls in this domain, this literature review has also revealed the quantity of studies published in peer-reviewed journals as opposed to conference proceedings. Most of the studies included in this domain were published in the *International Journal of Mobile Communications* (seven, or 16%), *ISJ* (four, or 9%), *DSS* (three, or 7%) and *CHB* (three, or 7%). This domain was largely dominated by scientific articles and only three (Kim & Kwahk, 2007; Lin & Wang, 2005; Mallat, Rossi, Tuunainen, & Oorni, 2006) were IEEE conference proceedings.

When analyzing the geographic distribution of the papers, it was observed that more than two-thirds of the studies (67%) were conducted in East Asia (China, South Korea, Hong Kong and Taiwan). A few were conducted in Europe (Finland and Norway), Southeast Asia (Singapore) and Pacific Island countries (Australia). No study on post-adoption within the 'systems' included in this domain was conducted in Africa, the Middle East or most of the South Asia region. Only one study (i.e. Lee, Choi, Kim, & Hong, 2007) was cross-cultural in nature. Investigating the effects of cultural characteristics on the post-adoption beliefs of m-Internet users, Lee et al. (2007) conducted multiple large-scale online surveys in Korea, Hong Kong, and Taiwan and concluded that four cultural factors, i.e., uncertainty avoidance, individualism, contextuality, and time perception, have a significant influence on users' post-adoption perceptions of m-Internet services.

Analyzing the models used by these studies reveals a large and heterogeneous set because several technological and social psychological theories, models, and frameworks provided foundations for the investigations of the human continuous intention and usage of mobile technology and systems included in this domain. A close analysis of the domain revealed that the majority of studies (30%) have used the TAM or an extension of TAM (e.g., Shin, Lee, Shin, & Lee, 2010; Verkasalo, López-Nicolás, Molina-Castillo, & Bouwman, 2010; Wang, 2014). A few have combined TAM with different theories, such as IDT (Mallat et al., 2006), TRA (Nysveen, Pedersen, & Thorbjørnsen, 2005a), and TPB (Lin & Wang, 2005). In addition, the majority of the authors, i.e., (e.g., Lin & Shih, 2008; Tojib & Tsarenko, 2012) have also used self-constructed models comprised of different constructs derived from various models or theories. The expectation confirmation model (ECM) proposed by Bhattacherjee (2001b) has rarely been used in this domain; only two studies (Thong, Hong, & Tam, 2006; Zhou, 2011a) have used the ECM or an extension of the ECM. For example, deliberating the importance of using an expanded ECM by incorporating the post-adoption beliefs of perceived usefulness (PU), perceived enjoyment (PE) and perceived ease of use (PEOU), Thong et al. (2006) explained that expanded ECM has good explanatory power; it can provide supplementary information that is relevant for understanding IT/SCU, and an expanded ECM presents IT product/service providers with deeper insights into how to address IT users' satisfaction and continued support.

The second domain, CUEBIS, consists of several IT/S, including e-commerce, e-shopping, ERPs, supply chain management, internet (online) banking, and so forth. Out of 49 IT/S included in this domain, 18% of the studies investigated e-shopping continuous intention and usage, followed by e-learning for employees (10%), ERP systems (10%), and e-commerce (8%). A few have also analyzed e-government initiatives and online banking. In this domain, the lowest quantity of studies has been conducted in the areas of supply chain management, web analytics, and online stock trading systems. Park, Kim, and Koh (2010) identified the main factors that influence the continuous usage intentions of firms that employ web analytics services (WAS) and characterize the relationships among the identified factors and concluded that a client firm's continuous usage intention was influenced by both satisfaction with the WAS provider and dependence on the WAS provider. In addition, the information quality among the several quality factors analyzed was significantly associated with client firm satisfaction. More recently, according to the International Data Corporation (IDC, 2013) forecast, the worldwide business analytics software market grew 8.7% and reached USD 34.9 billion in 2012.

Most of the studies included in this domain were published in *ISJ* (six, or 12%) and four each in the *EJIS*, *I&M* and *DSS*. A few studies were published in *CHB*, *Expert Systems and Applications* and *ISR*. Similar to the CUMIS domain, this domain is also largely dominated by scientific articles, and only two (Wang & Lin, 2010; Zhai, 2010) were IEEE conference proceedings.

The geographic distribution reveals an interesting scenario. More than half of the studies (51%) were conducted in East Asia (China, South Korea, Hong Kong and Taiwan), and some were conducted in North America (18%) and the Middle East (6%). In addition, 8% of the studies were cross-cultural in nature. Europe, Spain and Estonia dominate the demographic criteria, and a total of 6% of the studies were conducted in these countries. No study within the 'systems' included in this domain on post-adoption was conducted in Africa or South Asia (mainly comprising India, Pakistan, Bangladesh, Nepal and Bhutan).

Out of 49 studies included in this domain, 14% have used a TAM or an extension of TAM (e.g., Cheng, 2011; Hsu & Lu, 2004; Lu et al., 2009). A few have combined TAM with ECT (e.g., Al-Maghrabi & Dennis, 2012; Al-Maghrabi, Dennis, & Halliday, 2011). In addition, 35% of the studies have used self-constructed models comprised of different constructs derived from various models or theories. The most anticipated expectation confirmation theory (ECT) does not seem to be convincing for the research in this domain. Only a few (6%) of the studies have used ECT or an extension of ECT (e.g., Bhattacherjee, 2001a; Hoehle, Scornavacca, & Huff, 2012).

The third domain, CUSIS, included the research carried out in the context of social networking sites/games, virtual/online worlds/communities, and so forth. Of the 31 studies included in this domain, more than half (58%) have investigated human intention and the usage of indifferent social networking sites (SNSs), notably Facebook, Cyworld and Twitter. In addition, a few (19%) analyzed social virtual worlds such as Habbo and Second Life. Among the prominent SNSs, Facebook received most of the attention from the research community. As a result, out of eighteen studies conducted on SNSs, 44% examined human behavior in using Facebook. Only one study was found on Twitter (Park & Lee, 2010), and no scientific studies on other popular SNSs such as MySpace and Friendster were found.

Most of the studies included in this domain were published in *CHB* (36%) and *I&M* (13%). Two studies (6%) were published in *Information Systems and e-Business Management* and one each in *DSS* (Al-Debei, Al-Lozi, & Papazafeiropoulou, 2013) and *Information Processing and Management* (Park, 2014). Like two previous domains, this domain is also largely dominated by scientific articles, and only three (Ham, Park, Lee, & Moon, 2012; Mäntymäki & Merikivi, 2010; Shi et al., 2010) were IEEE conference proceedings.

A large quantity of studies (68%) was conducted in the East Asia region comprised of China, South Korea, Hong Kong and Taiwan. A few (16%) were conducted in Europe (Finland, Spain, Netherlands, and the U.K.), and three (10%) were conducted in the USA. Notably, no study was conducted on CUSIS in regions such as Southeast Asia, South Asia, Africa, Pacific Island countries (Australia, New Zealand) and the Middle East, which comprise several important emerging markets, such as India and South Africa.

This domain seems to be largely dominated by self-constructed models. Out of 31 studies included in this domain, more than half

(55%) used self-constructed models comprised of different constructs derived from various models or theories. Two studies (6%) used an extension of ECT (Chang & Zhu, 2012; Kang, Hong, & Lee, 2009), and only one has used an extension of TAM (Van der Heijden, 2003).

The fourth and last domain, CUELIS, is largely dominated by online, Internet and web-based learning information systems, tools and applications. Only one study investigated student information systems (Saeed & Abdinnour-Helm, 2011), learning management systems/Moodle (Najmul Islam, 2014), electronic courseware (Park, Lee, & Cheong, 2007), and electronic textbooks/e-texts (Stone & Baker-Eveleth, 2013). Consequently, the participants of the studies that fell under this domain were largely the students and faculty members.

Upon investigation, it was revealed that the research (e.g., Chiu et al., 2005) has divided the e-learning methodology into two major categories: The first, called the synchronous e-learning system, provides a real-time two-way interaction between learners and instructors that is facilitated by technological tools such as videoconferencing, teleconferencing, and chat rooms. The second method, called the asynchronous e-learning system, is a self-study learning system where the interaction with the instructor is largely carried out through email, voicemail, message boards and forums in a non-real-time mode.

Among the peer-reviewed journals, *C&E* has published the highest quantity of studies (24%) on the 'systems' included in this domain, followed by *CHB* (17%) and *I&M* (10%). One study was published in *MISQ* and *Information Research*. Unlike the previous three domains, this domain is dominated by scientific articles, and no conference proceeding was found in this review. Demographically, a large quantity of studies was conducted in Taiwan (38%) and the USA (24%). Two each were conducted on China and Hong Kong. A few studies were also conducted in Europe (Norway, Finland and Spain), but no study was conducted Africa, the Middle East or South Asian countries.

The studies included in this domain have predominantly used ECT and TAM as theoretical models to test the hypotheses, conduct analyses, and record the findings. Out of the 29 studies in this review, 35% of the studies used an extension of TAM (e.g., Park et al., 2007) or combined TAM with another model or framework, such as ISSM (Saeed & Abdinnour-Helm, 2008) and EDT (Premkumar & Bhattacherjee, 2008). Similar to TAM, 21% used either an extension of ECT (e.g., Limayem & Cheung, 2011) or combined ECT with another model or framework, such as TTF (Larsen et al., 2009). A few studies (21%) also used self-constructed models in the systems included in this domain.

Conclusively, these domains have revealed a few significant, highly interesting and useful findings for future research, which will be discussed in the following sections in detail. Nevertheless, it may be pertinent to argue that the research on post-adoption in the context of IT/S conducted in the last two decades is evidently unbalanced. A few geographic regions and systems dominate the investigation criteria, and a few others have been either completely overlooked or ignored. Despite the increased attention from peer-reviewed publications, conference proceedings and popular market reports, there is still no common understanding for many information systems, including the concepts of web-based learning, electronic learning, and online learning.

### 6.3. Major models, theories and frameworks used in IT/SCU

Various theoretical frameworks, models and theories to study IT/S acceptance and use have emerged over the last three decades (Agudo-Peregrina et al., 2014). Starting with the theory of reasoned action-TRA (Fishbein & Ajzen, 1975) and the rest of models that stem from it, such as the TAM (Davis, 1989), the theory of planned behavior, or TPB (Ajzen, 1991), and the unified theory of acceptance and use of technology or UTAUT (Venkatesh, Morris, Davis, & Davis, 2003). Another model, the cognitive model (COG), was proposed for continuance behavior; it combines some of the variables used in both TAM and ECM (Liao, Palvia, & Chen, 2009).

Although ECT has been used in marketing research to study consumer satisfaction and post-purchase behavior (Venkatesh et al., 2011), it was adapted from the consumer satisfaction/dissatisfaction model (Churchill & Suprenant, 1982; Liao et al., 2009; Oliver, 1981), and it helps predict consumer behavior before, during, and after a purchase in various contexts in terms of both product and service repurchases (Al-Maghrabi & Dennis, 2012). In addition to ECT, TAM has often used by the information research community as the theoretical basis in support of information systems usage research (e.g., Verkasalo et al., 2010). Davis (1989) suggested TAM. It examines the mediating role of the PEOU and PU in the relationship between system characteristics (external variables) and the probability of system use (an indicator of system success). Recently, Venkatesh and Davis (2000) proposed an extended version of his model, TAM 2, in which a 'subjective norm' was included. TAM was not specifically developed to predict continued usage intention but was originally developed to focus on the motivations of users to accept a new technology instead of the continual use of a technology (Hong et al., 2006; Stone & Baker-Eveleth, 2013). However, in the last decade, extensive research has used it in post-adoption studies (e.g., Agudo-Peregrina et al., 2014; Wang, 2014).

In addition to popular information system theories and models, other theories, such as contingency theory (Khalifa & Liu, 2007), two-factor theory (Lee, Shin, & Lee, 2009), the push–pull–mooring framework (Hsieh, Hsieh, Chiu, & Feng, 2012), and social capital (and exchange) theory (He, Qiao, & Wei, 2009; Park, 2014) are also used to examine the continuous usage of IT/S. Park (2014), using social exchange theory (Thibaut & Kelley, 1959), investigated the effects of personalization on user continuous behavior in social networking sites and hypothesize that personalization influences the continued use of social networking sites through two factors: switching cost (extrinsic factor) and satisfaction (intrinsic factor). The authors conclude that personalization increases switching costs and satisfaction, which results in further use of SNSs. It is therefore necessary to consider both extrinsic and intrinsic factors of user perceptions when adding personalization features to social networking sites. Likewise, using the two-factor theory developed by Herzberg, Mausner, and Snyderman (1959), Lee et al. (2009) concluded that information quality is the motivator and that system quality is the de-motivator of mobile data services usage. Similarly, information quality had a stronger influence on mobile data services usage when the main motive was utilitarian rather than hedonic.

### 6.4. Major factors that influence human continuous behavioral intention, attitude and use of IT/S

Several independent and dependent variables appear in the analysis and investigations of varying aspects of human decision-making processes related to the usage behavior that exceeds the simple, shallow, and routine use (Hsieh & Wang, 2007) of information technology and systems. In particular, three main dependent variables (i.e., attitude, intention, and usage) and several independent variables emerged from this review.

Of these three dependent variables, a majority of the studies focus on the antecedents of the intention to use (e.g., Chiu, Wang, Fang, & Huang, 2014; Hartono, Holsapple, Kim, Na, & Simpson, 2014) and actual usage (e.g., Chang, 2010; Saraf et al., 2013; Wang, 2014). Only one study investigates the antecedents of attitude (Verhagen et al., 2012). Understanding the users' motivations to engage in virtual worlds (VWs), Verhagen and

colleagues found a significant and direct relationship between PU and entertainment value on the attitude towards VW continuous usage.

Multiple studies also attempt to identify the antecedents and drivers of post-adoption human behavioral intention and usage behavior. A few significant antecedents are 'consumer satisfaction,' 'PU,' 'PEOU,' 'subjective norms' and 'PE'. Nearly half of the studies (43%) used 'satisfaction' and 'PU' as key intrinsic factors to empirically establish the influence of these antecedents on continuous behavioral intention and usage. For example, in the mobile banking context, continuous intention is found to be solely dependent on the satisfaction of customers (Reji Kumar & Ravindran, 2012). In another empirical study, students' e-text continuous intentions are directly and meaningfully influenced by their satisfaction and PU of electronic textbooks (Stone & Baker-Eveleth, 2013); user satisfaction with Web 2.0 applications (Facebook, iGoogle, Plurk, Twitter, and YouTube) and online knowledge groups significantly affects electronic word-of-mouth, which in turn significantly influences their continuous intention (Chen, Yen, & Hwang, 2012; Wang & Lin, 2010). Similarly, satisfaction and PU were found to play a significant role in the continuous intention and usage of web analytical services (Park et al., 2010), Internet-based learning technologies (Limayem & Cheung, 2011), online shopping (Khalifa & Liu, 2007), and cyber university systems (Liao, Chen, & Yen, 2007). When empirically investigating the employees' extended use of enterprise resource planning systems in a large manufacturing firm, Hsieh and Wang (2007) concluded that the PEOU and PU affect extended use, but notably, in the presence of PU and PEOU, satisfaction had no direct effect on the extended use of ERP systems. In the context of mobile data services and applications (MDSA), usefulness and enjoyment found positively associated with perceived monetary value, which means the MDSA users with higher levels of perceptions of usefulness and enjoyment will increase their perceptions of monetary value, resulting in a greater formation of habits and an enhancement of continuous intention, which ultimately lead to an increase in actual usage (Kim, 2012).

Exploring the continuous intention in the context of social networking websites, Hsu, Yu, and Wu (2014) concluded that satisfaction and PU are two important motivators of attitude, but the effect of satisfaction on attitude is much greater than its effect on PU. Cumulatively, prior empirical studies on IS acceptance and continuous usage have examined the consumer usage behavior in the short and long term (e.g., Lin, Fan, & Chau, 2014). In all of these major post-adoption studies, it is important to note in this argument that the research has persistently found satisfaction to be one of the significant consequences of success for developing a continuous usage behavior and a surrogate for post-adoption expectations.

The role of satisfaction as a predictor of intention is critical and has been well-established in the information systems, management, marketing, and reference disciplines (Chiu, Lin, Sun, & Hsu, 2009). Indeed, the marketing literature confirms that customer satisfaction is one of the main drivers of repurchasing, as has been verified in various different industrial and social contexts (e.g., Khalifa & Liu, 2007). Liao et al. (2009), while giving a comprehensive comparison of the three theoretical models i.e., TAM, ECM and the cognitive model (COG), clarified the variations in users' adoption behavior across various stages of IS usage. They demonstrate that the determinants and mechanisms of users' adoption decisions are moderated by usage experience. In addition, outcome expectations are the major antecedents of initial adopters' attitude and satisfaction, which in turn have significant effects on the intention to use. Conclusively, a growing body of research (e.g., Deng, Turner, Gehling, & Prince, 2010; Flavián, Guinalíu, & Gurrea, 2006) has generally established user satisfaction as an important factor leading to continued usage decisions and user retention for a variety of information systems.

A different set of consequences was also observed while investigating various technologies and systems included in this literature review. All of these consequences have mostly been analyzed only once in the context of post-adoption, for example, the *sense of belonging* (Lin et al., 2014), *credibility trust and benevolence trust* (Wu, Huang, & Hsu, 2013), *number of peers* (Lin & Lu, 2011), *community integration* (Sánchez-Franco, Villarejo-Ramos, & Martín-Velicia, 2011), and *perceived controllability* (Hsu & Chiu, 2004). Wu et al. (2013), concluded that *benevolence trust* has appeared to be one of the most important and direct determinants of users' continuous usage of online social networks (OSNs). Benevolence trust is the belief that business partners have the intent and motivation to offer benefits in specific new situations. In another study, while expanding the scope of educational research from superficial commitment and usage behavior to more sophisticated levels of social networking sites, such as Facebook, Sánchez-Franco et al. (2011) concluded that students' *social integration* provides strong support for the professors to adopt or continue using SNSs in learning processes.

A degree of synergy between satisfaction and flow experience also emerged from a few studies that reported that satisfaction and flow experience have significant effects on continuous intentions and is thus an important variable for IT/S (e.g., Hsu et al., 2014; Chang, 2013a). A few studies have reported that flow experience positively mediates the relationship between user satisfaction and continuous intentions; both human–computer interaction and social interaction lead to user satisfaction and flow experience (Chang, 2013a); flow experience has an influence on users' satisfaction (Chang & Zhu, 2012).

## 7. Implications

As observed, most of the studies included in this literature review have manifested valuable theoretical and practical implications, which have been synthesized and presented in the following sub-sections.

### 7.1. Implications for research

Extend research has provided valuable implications for research. For example, extending the prospect theory and providing additional theoretical reasons for understanding customers' repeat purchase intentions in B2C e-commerce, Chiu et al. (2014) explained that users' choices to avoid or seek risk vary across the types of value under evaluation. Theoretical frameworks that are meant to predict the risk-taking behavior of end-users should consider the differential influence of the nature of e-shopping goals. While measuring perceived security in B2C e-commerce website usage, Hartono et al. (2014), make important contributions to IT/S research by identifying and validating three important dimensions of perceived security i.e., perceived confidentiality, perceived availability, and perceived non-repudiation. The recognition of these major dimensions of perceived security provides the research with an opportunity to highlight the significance of each of these dimensions for improving customers' intentions.

A study conducted by Hsu and Lu (2004) significantly contributes to a theoretical understanding of the factors that promote entertainment-oriented IT usage, such as online games. The study suggested that entertainment-oriented IT is different from task-oriented IT in terms of their reasons for use. The authors clarified that the task-oriented IT usage is primarily meant to improve organizational productivity, and therefore, the TAM stresses the need for PU and PEOU as key determinants. However, in the context of entertainment-oriented IT, the study demonstrated that the importance of individual intentions to use involves other variables, such as social norms and flow experience.

Lin and Wang (2005) provide a few implications for research and suggest that TAM appeared to be better than TPB in explaining the behavioral intention to use an information system such as m-commerce. (The superiority of TAM over TPB is also endorsed by Wang, Lin, and Luarn (2006) in the context of m-services usage.) As a result, PU and PEOU were found to be significant consequences of the behavioral intention to use m-commerce. In addition, perceived self-efficacy and perceived financial resources were found to be significant consequences of behavioral intention. Therefore, measuring perceived self-efficacy and perceived financial resources as developed by this study provides valid instruments for assessing the perceived knowledge and financial resources of using m-commerce. In the same fashion, the study conducted by Mallat et al. (2006) provides several theoretical contributions to m-commerce and adoption research. Here, the study presents two empirically tested and valid constructs found to be significant in predicting mobile service use: mobility and use situation. These important constructs, as concluded by Mallat et al. (2006), capture the mobile dimension of service adoption and explain the competitive advantage of mobile service use compared with other service options. Predicting the consumer intention to use mobile services, Wang et al. (2006) provided several implications for research. One of the significant contributions of their research work is the validation of the m-banking acceptance model developed by Luarn and Lin (2005). The findings of their study strongly support the feasibility of using Luarn and Lin's model to understand the acceptance of m-services by individuals.

### 7.2. Implications for practice

Several valuable practical implications, specifically with regard to strategy and marketing, were reported in several studies that investigated different post-adoption consequences relating to various information technologies and systems. A synthesis of these findings revealed valuable implications for the industry. For example, when researching user values in using smartphones, Jung (2014) reported significant marketing implications and suggested that marketers can utilize the findings of his research to develop successful marketing strategies. Lin et al. (2014) provided several implications for research on social networking sites (SNS) and reported that the sense of belonging is a strong emotional reaction predictor for SNS, and consequently, it plays a crucial role in SNS continuous usage. SNSs have been used by different companies as massive marketing tools to attract customers. It therefore represents an important social media channel for reaching diverse demographic groups and customers for promoting products. Zhou (2013a), after examining the continuous usage of m-Internet services from the perspective of the resistance to change, suggested that a good interface design coupled with a few convenient and value-added services can considerably help in building consumer trust for continuous usage of m-Internet services and increase the switching costs.

The study on continuous online shopping conducted by Al-Maghrabi and Dennis (2012) provides managers with useful and important information about planning their e-commerce websites and marketing strategies and argued that the managers should build positive word-of-mouth to increase the perceptions of current customers and their friends and family members about usefulness, quality, interactivity, and enjoyment of their website. Zhou (2013b) implies that service providers should improve system, information and service quality to facilitate the continuous usage in the context of m-payment services.

How the organizational absorptive capacity matters in the assimilation of enterprise information systems (called ERP Systems) was the research interest of Saraf et al. (2013). They found a significant relationship between potential absorptive capacity (PACAP) and enterprise information system assimilation and called for organizational leaders to build the capability to better acquire and integrate external knowledge. In this reference, specific initiatives such as help desks, mentoring programs and retraining workshops all create an exceedingly accessible source of external knowledge for ERP users in their organizations. Understanding the factors that affect the continuous intention of m-banking, Chen (2012) reported that relationship quality is a significant element of developing a successful long-term relationship between consumers and m-banking service providers and an essential factor that causes consumers to retain continuous intention to the providers.

Providing implications for service providers in the telecom industry, especially in promoting m-data services usage, Lee et al. (2009) suggested that the industry may first profile people according to their main usage motivations for customized target marketing to optimize a service provider's business performance. Chiu and Wang (2008) implied that a reasonable understanding and relationship of performance expectancy, effort expectancy, and positive subjective task value with web-based learners is likely to establish longer-term relationships between and among the web-based learners, developers and designers of web-based learning sites. As a result, the developers and designers should presumably employ ways to reduce monotony and exploit web-based learners' playful characteristics.

On professional virtual community (PVC) usage, Chen (2007) conducted a longitudinal study and suggested that because the technological factors dominate a member's decision to stay with the PVC, managers of virtual communities should increase and maintain their websites' quality, such as system and knowledge quality, to satisfy PVC participants. In addition, managers should create an environment for positive and active knowledge-based communications between members. This can, however, be achieved by having a mechanism in place for blocking or punishing deceptive communications. Zhu and Kraemer (2005) tested their theoretical model on a dataset of 624 firms across 10 different developed and developing countries in the retail industry and suggested intriguing managerial implications in the context of e-business post-adoption. For instance, the authors suggested building technology competence, which includes tangible technologies, intangible managerial skills, and human resources. Moreover, a careful attention must be paid to the economic and regulatory aspects that may affect technology diffusion across different countries.

Citing another important implication for practice, Hsu and Lu (2004) emphasized the importance of social influences on online games. The authors suggested that online game managers should generate positive word-of-mouth and use mass advertisements to achieve a perception of a critical mass; i.e., the more users in an online game, the more user-generated experience it is likely to offer, and thus, the more users it will attract. This idea, which is commonly known as a *dynamic loop* and was founded by Hagel and Armstrong (1997), intends to yield increasing returns in an online or virtual community.

## 8. Conclusion

> '*Post-adoptive behavior occurs after an IS artifact has been implemented, made accessible to the user and applied by the user in accomplishing his/her work activities. This behavior may be quite different from the behavior in initial adoption stages*' (Recker, 2010, p.78).

The current study seeks to achieve several objectives, such as unifying and synthesizing disparate streams of research on IS usage into a more coherent body of knowledge, identifying and framing the research methodologies, frameworks, approaches

and models applied in this field, revealing the intriguing development and consolidation of the consequences and antecedents used in prior research to study and analyze human behavioral intention toward information system usage, providing a conceptual framework, and finally recommending directions and priorities for future research.

Given the pure vastness, diversity and flexibility of the IS continuous usage literature, we chose to limit our initial sample of empirical studies to those studies in which both IS and their continuous usage were significant themes of the manuscript. The resulting 152 relevant and useful peer-reviewed articles, a few conference proceedings and a few market reports, were selected, included and reviewed to build a comprehensive bibliography for this review, discussing continuous behavioral intention and usage in support of various information technologies, systems, tools and applications (see Appendix B).

The studies selected and included in the review focus on continuous behavior intention and use in support of IT/S. This review identifies and presents several information technology and systems that were later classified into four broader domains: Continuous Usage of Mobile Information Systems (CUMIS), Continuous Usage of Electronic Business Information Systems (CUEBIS), Continuous Usage of Social Information Systems (CUSIS), and Continuous Usage of Electronic Learning Information Systems (CUELIS).

It is not surprising that various IT/S such as m-Internet, m-banking, m-services, e-commerce, e-shopping, social/virtual networking, electronic and web-based learning have been the most researched systems, as calculated by the number of papers. In fact it is more surprising that in the CUMIS domain, the studies were on m-games, m-payments and m-ticketing; in the CUEBIS domain, the studies were on customer relationship management systems and web-analytics services; in the CUSIS domain, the studies were on social networking games; and in the CUELIS domain, the studies were on e-courseware, and studies on e-texts were almost non-existent.

While analyzing the quantity of studies published in various journals, we concluded that *CHB*, *ISJ* and *I&M* dominate the literature. Moreover, the demographic distribution of articles also revealed interesting traits. For example, most of the studies on IT/S continuous usage included in this review were conducted in East Asia (Taiwan, China, South Korea, and Hong Kong) and North America (USA only). The fewest investigations were conducted in Southeast Asia, the Middle East, and South Asia. Notably, no studies were conducted in Africa or Central Asian states. Certainly, the purpose of highlighting these facts is not to deprecate future research in East Asian or North American regions in the context of IT/S post-adoption but to inspire future research directions and highlight the gaps for future research.

In all of these studies, the survey methodology was widely and frequently used. A few studies used interviews and a mix of interviews, surveys and focus groups. Among the list of the participants, students dominated the selection criteria. The majority of the studies included in this review were published during the years 2010 and 2011. Analyzing the acceptance models used by these studies reveals a large and heterogeneous set. Our findings revealed that the most anticipated ECT (or ECM) was not specifically developed to focus post-adoption studies; most of the research has used TAM or an extension of TAM to investigate the human continuous usage behavior. A large quantity has also used a self-constructed model to test hypotheses and reach a conclusion. However, in all of these self-constructed models, the authors integrated different models and frameworks, such as the TAM, the TPB, the expectation disconfirmation model, and flow theory (Hsu et al., 2014), expectation confirmation theory, two-factor theory and the satisfaction model (Najmul Islam, 2014), the TAM, the motivational model and the theory of network externalities (Mäntymäki & Salo, 2011) to construct a research model that investigates the factors that motivate users to continue to use IT/S.

### 8.1. Limitations

Some limitations of this review offer opportunities for additional research (Shaikh & Karjaluoto, 2015). First, the post-adoption or continuous usage scenario is the core of this research, so it excludes the initial use, acceptance or adoption of IT/S, another important area of research. Incorporating all of these aspects of IT/S into future literature reviews would be useful for delineating the evolving technologies and systems and providing a complete and state-of-the-art picture of IT/S research. Second, despite clear reasons to commence the review in January 2000, a number of information technologies and systems also existed before that point. Third, our research was limited to renewed online libraries and journals and included a few conference proceedings. The relevant research on IS continuous usage has been published in many journals, such as MISQ, and a number of conference proceedings and conceptual papers (e.g., Huili & Zhong, 2011) may be included in future research. Other sources such as working papers, articles, and book chapters may also be available sources. Fourth, while our literature review was extensive and covered four major research domains, it is possible that some articles were missed. Finally, due to space limitations, the Appendix B included in this review does not contain a column listing the major findings of all of the studies included in this review (Hoehle, Scornavacca, et al., 2012). Nevertheless, the interested researchers are welcome to contact the corresponding author to obtain more detailed information on the development of this paper.

### 8.2. Future research directions

The following recommendations for research derive partly from the directions, recommendations, and suggestions mentioned in the reviewed studies as well as from the analysis of the results of the present study.

There has been an absolute dearth of qualitative research in all domains. We understand that a qualitative research approach may uncover new consequences that define consumer continuous usage behavior on information technology and systems. We have segregated the research in various domains; future research can examine the systems in each domain separately and record valuable findings. In this way, domain-specific literature reviews are also recommended with the purpose of bringing my discipline in the previous research and opening new possibilities for future research.

In addition, a few cross-country, transnational, cross-cultural and longitudinal studies that analyze the behavioral consequences of the continuous usage of information systems such as m-banking, m-payments, e-commerce and so forth are recommended. Moreover, a few studies that compare rural and urban population segments using various information systems are also useful and therefore recommended. Future research may also consider collecting a data sample from the regions that have either not been visited earlier or have drawn less attention from the research community, such as most of the European Union Countries, Africa, the Middle East, Central Asian States, Australia, New Zealand and South Asia. Several investigations in the areas of m-ticketing, m-games and m-government post-adoption, student information systems, learning management systems, electronic courseware and electronic textbooks/e-texts are also recommended.

Another exciting area for future research is the growing interest of organizations in developing and using e-collaboration technologies/systems. In practice, as explained by Serçe et al. (2011), e-collaboration is about creating effective collaborations between and

among different departments in an organization or with other organizations with the purpose of sharing business information to ensure better planning and decision making and improved efficiency. The prominent examples of e-collaboration technologies/systems include web-based chat tools, web-based (asynchronous) conferencing tools, e-mail/v-mail, collaborative writing tools, group decision support systems, teleconferencing and even social networking platforms. Future research in these directions would likely provide valuable insights.

Considering the enormous benefits and potential risks associated with the usage of IT/S and to protect the consumer interest, many mature and emerging countries have formalized the usage and implementation of various information systems such as m-banking, m-payments, m-government and so forth by introducing regulatory frameworks. Future studies of these frameworks could prove valuable. Moreover, as argued by (Shaikh & Karjaluoto, 2015), most consumers are most likely not aware of such legal or regulatory frameworks that govern the products or services they use. Investigating consumer behavior, awareness and understanding in this area would be worthwhile.

Another recommendation concerns new IT/S such as Payment & Settlement Systems, Adaptive Systems, Recommender Systems, Dynamic Personalized IS and Smart Tourist Management Systems. Empirical studies on the post-adoption or continuous usage of these systems are recommended. Alternatively, they can also be accommodated under a separate domain called 'Expert Systems.'

## Appendix A. Summary of reviews, literature reviews and meta-analysis conducted on IT/S

| S. No. | Citation | Title of study/*Name of the Journal* | Target IS | Nature of the study |
|---|---|---|---|---|
| 1 | Shaikh and Karjaluoto (2015) | m-Banking adoption – A literature review (*Telematics & Informatics*) | m-Banking Adoption | Literature Review and Meta-analysis |
| 2 | Gerpott and Thomas (2014) | Empirical research on mobile Internet usage – A meta-analysis of the literature (*Telecommunication Policy*) | m-Internet Usage | Meta-analysis |
| 3 | Gallagher and Savage (2013) | Cross-cultural analysis in online community research: A literature review (*Computers in Human Behavior*) | Online Community | Literature Review |
| 4 | Merali, Papadopoulos, and Nadkarni (2012) | Information systems strategy: Past, present, future? (*Journal of Strategic IS*) | Strategic IS (SIS) | Meta-analysis |
| 5 | Hoehle, Scornavacca, et al. (2012) | Three decades of research on consumer adoption and utilization of electronic banking channels: A literature analysis (*Decision Support Systems*) | e-Banking Channels | Literature Review |
| 6 | Varnali and Toker (2010) | Mobile marketing research: The-state-of-the-art (*Int. J. of Information Management*) | m-Marketing | Literature Review/ Review (terms used interchangeably) |
| 7 | Frohberg et al. (2009) | Mobile Learning projects – a critical analysis of the state of the art (*Journal of Computer Assisted Learning*) | Mobile Learning Projects | Literature Review |
| 8 | Dahlberg et al. (2008) | Past, present and future of mobile payments research: A literature review (*E-Commerce Research and Applications*) | m-Payments | Literature Review |
| 9 | Ngai, Moon, Riggins, and Yi (2008) | RFID research: An academic literature review (1995–2005) and future research directions (*Int. J. of Production Economics*) | Radio Frequency Identification | Literature Review |
| 10 | Rom and Rohde (2007) | Management accounting and integrated information systems: A literature review (*Int. J. of Accounting Information Systems*) | Management Accounting and Integrated Information Systems | Literature Review |
| 11 | Ngai and Gunasekaran (2007) | A review for mobile commerce research and applications (*Decision Support Systems*) | m-Commerce | Review |
| 12 | Srivastava (2007) | Green supply-chain management: A state-of-the-art literature review (*Int. J. of Management Reviews*) | Green Supply-Chain Management | Literature Review |
| 13 | Gonzalez et al. (2006) | Information systems outsourcing: A literature analysis (*Information & Management*) | IS Outsourcing | Analysis/Literature Review |
| 14 | Leidner and Kayworth (2006) | A Review of Culture in Information Systems Research: Toward a Theory of Information Technology Culture Conflict (*MIS Quarterly*) | Culture in IS | Review |
| 15 | Wang and Butler (2006) | System deep usage in post-acceptance stage: a literature review and a new research framework (*Int. J. Business Information Systems*) | IS | Literature Review |
| 16 | Sieber (2006) | Public Participation Geographic Information Systems: A Literature Review and Framework (*Annals of the Association of American Geographers*) | Public Participation Geographic IS | Literature Review |

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| S. No. | Citation | Title of study/*Name of the Journal* | Target IS | Nature of the study |
|---|---|---|---|---|
| 17 | Liao (2005) | Expert system methodologies and applications—a decade review from 1995 to 2004 (*Expert Systems with Applications*) | Expert System Methodologies and Applications | Literature Review |
| 18 | Melville et al. (2004) | Information Technology and Organizational Performance: An Integrative Model of IT Business Value (*MIS Quarterly*) | Information Technology and Organizational Performance | Review |
| 19 | Liao (2003) | Knowledge management technologies and applications—literature review from 1995 to 2004 (*Expert Systems with Applications*) | Knowledge Management Technologies and Applications | Literature Review |
| 20 | Grieger (2003) | Electronic marketplaces: A literature review and a call for supply chain management research (*European Journal of Operational Research*) | e-Marketplace | Literature Review |
| 21 | Mingers (2003) | The paucity of multi-method research: a review of the information systems literature (*Info. Systems J.*) | IS | Literature Review |
| 22 | Ngai and Wat (2002) | A literature review and classification of electronic commerce research (*Information & Management*) | Classification of e-Commerce Research | Literature Review |
| 23 | Dias (2001) | Corporate portals: a literature review of a new concept in Information Management (*Int. J. of Information Management*) | Corporate portals | Literature Review |
| 24 | Alavi and Leidner (2001) | Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues (*MIS Quarterly*) | Knowledge Management and Knowledge Management Systems | Review |
| 25 | Dhillon and Backhouse (2001) | Current directions in IS security research: Towards socio-organizational perspectives (*Info. Systems J.*) | IS Security | Literature Review |
| 26 | Haigney and Westerman (2001) | Mobile (cellular) phone use and driving: a critical review of research methodology (*Ergonomics*) | m-Phone Usage | Literature Review |
| 27 | Claver et al. (2000) | An analysis of research in information systems – 1981–1997 (*Information & Management*) | IS | Analysis/Literature Review |

## Appendix B. Summary of articles on IT/SCU included in this review

| S. No. | Citation | Methodology, participants and location | M/T/F | DV |
|---|---|---|---|---|
| 1 | Agudo-Peregrina et al. (2014) | Survey of 147 graduate students in Spain | TAM+ | INT |
| 2 | Chiu et al. (2014) | Survey of 782 Yahoo!Kimo customers in Taiwan | SRF | INT |
| 3 | Hartono et al. (2014) | Survey of 436 online shoppers/customers in SK | MECT; PT | ATT |
| 4 | Huang, Hsieh, and Wu (2014) | Survey of 405 Facebook users in Taiwan | U> FT | INT |
| 5 | Jung (2014) | Interviews* of 54 undergraduate students in SK | TAM+. | USAGE |
| 6 | Lin et al. (2014) | Survey of 742 college students in USA | *SCM* | INT |
| 7 | Najmul Islam (2014) | Survey of 314 faculty and students in Finland | *SCM* | INT |
| 8 | Park (2014) | Multimethod study (Interview & survey) of 677 students in USA | *SCM* | INT |
| 9 | Wang (2014) | Survey of 326 online service users/consumers in China | SET | USAGE |
| 10 | Zhou, Jin, and Fang (2014) | Survey of 464 Second Life users in China | NIL | INT |
| 11 | Al-Debei et al. (2013) | Survey of 403 Facebook users in Jordan | TPB+- | INT |
| 12 | Chang (2013a) | Survey of 358 Facebook Game users in Taiwan | *SCM* | INT |
| 13 | Hsu et al. (2014) | Survey of 482 Facebook users in Taiwan | *SCM* | INT |
| 14 | Kang, Min, Kim, and Lee (2013) | Survey of 278 Cyworld users in SK | *SCM* | INT |
| 15 | Ko (2013) | Survey of 283 bloggers in Taiwan | *SCM* | USAGE |
| 16 | Saraf et al. (2013) | Survey of 77 employees in China | *SCM* | USAGE |
| 17 | Stone and Baker-Eveleth (2013) | Survey of 469 university students in USA | ECM | INT |

(*continued*)

| S. No. | Citation | Methodology, participants and location | M/T/F | DV |
|---|---|---|---|---|
| 18 | Veiga, Keupp, Floyd, and Kellermanns (2013) | Survey of 153 employees in USA | *SCM* | USAGE |
| 19 | Wu et al. (2013) | Survey of 676 Facebook users in Taiwan | UTAUT+ | INT |
| 20 | Yim et al. (2013) | Survey of 413 suppliers in USA | IDT | USAGE |
| 21 | Zhou (2013a) | Survey of 277 mobile internet users in China | *SCM* | USAGE |
| 22 | Zhou (2013b) | Survey of 195 mobile payment users in China | ISSM; FT | INT |
| 23 | Zhou (2013c) | Survey of 234 mobile internet users in China | *SCM* | USAGE |
| 24 | Al-Maghrabi and Dennis (2012) | Survey of 234 university students in SA | TAM; ECT | INT |
| 25 | Chang (2013b) | Survey of 302 e-Learning systems users in Taiwan | *SCM* | INT |
| 26 | Chang and Zhu (2012) | Survey of 283 SNS users in China | ECT+ | INT |
| 27 | Chen (2012) | Survey of 390 m-Banking users in Taiwan | *SCM* | INT |
| 28 | Chen et al. (2012) | Survey of 409 Web 2.0 users in Taiwan | *SCM* | INT |
| 29 | Chiu, Hsu, Lai, and Chang (2012) | Survey of 454 Yahoo!Kimo customers in Taiwan | *SCM* | INT |
| 30 | Ham et al. (2012) | Field Survey of 171 virtual community users in SK | *SCM* | INT |
| 31 | Hoehle, Huff, et al. (2012) and Hoehle, Scornavacca, et al. (2012) | Survey of 210 net banking users in NZ | ECT+ | INT |
| 32 | Hsieh et al. (2012) | Survey of 319 bloggers in Taiwan | PPMF | INT |
| 33 | Kang, Lee, and Lee (2012) | Survey of 370 m-Banking users SK | *SCM* | USAGE |
| 34 | Kim (2012) | Survey of 317 m-data services & applications users in SK | *SCM* | INT |
| 35 | Kim and Hwang (2012) | Survey of 719 m-Internet users in SK | *SCM* | USAGE |
| 36 | Lin (2012) | Survey of 165 university students in Taiwan | TTF-ISCT | INT |
| 37 | Pi, Liao, and Chen (2012) | Survey of 126 online stock trading users in Taiwan | *SCM* | INT |
| 38 | Reji Kumar and Ravindran (2012) | Survey of 184 m-Banking users in India | *SCM* | INT |
| 39 | Tojib and Tsarenko (2012) | Survey of 603 advanced m-services users in Australia | *SCM* | USAGE |
| 40 | Verhagen et al. (2012) | Survey of 846 Second life users in the Netherlands | MT | ATT |
| 41 | Al-Maghrabi and Dennis (2011) | Survey of 465 faculty and students in SA | *SCM* | INT |
| 42 | Al-Maghrabi et al. (2011) | Survey of 465 faculty and students in SA | TAM; ECT | INT |
| 43 | Barnes (2011) | Survey of 339 Second Life users in UK | *SCM* | INT |
| 44 | Chang and Zhu (2011) | Survey of 278 netizens in China | TPB+ | INT |
| 45 | Cheng (2011) | Survey of 328 employees of eight financial services companies in Taiwan | TAM+ | INT |
| 46 | Choi et al. (2011) | Nationwide Survey of 997 M-Data Services users in SK | *SCM* | INT |
| 47 | Hernández-Ortega (2011) | Interview** of 100 employees in Spain | *SCM* | INT |
| 48 | Hung, Chang, and Hwang (2011) | Survey of 144 faculty members in Taiwan | ECT+ | INT |
| 49 | Jung (2011) | Survey of 194 Second Life users in Turkey | *SCM* | INT |
| 50 | Lee (2011) | Survey of 1266 3G mobile phone users in Taiwan | *SCM* | INT |
| 51 | Lee, Hsieh, and Hsu (2011) | Survey of 552 business employees in Taiwan | TAM; IDT | INT |
| 52 | Li, Troutt, Brandyberry, and Wang (2011) | Survey of 213 owners and managers of SMEs in USA | *SCM* | INT |
| 53 | Liang and Yeh (2011) | Survey of 390 m-Game users in Taiwan | TAM; TRA- | INT |
| 54 | Limayem and Cheung (2011) | Longitudinal survey of 505 e-learning technologies users HK | ECT+ | INT |
| 55 | Lin (2011) | Survey of 256 university students in Taiwan | *SCM* | INT |
| 56 | Lin and Lu (2011) | Survey of 402 Facebook users in Taiwan | MT; NE | INT |
| 57 | Lu, Yang, Chau, and Cao (2011) | Survey of 961 AliPay users in China | VF; TTF | INT |
| 58 | Mäntymäki and Salo (2011) | Survey of 2481 Habbo users in USA | *SCM* | INT |
| 59 | Pai and Tu (2011) | Survey of 210 staff members in Taiwan | UTAUT; TTF | INT |
| 60 | Park, Snell, Ha, and Chung (2011) | Survey of 204 college students in USA | AERCF | INT |
| 61 | Rodon, Sese, and Christiaanse (2011) | Multimethod qualitative study of 27 participants in Spain | NIL | USAGE |
| 62 | Saeed and Abdinnour-Helm (2011) | Survey of 1008 college students in USA | TAM+ | USAGE |
| 63 | Sánchez-Franco et al. (2011) | Survey of 99 Facebook users in Spain | *SCM* | USAGE |
| 64 | Shin and Shin (2011) | Survey of 280 Social Network Game users in SK | *SCM* | INT |
| 65 | Venkatesh et al. (2011) | Longitudinal study of 3159 HK citizens using e-government services | ECT; UTAUT | INT |
| 66 | Zhou (2011a) | Survey of 437 university students in China | UTAUT; FT | USAGE |
| 67 | Zhou (2011b) | Survey of 269 m-service users in China | ECT+ | INT |
| 68 | Zhou and Lu (2011) | Survey of 269 m-service users in China | *SCM* | USAGE |
| 69 | Bock, Mahmood, Sharma, and Kang (2010) | Survey of 144 employees and part-time students in Singapore | EDT, CDT- | INT |

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| S. No. | Citation | Methodology, participants and location | M/T/F | DV |
|---|---|---|---|---|
| 70 | Chang (2010) | Survey of 246 university students in Australia | *SCM* | USAGE |
| 71 | Deng et al. (2010) | Survey of 289 university students in USA | EDT+ | INT |
| 72 | Fang and Chiu (2010) | Survey of 142 virtual communities members in Taiwan | *SCM* | INT |
| 73 | Jin, Lee, and Cheung (2010) | Survey of 240 university students in China | *SCM* | INT |
| 74 | Kang and Lee (2010) | Field Survey of 254 Cyworld students in SK | *SCM* | INT |
| 75 | Kim, Kwahk, and Lee (2010) | Survey of 290 university students in Singapore | *SCM* | USAGE |
| 76 | Lee (2010) | Survey of 363 university students in Taiwan | *SCM* | INT |
| 77 | Lin and Bhattacherjee (2010) | Survey of 485 university students in Taiwan | *SCM* | INT |
| 78 | Lu, Deng, and Wang (2010) | Survey of 262 m-Phone users in China | TAM; NE | USAGE |
| 79 | Mäntymäki and Merikivi (2010) | Survey of 2215 Habbo users in Finland | TAM; ECT | INT |
| 80 | Ng and Kwahk (2010) | Survey of 157 university students in Singapore | SQBT | INT |
| 81 | Park and Lee (2010) | Survey of 105 university students in SK | *SCM* | INT |
| 82 | Park et al. (2010) | Survey of 152 CIO/CEOs and departmental managers in SK | ISSM+ | INT |
| 83 | Ramayah, Ahmad, and Lo (2010) | Survey of 1616 university students in Malaysia | ISSM | INT |
| 84 | Shi et al. (2010) | Survey of 125 Facebook users in HK | EDT+ | INT |
| 85 | Shin et al. (2010) | Survey of 244 m-Internet users in SK | TAM+ | USAGE |
| 86 | Verkasalo et al. (2010) | Survey of 579 m-Application users in Finland | TAM+ | INT |
| 87 | Wang and Lin (2010) | Survey of 298 knowledge discussion group users in China | *SCM* | INT |
| 88 | Zhai (2010) | Survey of 176 enterprises in China | TOE | INT |
| 89 | Chiu, Lin, et al. (2009) | Survey of 311 PCHome Online customers in Taiwan | TAM+ | INT |
| 90 | Chiu, Chang, Cheng, and Fang, (2009) | Survey of 360 PCHome Online customers in Taiwan | TAM+ | INT |
| 91 | Chou and Chen (2009) | Survey of 305 employees in Taiwan | ECT | INT |
| 92 | Gu, Lee, and Suh (2009) | Survey of 910 m-Banking users in SK | TAM+ | INT |
| 93 | He et al. (2009) | Multi-method study (Interview and survey) of 64 employees in China | SCT | USAGE |
| 94 | Hu, Brown, Thong, Chan, and Tam (2009) | Survey of 518 e-Tax service users in HK | *SCM* | INT |
| 95 | Kang et al. (2009) | Survey of 349 university students in SK | ECT+ | INT |
| 96 | Kim, Shin, and Lee (2009) | Online & offline survey of 192 m-Banking users in SK | *SCM* | INT |
| 97 | Kim, Choi, and Han (2009) | Survey of 542 university students in SK | TAM; VHM | INT |
| 98 | Kuo, Wu, and Deng (2009) | Survey of 387 university students in Taiwan | *SCM* | INT |
| 99 | Larsen et al. (2009) | Survey of 135 faculty members in Norway | ECT; TTF | INT |
| 100 | Lee et al. (2009) | Survey of 478 m-Data Service uses in SK | TFT | USAGE |
| 101 | Lu et al. (2009) | Survey of 337 airline customers in Taiwan | TAM+ | INT |
| 102 | Qureshi et al. (2009) | Survey of 745 staff, faculty and students in NZ & Ireland | *SCM* | INT |
| 103 | Sørebø, Halvari, Gulli, and Kristiansen (2009) | Survey of 124 faculty members in Norway | ECT+ | INT |
| 104 | Tao, Cheng, and Sun (2009) | Survey of 185 university students in Taiwan | TAM; ECT; AT | INT |
| 105 | Chiu and Wang (2008) | Survey of 286 university students in Taiwan | UTAUT+ | INT |
| 106 | Hung and Cho (2008) | Survey of 682 university students in HK | *SCM* | USAGE |
| 107 | Jones, Zmud, and Clark (2008) | Multi-method study (Survey and focus group) with 104 employees in USA | *SCM* | USAGE |
| 108 | Kim, Lee, and Kim (2008) | Nationwide Survey of 3559 m-Date Service users in SK | *SCM* | INT |
| 109 | Koivumäki, Ristola, and Kesti (2008) | Survey of 610 m-services users in Finland | UTAUT | INT |
| 110 | Limayem and Cheung (2008) | Survey of 505 university students in USA | ECT+ | INT |
| 111 | Lin and Huang (2008) | Survey of 192 knowledge management system users in Taiwan | TTF; SCT | USAGE |
| 112 | Lin and Shih (2008) | Survey of 433 m-Commerce consumers in Taiwan | *SCM* | INT |
| 113 | Premkumar and Bhattacherjee (2008) | Survey of 175 university students in USA | TAM; EDT | INT |
| 114 | Roca and Gagné (2008) | Survey of 166 workers in multiple countries | TAM; SDT | INT |
| 115 | Saeed and Abdinnour-Helm (2008) | Survey of 1032 university students in USA | TAM; ISSM | USAGE |
| 116 | Vatanasombut et al. (2008) | Survey of 1004 online Banking users in USA | CTT | INT |
| 117 | Wei and Zhang (2008) | Survey of 279 university students in China | TAM; SLT | INT |
| 118 | Chen (2007) | Survey of 360 members of a professional virtual community in Taiwan | *SCM* | INT |
| 119 | Chiu, Chiu, and Chang (2007) | Survey of 289 web-based learning students in Taiwan | ISSM; FT | INT |

(*continued*)

| S. No. | Citation | Methodology, participants and location | M/T/F | DV |
|---|---|---|---|---|
| 120 | Chiu, Sun, Sun, and Ju (2007) | Survey of 202 web-based learning students in Taiwan | STV; FT | INT |
| 121 | Eriksson and Nilsson (2007) | Survey of 1831 net banking users in Estonia | *SCM* | USAGE |
| 122 | Frambach et al. (2007) | Multimethod study (interview & focus group) with 300 users at various locations | Nil | INT |
| 123 | Hsieh and Wang (2007) | Survey of 200 employees in a large manufacturing firm in China | TAM; ECT | USAGE |
| 124 | Khalifa and Liu (2007) | Survey of 122 e-shopping customers in USA | CT | INT |
| 125 | Kim and Kwahk (2007) | Survey of 290 university students in Singapore | *SCM* | USAGE |
| 126 | Lee et al. (2007) | Large-scale on-line surveys of 5121 m-Internet users in SK, HK & Taiwan | IT; CLM | INT |
| 127 | Liao et al. (2007) | Survey of 469 university students in Taiwan | EDM; TPB | INT |
| 128 | Park et al. (2007) | Survey of 191 university students in USA | TAM+ | INT |
| 129 | Yao, Palmer, and Dresner (2007) | Survey of 183 manufacturers, distributors, and retailers in USA | *SCM* | USAGE |
| 130 | Hong et al. (2006) | Survey of 1826 m-internet users/members in HK | TAM; ECM; TAM+ECM | INT |
| 131 | Hsu, Yen, Chiu, and Chang (2006) | Survey of 201 university students in Taiwan | TPB+ | INT |
| 132 | Li et al. (2006) | Survey of 335 university students in HK | *SCM* | INT |
| 133 | Mallat et al. (2006) | Survey of 360 citizens in Finland | TAM; DIT | INT |
| 134 | Roca, Chiu, and Martínez (2006) | Survey 172 workers at multiple locations | TAM+ | INT |
| 135 | THong et al. (2006) | Survey of 811 m-internet services users in HK | ECM+ | INT |
| 136 | Wang et al. (2006) | Survey of 258 m-service users in Taiwan | TAM; TPB, MBAM | INT |
| 137 | Cheung and Huang (2005) | Survey of 328 university students in USA | TAM; TRA; IDT | USAGE |
| 138 | Chiu et al. (2005) | Survey of 183 university students in Taiwan | EDT+ | INT |
| 139 | Lin and Wang (2005) | Survey of 258 m-Commerce users in Taiwan | TAM;TPB | INT |
| 140 | Nysveen et al. (2005a) | Survey of 684 m-Chat service users in Norway | TAM; TRA | INT |
| 141 | Nysveen, Pedersen, and Thorbjørnsen (2005b) | Survey of 2038 upper secondary school students in Norway | TAM+ | INT |
| 142 | Zhu and Kraemer (2005) | Survey 624 employees at multi locations | TOEF; RBT | USAGE |
| 143 | Bhattacherjee and Premkumar (2004) | Two longitudinal studies involving 400 students in USA | EDT+ | INT |
| 144 | Chu, Hsiao, Lee, and Chen (2004) | Survey of 158 public officials in Taiwan | TPB | INT |
| 145 | Hsu and Chiu (2004) | Field Survey of 149 e-tax filing service users in Taiwan | DTPB | INT |
| 146 | Hsu and Lu (2004) | Survey of 233 online game users in Taiwan | TAM+ | INT |
| 147 | Van der Heijden (2003) | Survey of 828 Dutch generic portal site users in Netherlands | TAM+ | INT |
| 148 | Yi and Hwang (2003) | Survey of 109 blackboard class management system users in USA | TAM+ | INT |
| 149 | Zhu and He (2002) | Survey of 2664 citizens in China | *SCM* | USAGE |
| 150 | Ang, Davies, and Finlay (2001) | Survey of 42 public agencies in Malaysia | *SCM* | USAGE |
| 151 | Bhattacherjee (2001a, 2001b) | Survey of 172 online brokerage users in USA | ECT | INT |
| 152 | Karahanna and Limayem (2000) | Survey of 384 users at a large financial institution in USA | TAM+ | USAGE |

SET – Social Exchange Theory; SCM – Self-constructed Model; TAM – Technology Acceptance Model; U&GT – U&G Theory; FT – Flow Theory; MECT – Means-end Chain Theory; PT – Prospect Theory; SRF – Self-regulation Framework; IDT – Innovation Diffusion Theory; UTAUT – Unified Theory of Acceptance and Use of Technology; ISSM – Information Systems Success Model; TPB – Theory of Planned Behaviour; ECM/T – Expectation-confirmation Model/Theory; MT – Motivation Theory; PPMF – Push–Pull–Mooring Framework; TTF – Task-Technology Fit; MT – Motivation Theory; NE – Network Externalities; TRA – Theory of Reasoned Action; AERCF – Appraisal-emotional Response-coping Framework; VF – Valence Framework; TOE Framework; EDM/T – Expectation-disconfirmation Model/Theory; SQBT – Status Quo Bias Theory; CDT – Cognitive Dissonance Theory; SCT – Social Capital Theory; AT – Agency Theory; TFT – Two-factor Theory; VHM – Van der Heijden's Model; CTT – Commitment–Trust Theory; SCT – Social Cognitive Theory; SLT – Social Learning Theory; SDT – Self-determination Theory; CT – Contingency Theory; IT – Interaction Theory; CLM – Cultural Lens Model; STV – Subjective Task Value; MBAM – M-banking Acceptance Model; TOEF – TOE Framework; RBT – Resource-Based Theory; DTPB – Decomposed Theory of Planned Behaviour; ISCT – Information Systems Continuous Theory.

* Laddering interviews (Gutman, 1982).

** Computer Assisted Telephone Interviewing (CATI); HK – Hong Kong; SK – South Korea; NZ – New Zealand; SA – Saudi Arabia; M/T/F – Model/Theory/Framework Used; ATT – Attitude; INT – Intention; DV – Dependent Variable.

**Appendix C. Summary of the domain-specific distribution of articles on IT/SCU**

| S. No. | No. of articles | Year | Citation | Database | Journal | Technology |
|---|---|---|---|---|---|---|
| *Domain1_Continuous Usage of Mobile Information Systems (CUMIS)* | | | | | | |
| 1 | 1 | 2014 | Jung (2014) | Wiley | Information Systems Journal | M-Phones |
| 2 | 2 | 2014 | Wang (2014) | ScienceDirect | Computers in Human Behavior | M-Government (m-Tax Message Platform) |
| 3 | 3 | 2013 | Zhou (2013a) | SAGE | Information Development | M-Internet |
| 4 | 4 | 2013 | Zhou (2013b) | ScienceDirect | Decision Support Systems | M-Payments |
| 5 | 5 | 2013 | Zhou (2013c) | Inderscience | International Journal of Mobile Communications | M-Internet |
| 6 | 6 | 2012 | Reji Kumar and Ravindran (2012) | EBSCOHost | Journal of Internet Banking & Commerce | M-Banking |
| 7 | 7 | 2012 | Chen (2012) | Inderscience | International Journal of Mobile Communications | M-Banking |
| 8 | 8 | 2012 | Kang et al. (2012) | Taylor & Francis | Journal of Organizational Computing and E-Commerce | M-Banking |
| 9 | 9 | 2012 | Kim (2012) | ScienceDirect | Telecommunications Policy | M-Data Services & Applications (Apps Store) |
| 10 | 10 | 2012 | Kim and Hwang (2012) | Springer | Information Systems Frontiers | M-Internet |
| 11 | 11 | 2012 | Tojib and Tsarenko (2012) | ScienceDirect | Journal of Business Research | M-Services |
| 12 | 12 | 2011 | Park et al. (2011) | EBSCOHost | Journal of Electronic Commerce Research | M-Services |
| 13 | 13 | 2011 | Zhou (2011b) | Taylor & Francis | Behaviour and Information Technology | M-Services |
| 14 | 14 | 2011 | Choi et al. (2011) | ScienceDirect | Journal of Business Research | M-Data Services |
| 15 | 15 | 2011 | Lee (2011) | ScienceDirect | Computers in Human Behavior | M-Data Services |
| 16 | 16 | 2011 | Zhou and Lu (2011) | Taylor & Francis | International Journal of Human–Computer Interaction | M-Internet |
| 17 | 17 | 2011 | Liang and Yeh (2011) | Springer | Personal and Ubiquitous Computing | M-Games |
| 18 | 18 | 2011 | Zhou (2011a) | SAGE | Information Development | M-Internet |
| 19 | 19 | 2011 | Lu et al. (2011) | ScienceDirect | Information and Management | M-Payments |
| 20 | 20 | 2010 | Deng et al. (2010) | Palgrave | European Journal of Information Systems | M-Internet |
| 21 | 21 | 2010 | Kim et al. (2010) | Inderscience | International Journal of Mobile Communications | M-Internet |
| 22 | 22 | 2010 | Chang (2010) | Inderscience | International Journal of Mobile Communications | M-Phones |
| 23 | 23 | 2010 | Ng and Kwahk (2010) | Inderscience | International Journal of Mobile Communications | M-Internet |
| 24 | 24 | 2010 | Lu et al. (2010) | Wiley | Information Systems Journal | M-Short Message Service (SMS) |
| 25 | 25 | 2010 | Verkasalo et al. (2010) | ScienceDirect | Telematics and Informatics | M-Applications (Internet/ Mapping/Games) |
| 26 | 26 | 2010 | Shin et al. (2010) | Springer | Information Systems Frontiers | M-Internet |
| 27 | 27 | 2009 | Kim, Shin, et al. (2009) | Wiley | Information Systems Journal | M-Banking |
| 28 | 28 | 2009 | Kuo et al. (2009) | ScienceDirect | Computers in Human Behavior | M-Services |
| 29 | 29 | 2009 | Kim, Choi, et al. (2009) | ScienceDirect | Expert Systems with Applications | M-Data Service |
| 30 | 30 | 2009 | Gu et al. (2009) | ScienceDirect | Expert Systems with Applications | M-Banking |
| 31 | 31 | 2009 | Lee et al. (2009) | EBSCOHost | Journal of the Association for Information Systems | M-Data Service |
| 32 | 32 | 2008 | Lin and Shih (2008) | Inderscience | International Journal of Mobile Communications | M-Commerce |

(*continued*)

| S. No. | No. of articles | Year | Citation | Database | Journal | Technology |
|---|---|---|---|---|---|---|
| 33 | 33 | 2008 | Kim et al. (2008) | Inderscience | International Journal of Mobile Communications | M-Data Services |
| 34 | 34 | 2008 | Koivumäki et al. (2008) | ACM | Personal and Ubiquitous Computing | M-Services |
| 35 | 35 | 2007 | Lee et al. (2007) | M.E.Sharpe | International Journal of Electronic Commerce | M-Internet |
| 36 | 36 | 2007 | Kim and Kwahk (2007) | IEEE | Proceedings | M-Internet |
| 37 | 37 | 2006 | THong et al. (2006) | ScienceDirect | International Journal of Human–Computer Studies | M-Internet |
| 38 | 38 | 2006 | Mallat et al. (2006) | IEEE | Proceedings | M-Ticketing |
| 39 | 39 | 2006 | Hong et al. (2006) | ScienceDirect | Decision Support Systems | M-Internet |
| 40 | 40 | 2006 | Wang et al. (2006) | Wiley | Information Systems Journal | M-Services |
| 41 | 41 | 2005 | Lin and Wang (2005) | IEEE | Proceedings | M-Commerce |
| 42 | 42 | 2005 | Nysveen et al. (2005a) | Emerald | Journal of Consumer Marketing | M-Chat Services |
| 43 | 43 | 2005 | Nysveen et al. (2005b) | SAGE | Journal of the Academy of Marketing Science | M-Services |
| *Domain2_Continuous Usage of Electronic Business Information Systems (CUEBIS)* | | | | | | |
| 44 | 1 | 2014 | Chiu et al. (2014) | Wiley | Information Systems Journal | E-Commerce (B2C) |
| 45 | 2 | 2014 | Hartono et al. (2014) | ScienceDirect | Decision Support Systems | E-Commerce (B2C) |
| 46 | 3 | 2013 | Saraf et al. (2013) | Wiley | Information Systems Journal | ERP Systems |
| 47 | 4 | 2013 | Veiga et al. (2013) | Palgrave | European Journal of Information Systems | Enterprise Systems |
| 48 | 5 | 2013 | Yim et al. (2013) | Emerald | Journal of Business and Industrial Marketing | Supply Chain Management |
| 49 | 6 | 2012 | Hoehle, Huff, et al. (2012) | EBSCOHost | Journal of Computer Information Systems | Internet Banking |
| 50 | 7 | 2012 | Chiu et al. (2012) | ScienceDirect | Decision Support Systems | E-Purchase |
| 51 | 8 | 2012 | Al-Maghrabi and Dennis (2012) | Inderscience | International Journal of Business Information Systems | E-Shopping (E-retailer) |
| 52 | 9 | 2012 | Pi et al. (2012) | EBSCOHost | International Journal of Business & Management | E-Stock Trading |
| 53 | 10 | 2011 | Pai and Tu (2011) | ScienceDirect | Expert Systems with Applications | CRM System |
| 54 | 11 | 2011 | Venkatesh et al. (2011) | Wiley | Information Systems Journal | E-Government |
| 55 | 12 | 2011 | Hernández-Ortega (2011) | ScienceDirect | Technovation | E-Invoicing |
| 56 | 13 | 2011 | Lee et al. (2011) | EBSCOHost | Journal of Educational Technology and Society | E-Learning/Knowledge Management System For Employees |
| 57 | 14 | 2011 | Cheng (2011) | Wiley | Information Systems Journal | E-Learning/Knowledge Management System For Employees |
| 58 | 15 | 2011 | Al-Maghrabi and Dennis (2011) | Emerald | Journal of Retail & Distribution Management | E-Shopping |
| 59 | 16 | 2011 | Al-Maghrabi et al. (2011) | Emerald | Journal of Enterprise Information Management | E-Shopping |
| 60 | 17 | 2011 | Rodon et al. (2011) | Wiley | Information Systems Journal | Inter-organization Information System |
| 61 | 18 | 2011 | Li et al. (2011) | EBSCOHost | Journal of the Association for Information Systems | Online Direct Sales Channels (ODSC) |
| 62 | 19 | 2010 | Bock et al. (2010) | Taylor & Francis | Journal of Organizational Computing and E-Commerce | E-Knowledge Repositories (EKR) |
| 63 | 20 | 2010 | Zhai (2010) | IEEE | Proceedings | E-Marketplace (B2B) |
| 64 | 21 | 2010 | Wang and Lin (2010) | IEEE | Proceedings | E-Knowledge Groups (Professional Technology Temple) |
| 65 | 22 | 2010 | Lin and Bhattacherjee (2010) | Wiley | Information Systems Journal | Online Video Games (OVGs) |

(*continued on next page*)

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| S. No. | No. of articles | Year | Citation | Database | Journal | Technology |
|---|---|---|---|---|---|---|
| 66 | 23 | 2010 | Park et al. (2010) | ScienceDirect | Electronic Commerce Research and Applications | Web Analytics Services |
| 67 | 24 | 2009 | Hu et al. (2009) | Wiley | J. of the American Society for Info. Science and Tech. | E-Government |
| 68 | 25 | 2009 | Qureshi et al. (2009) | Palgrave | European Journal of Information Systems | E-Shopping |
| 69 | 26 | 2009 | Chiu, Lin, et al. (2009) | Taylor & Francis | Behaviour and Information Technology | E-Shopping |
| 70 | 27 | 2009 | Chiu, Chang, et al. (2009) | Emerald | Online Information Review | E-Shopping |
| 71 | 28 | 2009 | Chou and Chen (2009) | ScienceDirect | International Journal of Human–Computer Studies | ERP Systems |
| 72 | 29 | 2009 | He et al. (2009) | ScienceDirect | Information and Management | Knowledge Management Systems For Employees |
| 73 | 30 | 2009 | Lu et al. (2009) | ScienceDirect | Logistics and Transportation Review | Self Check-in (Airline) |
| 74 | 31 | 2008 | Roca and Gagné (2008) | ScienceDirect | Computers in Human Behavior | E-Learning For Employees |
| 75 | 32 | 2008 | Jones et al. (2008) | EBSCOHost | Communications of the Association for IS | ERP Systems |
| 76 | 33 | 2008 | Lin and Huang (2008) | ScienceDirect | Information and Management | Knowledge Management Systems For Employees |
| 77 | 34 | 2008 | Vatanasombut et al. (2008) | ScienceDirect | Information and Management | Online Banking |
| 78 | 35 | 2007 | Frambach et al. (2007) | Wiley | Journal of Interactive Marketing | E-Financial Services (Mortgage) |
| 79 | 36 | 2007 | Khalifa and Liu (2007) | Palgrave | European Journal of Information Systems | E-Shopping |
| 80 | 37 | 2007 | Yao et al. (2007) | ScienceDirect | Decision Support Systems | Electronically-enabled Supply Chains (ESCs) |
| 81 | 38 | 2007 | Hsieh and Wang (2007) | Palgrave | European Journal of Information Systems | ERP Systems |
| 82 | 39 | 2007 | Eriksson and Nilsson (2007) | ScienceDirect | Technovation | Internet Banking |
| 83 | 40 | 2006 | Li et al. (2006) | Wiley | Decision Sciences | E-Commerce |
| 84 | 41 | 2006 | Roca et al. (2006) | ScienceDirect | International Journal of Human–Computer Studies | E-Learning System For Employees |
| 85 | 42 | 2006 | Hsu et al. (2006) | ScienceDirect | International Journal of Human–Computer Studies | E-Shopping (PChome Shopping Store) |
| 86 | 43 | 2005 | Zhu and Kraemer (2005) | INFORMS | Information Systems Research | E-Business |
| 87 | 44 | 2004 | Chu et al. (2004) | ScienceDirect | Government Information Quarterly | E-Government |
| 88 | 45 | 2004 | Hsu and Lu (2004) | ScienceDirect | Information and Management | Online Games |
| 89 | 46 | 2004 | Hsu and Chiu (2004) | Taylor & Francis | Behaviour and Information Technology | Web-based Tax Filing Service |
| 90 | 47 | 2001 | Bhattacherjee (2001a, 2001b) | ScienceDirect | Decision Support Systems | E-Commerce (Online Brokerage) |
| 91 | 48 | 2001 | Ang et al. (2001) | ScienceDirect | Journal of Strategic Information Systems | Total Quality Management |
| 92 | 49 | 2000 | Karahanna and Limayem (2000) | Taylor & Francis | Journal of Organizational Computing and E-Commerce | E-Mail/Voice Mail |
| *Domain3_Continuous Usage of Social Information Systems (CUSIS)* | | | | | | |
| 93 | 1 | 2014 | Park (2014) | ScienceDirect | Information Processing and Management | Social Networking Sites (SNS) |
| 94 | 2 | 2014 | Lin et al. (2014) | ScienceDirect | Information and Management | SNS (Facebook) |
| 95 | 3 | 2014 | Huang et al. (2014) | ScienceDirect | Information and Management | SNS (Facebook) |
| 96 | 4 | 2014 | Zhou et al. (2014) | ScienceDirect | Decision Support Systems | Social Virtual World (SVW) |
| 97 | 5 | 2013 | Chang (2013a) | ScienceDirect | Telematics and Informatics | Social Network Games (Facebook) |
| 98 | 6 | 2013 | Ko (2013) | ScienceDirect | Electronic Commerce Research and Applications | SNS (Bloggers) |

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| S. No. | No. of articles | Year | Citation | Database | Journal | Technology |
|---|---|---|---|---|---|---|
| 99 | 7 | 2013 | Kang et al. (2013) | ScienceDirect | International Journal of Information Management | SNS (Cyworld) |
| 100 | 8 | 2013 | Hsu et al. (2014) | Springer | Information Systems and e-Business Management | SNS (Facebook) |
| 101 | 9 | 2013 | Al-Debei et al. (2013) | ScienceDirect | Decision Support Systems | SNS (Facebook) |
| 102 | 10 | 2013 | Wu et al. (2013) | Springer | Information Systems and e-Business Management | SNS (Facebook) |
| 103 | 11 | 2012 | Chang and Zhu (2012) | ScienceDirect | Computers in Human Behavior | SNS |
| 104 | 12 | 2012 | Hsieh et al. (2012) | ScienceDirect | Computers in Human Behavior | SNS (Bloggers) |
| 105 | 13 | 2012 | Chen et al. (2012) | ScienceDirect | Computers in Human Behavior | SNS (Web 2.0) |
| 106 | 14 | 2012 | Verhagen et al. (2012) | ScienceDirect | Computers in Human Behavior | Social Virtual World (Second Life) |
| 107 | 15 | 2012 | Ham et al. (2012) | IEEE | Proceedings | Virtual Communities |
| 108 | 16 | 2011 | Shin and Shin (2011) | ScienceDirect | Computers in Human Behavior | Social Network Games (SNGs) |
| 109 | 17 | 2011 | Chang and Zhu (2011) | ScienceDirect | Computers in Human Behavior | SNS |
| 110 | 18 | 2011 | Lin and Lu (2011) | ScienceDirect | Computers in Human Behavior | SNS (Facebook) |
| 111 | 19 | 2011 | Sánchez-Franco et al. (2011) | ScienceDirect | Procedia-Social and Behavioral Sciences | SNS (Facebook) |
| 112 | 20 | 2011 | Mäntymäki and Salo (2011) | ScienceDirect | Computers in Human Behavior | Social Virtual World (Habbo) |
| 113 | 21 | 2011 | Jung (2011) | Wiley | Journal of Computer-Mediated Communication | Social Virtual World (Second Life) |
| 114 | 22 | 2011 | Barnes (2011) | ScienceDirect | Information and Management | Social Virtual World (Second Life) |
| 115 | 23 | 2010 | Jin et al. (2010) | Taylor & Francis | Behaviour and Information Technology | Online Communities (BBS-China) |
| 116 | 24 | 2010 | Kang and Lee (2010) | ScienceDirect | Computers in Human Behavior | SNS (Cyworld) |
| 117 | 25 | 2010 | Shi et al. (2010) | IEEE | Proceedings | SNS (Facebook) |
| 118 | 26 | 2010 | Park and Lee (2010) | Springer | U-and E-Service, Science and Technology | SNS (Twitter) |
| 119 | 27 | 2010 | Mäntymäki and Merikivi (2010) | IEEE | Proceedings | Social Virtual World (Habbo) |
| 120 | 28 | 2010 | Fang and Chiu (2010) | ScienceDirect | Computers in Human Behavior | Virtual Communities of Practice (JavaWorld@TW) |
| 121 | 29 | 2009 | Kang et al. (2009) | ScienceDirect | Computers in Human Behavior | SNS (Cyworld) |
| 122 | 30 | 2007 | Chen (2007) | SAGE | Journal of Information Science | Professional Virtual Communities |
| 123 | 31 | 2003 | Van der Heijden (2003) | ScienceDirect | Information and Management | Website (Dutch Generic Portal) |
| *Domain4_Continuous Usage of Electronic Learning Information Systems (CUELIS)* | | | | | | |
| 124 | 1 | 2014 | Agudo-Peregrina et al. (2014) | ScienceDirect | Computers in Human Behavior | E-Learning System |
| 125 | 2 | 2014 | Najmul Islam (2014) | ScienceDirect | Computers in Human Behavior | Learning Management System (Moodle) |
| 126 | 3 | 2013 | Stone and Baker-Eveleth (2013) | ScienceDirect | Computers in Human Behavior | E-Textbooks (E-texts) |
| 127 | 4 | 2012 | Chang (2013b) | Emerald | Library Management | E-Learning System for Students |
| 128 | 5 | 2012 | Lin (2012) | ScienceDirect | International Journal of Human–Computer Studies | Virtual Learning System for Students |
| 129 | 6 | 2011 | Lin (2011) | ScienceDirect | Computers and Education | E-Learning (Cyber University) |
| 130 | 7 | 2011 | Hung et al. (2011) | ScienceDirect | Computers and Education | E-Learning System (Wisdom Master) |
| 131 | 8 | 2011 | Limayem and Cheung (2011) | Taylor & Francis | Behaviour and Information Technology | Internet-based learning (Blackboard) |
| 132 | 9 | 2011 | Saeed and Abdinnour-Helm (2011) | Wiley | Information Systems Journal | Student Information System |
| 133 | 10 | 2010 | Ramayah et al. (2010) | ScienceDirect | Procedia-Social and Behavioral Sciences | E-Learning System |
| 134 | 11 | 2010 | Lee (2010) | ScienceDirect | Computers and Education | E-Learning System |
| 135 | 12 | 2009 | Tao et al. (2009) | ScienceDirect | Computers and Education | Business Simulation Games For Students |
| 136 | 13 | 2009 | Sørebø et al. (2009) | ScienceDirect | Computers and Education | E-Learning Technology |

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| S. No. | No. of articles | Year | Citation | Database | Journal | Technology |
|---|---|---|---|---|---|---|
| 137 | 14 | 2009 | Larsen et al. (2009) | ScienceDirect | Computers in Human Behavior | E-Learning Tool |
| 138 | 15 | 2008 | Premkumar and Bhattacherjee (2008) | ScienceDirect | Omega | Computer-Based Tutorial |
| 139 | 16 | 2008 | Hung and Cho (2008) | Wiley | International Journal of Training and Development | E-Learning Communication Tool (WebCT) |
| 140 | 17 | 2008 | Wei and Zhang (2008) | EBSCOHost | Information Research | Internet Knowledge and Use |
| 141 | 18 | 2008 | Limayem and Cheung (2008) | ScienceDirect | Information and Management | Internet-based Learning Technology (Blackboard) |
| 142 | 19 | 2008 | Chiu and Wang (2008) | ScienceDirect | Information and Management | Web-based Learning |
| 143 | 20 | 2008 | Saeed and Abdinnour-Helm (2008) | ScienceDirect | Information and Management | Web-based Student Information System |
| 144 | 21 | 2007 | Liao et al. (2007) | ScienceDirect | Computers in Human Behavior | Cyber University System (CUS) |
| 145 | 22 | 2007 | Park et al. (2007) | Wiley | Journal of Computer-Mediated Communication | E-Courseware |
| 146 | 23 | 2007 | Chiu, Chiu, et al. (2007) | Wiley | Information Systems Journal | Web-based Learning Program |
| 147 | 24 | 2007 | Chiu, Sun, et al. (2007) | ScienceDirect | Computers and Education | Web-based Learning Program |
| 148 | 25 | 2005 | Cheung and Huang (2005) | Wiley | British Journal of Educational Technology | E-Learning |
| 149 | 26 | 2005 | Chiu et al. (2005) | ScienceDirect | Computers and Education | E-Learning |
| 150 | 27 | 2004 | Bhattacherjee and Premkumar (2004) | JSTOR | MIS Quarterly | Computer based Training Software |
| 151 | 28 | 2003 | Yi and Hwang (2003) | ScienceDirect | International Journal of Human–Computer Studies | Web-based Class Management System (Blackboard) |
| 152 | 29 | 2002 | Zhu and He (2002) | SAGE | Communication Research | Internet Usage |

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# II

## MOBILE BANKING ADOPTION: A LITERATURE REVIEW

by

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# Mobile banking adoption: A literature review

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ABSTRACT

Electronic commerce (e-commerce) continues to have a profound impact on the global business environment, but technologies and applications also have begun to focus more on mobile computing, the wireless Web, and mobile commerce. Against this backdrop, mobile banking (m-banking) has emerged as an important distribution channel, with considerable research devoted to its adoption. However, this research stream has lacked a clear roadmap or agenda. Therefore, the present article analyzes and synthesizes existing studies of m-banking adoption and maps the major theories that researchers have used to predict consumer intentions to adopt it. The findings indicate that the m-banking adoption literature is fragmented, though it commonly relies on the technology acceptance model and its modifications, revealing that compatibility (with lifestyle and device), perceived usefulness, and attitude are the most significant drivers of intentions to adopt m-banking services in developed and developing countries. Moreover, the extant literature appears limited by its narrow focus on SMS banking in developing countries; virtually no studies address the use of m-banking applications via smartphones or tablets or consider the consequences of such usage. This study makes several recommendations for continued research in the area of mobile banking.



**Contents**



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## 1. Introduction

Mobile banking (m-banking) is among the latest in a series of recent mobile technological wonders. Although automated teller machine (ATM), telephone, and Internet banking offer effective delivery channels for traditional banking products, but as the newest delivery channel established by retail and microfinance banks in many developed and developing countries, m-banking is likely to have significant effects on the market (Safeena et al., 2012). In particular, the expanded uses of smartphones has increased demand for m-banking services, prompting many more banks, microfinance institutions, software houses, and service providers to offer this innovative service together with new sets of products and applications designed to extend their client reach (including to unbanked populations), improve customer retention, enhance operational efficiency, increase market share, and provide new employment opportunities (Shaikh, 2013).

Despite such benefits, the use of mobile phones or tablets to conduct banking transactions or access financial information is not as widespread as might be expected (e.g., Dineshwar and Steven, 2013; Luarn and Lin, 2005; Shih et al., 2010), as demonstrated by popular media reports (e.g., Accenture, 2013). Juniper Research (2013) has revealed that more than 1 billion people are expected to use m-banking globally by 2017, but that level represents only 15% of the global mobile subscription base—a base that accounts for approximately 96% of the world's population (International Telecommunication Union, 2011). In addition, approximately half of all mobile subscribers remain unbanked, with limited access to traditional financial services, as Table 1 reveals.

These trends suggest that significant growth opportunities remain, leading to predictions of potentially massive increases in the number of m-banking users. These figures also warrant further investigations of any persistent adoption issues in m-banking, especially in the case of mobile subscribers.

Several studies analyze m-banking and associated factors that influence consumers' adoption of it, using both qualitative and quantitative methods. Despite considerable research on m-banking adoption that has appeared in international journals across disciplines, a review of literature on m-banking adoption remains missing. Such a review represents an important milestone in the development of a research field. It provides an opportunity to step back and review the collective intelligence that has been amassed from an eclectic body of research that uses various samples, methods, and theories. This effort is particularly important when the findings of isolated studies contradict one another (Hanafizadeh et al., 2014). This study accordingly seeks to extend the understanding of mobile technologies by undertaking a detailed review of m-banking adoption.

Considering the complexity of mobile technology and the variety of services being offered, this study seeks to contribute to the m-banking literature by exploring and analyzing the current state of knowledge on m-banking and its adoption across various strata of populations living in both developed and developing countries. In so doing, it can unify and synthesize disparate streams of research into a more coherent body of knowledge, as well as identify and discuss the methodologies, frameworks, and models applied in this field. Finally, this study summarizes the major findings and identifies gaps that demand further research. For these efforts, this study relies on the term "participant" to denote the unit of analysis used in any reviewed study. Only factors or antecedents that determine m-banking adoption, pre-adoption, or acceptance appear in this review.

The next section contains a brief overview of m-banking and its definition. After presenting the research methodology, this article outlines the results of the analysis, some conclusions and limitations, and finally, recommendations for research.

## 2. M-banking

M-banking dates back to the end of the 1990s when the German company Paybox, in collaboration with Deutsche Bank, launched the first service. Initially, it was deployed and tested mostly in European countries: Germany, Spain, Sweden, Austria, and the United Kingdom. Among developing countries, Kenya was the first to introduce a text-based m-banking service, M-Pesa, in 2007. By 2012, there were more than seven million registered M-Pesa users in Kenya. As Veijalainen et al. (2006) argue, the main driving force for the rapid acceptance of small mobile devices is the capability they offer for obtaining services and running applications at any time and any place, including while on the move.

**Table 1**
M-banking users (International Telecommunication Union, 2011).

| | | |
|---|---|---|
| Global population | 7.100 billion | 100% |
| Mobile phone subscription | 6.835 billion | 96% |
| M-banking accounts/users | 0.590 billion | **8.6%** |

**Table 2**
Main services offered through m-banking.

| Financial services | Non-financial services |
|---|---|
| Bill payments | Balance enquiry |
| Peer-to-peer payments | Mini-bank statement |
| Fund transfers | PIN change |
| Remittance | Checkbook request |
| Shopping and donations | Due alerts for payments |
| Mobile balance recharge | Locate ATMs |

Researchers use various terms to refer to mobile banking, including m-banking (Liu et al., 2009), branchless banking (Ivatury and Mas, 2008), m-payments, m-transfers, m-finance (Donner and Tellez, 2008), or pocket banking (Amin et al., 2006). As an important component of electronic banking, m-banking usually constitutes an alternative delivery channel (ADC) for various financial and non-financial transactions, as summarized in Table 2. Other prominent ADCs include ATMs, point-of-sale terminals, interactive voice response, mobile phones, and the Internet.

Regardless of the terminology they use, scholars generally define m-banking as an application of m-commerce that enables customers to access bank accounts through mobile devices to conduct transactions such as checking account status, transferring money, making payments, or selling stocks (e.g., Alafeef et al., 2012; Harma and Dubey, 2009; Lee and Chung, 2009). In addition, a few studies (e.g., Akturan and Tezcan, 2012; Masrek et al., 2012; Shih et al., 2010) cite m-banking as an innovative communication channel in that the customer interacts with a bank through a portable device.

However, the dynamic markets for mobile devices and m-banking suggest the need for a fresh definition that captures recent advances in the field. Previous definitions have not, for example, explicitly stated which mobile devices qualify for use under the term m-banking. Nevertheless, accessing banking services from a laptop should not be considered m-banking, since their user interface is similar to that of desktop PCs. Laptops are aligned with the online/Internet banking category rather than with m-banking. This study accordingly proposes the following definition of m-banking:

> A product or service offered by a bank or a microfinance institute (bank-led model) or MNO (non-bank-led model) for conducting financial and non-financial transactions using a mobile device, namely a mobile phone, smartphone, or tablet.

Cruz et al. (2010) identify the difference between m-banking and m-payments and argue that, if a bank is not directly involved in the instrumental gratification of a service offered, it is usually called a "mobile payment (m-payment)." Examples of such services include payments through overhead-priced SMS (e.g., ring tones) prepaid account loading (e.g., used for cinema tickets), or a charge made to the subscriber's account (e.g., credit card or invoice-based payment mechanism).

From the m-banking service perspective, the ecosystem depicted in Fig. 1 comprises several applications, channels, and methods for conducting m-banking, as well as major services offered through m-banking channels.

Retail and microfinance banks located in both developed and developing countries typically offer four points of access to m-banking services: (1) mobile applications that can be downloaded to a smartphone, (2) mobile browsers that can be used with any mobile or smartphone that has a Web browser, (3) applications that can be downloaded to a tablet, and (4) short

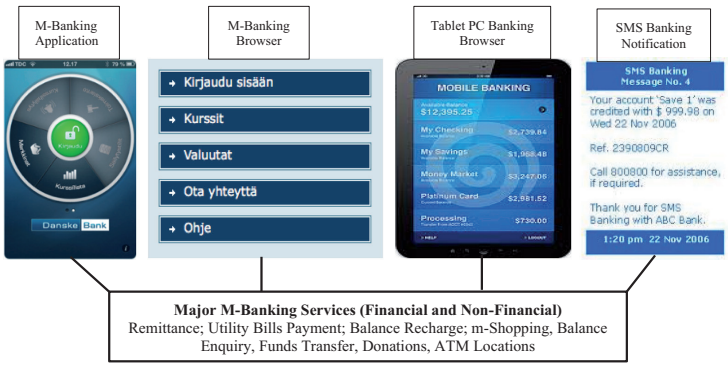


**Fig. 1.** M-banking applications, channels and services.

messaging services (SMS) that provide notifications of account information. The first three routes require an Internet connection on the mobile device; SMS relies on standard Global System for Mobile Communication (GSM) networks. Overall, though, m-banking has changed the financial landscape, and portable devices are now considered ADCs that use different applications to deliver financial and non-financial services and products to consumers.

## 3. Research methodology

The literature search spanned 33 information systems, marketing, and business administration journals, as well as a few records of conference proceedings. To identify published articles pertaining to m-banking adoption, this search involved various databases (e.g., Science Direct, Emerald, IEEE, Inderscience, Taylor & Francis, ACM, Wiley) and multiple relevant key terms, such as mobile banking (m-banking) adoption, mobile banking acceptance, mobile banking adoption intention, mobile banking adoption attitude, mobile banking usage behavior, mobile banking embracing, and mobile banking utilization. The identified articles represented a broad range of scientific, mostly peer-reviewed journals. In addition, the Google search engine revealed other articles that might not have been accessible in the online databases. Initial developments in this research field were heavily influenced by practitioners, so the literature review incorporates both academic sources (peer-reviewed journal publications, working papers, and conference papers) and practitioner sources (non-peer-reviewed consultants) reports and surveys, official reports, journal articles, and other occasional papers) (Duncombe and Boateng, 2009). To ensure the inclusion of current developments, the period reviewed spanned January 2005–March 2014 (Inclusive). The search resulted in 55 relevant publications, of which 48 (87%) were published in scientific journals and seven (13%) were

**Table 3**
Articles on m-banking adoption (January 2005–March 2014).

| | Name of Journals | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | African Journal of Business Management | – | – | – | – | – | – | 1 | – | – | – | 1 | 1.8 |
| 2 | Australian Journal of Basics and Applied Sciences | – | – | – | – | - | - | 1 | – | – | – | 1 | 1.8 |
| 3 | Behavior and Information Technology | – | – | – | – | 1 | 1 | – | – | – | – | 2 | 3.6 |
| 4 | Canadian Journal of Administrative Sciences | – | – | – | – | 1 | – | – | – | – | – | 1 | 1.8 |
| 5 | Computers in Human Behavior | 1 | – | – | – | – | 1 | – | 1 | – | – | 3 | 5.5 |
| | Conference Proceedings | – | – | – | – | 2 | – | 3 | 2 | – | – | 7 | 13 |
| 6 | Decision Support Systems | – | – | – | – | – | 1 | – | – | – | – | 1 | 1.8 |
| 7 | Electronic Commerce Research and Applications | – | – | – | – | – | 1 | – | – | – | – | 1 | 1.8 |
| 8 | Expert Systems with Applications | – | – | – | – | 1 | – | – | – | – | – | 1 | 1.8 |
| 9 | Information Technology Management | – | – | – | – | – | – | – | 1 | – | – | 1 | 1.8 |
| 10 | Info | – | – | – | – | – | – | – | 1 | – | – | 1 | 1.8 |
| 11 | Information Systems Journal | – | – | – | – | 1 | – | – | – | – | – | 1 | 1.8 |
| 12 | International Journal of Mobile Communications | – | – | 1 | - | 1 | 3 | 1 | 1 | – | – | 7 | 13 |
| 13 | Interacting with Computers | – | – | – | – | 1 | – | – | – | – | – | 1 | 1.8 |
| 14 | International Business and Management | – | – | – | – | – | – | – | – | 1 | – | 1 | 1.8 |
| 15 | International Journal of Bank Marketing | – | – | – | – | – | 4 | – | – | – | – | 4 | 7.2 |
| 16 | International Journal of Business and Social Sciences | – | – | – | – | – | – | 1 | – | – | – | 1 | 1.8 |
| 17 | International Journal of Business Research and Development | – | – | – | – | – | – | – | – | 1 | – | 1 | 1.8 |
| 18 | International Journal of Computer Theory and Engineering | – | – | – | – | – | – | – | 1 | – | – | 1 | 1.8 |
| 19 | International Journal of Information Management | – | – | – | – | – | – | 1 | – | – | – | 1 | 1.8 |
| 20 | International Journal of Innovative Research and development | – | – | – | – | – | – | – | – | 1 | – | 1 | 1.8 |
| 21 | International Journal of Multidisciplinary Research | – | – | – | – | – | – | 1 | – | – | – | 1 | 1.8 |
| 22 | International Journal of Trade, Economics and Finance | – | – | – | – | – | – | 1 | – | – | – | 1 | 1.8 |
| 23 | Internationalization, Design and Global Development Lecture Notes in CS | – | – | – | – | 1 | – | – | – | – | – | 1 | 1.8 |
| 24 | Internet Research | – | – | – | – | – | – | 1 | – | – | – | 1 | 1.8 |
| 25 | Journal of Business Administration and Education | – | – | – | – | – | – | – | – | 1 | – | 1 | 1.8 |
| 26 | Journal of Electronic Commerce Research | – | – | – | – | – | – | – | 1 | - | – | 1 | 1.8 |
| 27 | Journal of Internet Banking and Commerce | – | 1 | – | – | – | – | 1 | 1 | – | – | 3 | 5.5 |
| 28 | Marketing Intelligence & Planning | – | – | – | – | – | – | – | 1 | – | – | 1 | 1.8 |
| 29 | Research Journal of Applied Sciences | – | – | – | – | – | – | 1 | – | – | – | 1 | 1.8 |
| 30 | Sunway Academic Journal | – | – | 1 | – | – | – | – | – | – | – | 1 | 1.8 |
| 31 | Telematics and Informatics | – | – | – | – | – | – | – | – | – | 1 | 1 | 1.8 |
| 32 | The Electronic Journal of Information Systems in Developing Countries | – | – | – | – | – | 1 | 1 | – | – | – | 2 | 3.6 |
| 33 | World Journal of Social Sciences | – | – | – | – | – | – | – | – | 1 | – | 1 | 1.8 |
| | Total | 1 | 1 | 2 | 0 | 9 | 12 | 14 | 10 | 5 | 1 | 55 | 100 |

conference publications. These various articles applied different research methods and referred to various geographic regions. Webster and Watson's (2002) classification focused on the model, theory, or framework they used; the constructs analyzed; the geographic location; and the research opportunities they proposed.

## 4. Results

The studies included in this review investigated and identified several influences on consumer adoption behavior toward m-banking. In general, they provided interesting insights into the diffusion pattern of m-banking. For most studies, the underlying objective was to discover deeper motivations and associations that significantly influenced potential adopters' attitudes and intentions across various social systems so that they could articulate behavioral intentions toward mobile banking adoption. Of the 55 studies included in this review, around two-thirds (65%) were published from 2010 to 2012. No study was published in 2008, and only one appeared in 2005 and 2006, with one more in 2014 (see Table 3).

Of the 33 journals that published articles on m-banking adoption, 27 (82%) journals published only one article on m-banking services adoption from January 2005 to March 2014. Further, the *International Journal of Mobile Communications* published the most articles (seven articles, or 13%), followed by the *International Journal of Bank Marketing* (four, or 7%), *Computers in Human Behavior* (three, or 6%), the *Journal of Internet Banking and Commerce* (three, or 6%), and then others combined (37, or 69%).

The studies relied on different methods to collect their empirical data, including survey instruments and interviews, and triangulation was also evident. The average (mean) sample size was 365 consumers. Quantitative research was the most popular method: of 55 studies, 45 (82%) used a quantitative (survey) method to collect data, and only three (5%) employed qualitative methods such as interviews. In addition, five studies (9%) used both qualitative and quantitative methods, and two studies were conceptual in nature. Among the most frequently investigated regions were Southeast Asia (e.g., Malaysia and Singapore), East Asia (e.g., Taiwan, China, and Korea), and Africa (e.g., Ghana, Zimbabwe, and South Africa); a few studies applied to Europe (e.g., Finland, Germany, and Turkey) and South Asia (e.g., India), as Fig. 2 details. The geographic distribution reveals that, of these 55 studies, nine (16%) were conducted in developed countries and the remaining 46 (84%) in developing countries.

During the review process, few constructs were identified that have not been covered in prior research but merit consideration. These constructs include consumer awareness (Dineshwar and Steven, 2013; Jain, 2013; Sharma, 2011), personal involvement (Zhou, 2012b), network externality (Zhou, 2012a), policy and regulatory frameworks (Thulani et al., 2011), experience, and religiosity (Amin and Ramayah, 2010).

Analyzing the acceptance models used by these studies reveals a large and heterogeneous set. In total, 11 technological and social psychological adoption theories, models, and frameworks provided foundations for investigations of the consumer adoption of m-banking services. As Table 4 reveals, some authors used one specific adoption theory or an extension of it, such as the technology acceptance model (TAM) (e.g., Aboelmaged and Gebba, 2013; Chitungo and Munongo, 2013; Safeena et al., 2012), innovation diffusion theory (IDT) (e.g., Kim et al., 2009; Lin, 2011), or the unified theory of acceptance and use of technology (UTAUT) (e.g., Luo et al., 2010; Tan et al., 2010; Yu, 2012). Others combined different theories, such as TAM with the theory of planned behavior (Aboelmaged and Gebba, 2013); TAM and IDT (Ramdhony and Munien, 2013); UTAUT, IDT, and the ubiquitous computing framework (Saeed, 2011); or UTAUT with the task–technology fit (Zhou et al., 2010) model. In addition, a few authors (e.g., Laukkanen and Cruz, 2012; Zhou, 2011) have used self-developed models comprising various constructs.

The results of these various studies suggest some guidance for how to increase m-banking adoption among the different population strata, living in both developed and developing countries (e.g., Saeed, 2011). Several recommendations include

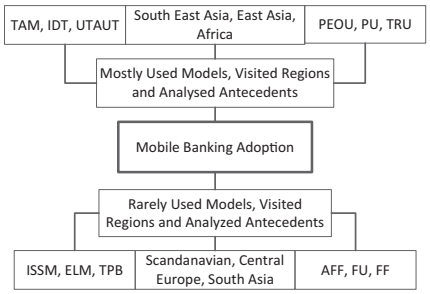


**Fig. 2.** Scope and focus of literature on m-banking adoption.

**Table 4**
Articles included in the review.

| No. | Author(s) | Theories | Significant direct relationships with ATT, INT and USE [a] | Countries and sampling[b] |
|---|---|---|---|---|
| 1 | Hanafizadeh et al. (2014) | TAM+ | PU → INT (0.54); PEOU → INT (0.33); NI → INT (−0.22); RIS → INT (−0.12); COS → INT (−0.10); COM → INT (0.75); TRU → INT (0.62); CRE → INT (0.37) | Iran (361) |
| 2 | Aboelmaged and Gebba (2013) | TAM, TPB | PU → ATT (0.581); ATT → INT (0.351); SI → INT (0.268) | UAE (119) |
| 3 | Ramdhony and Munien (2013) | TAM, IDT | NA | Mauritius (169) |
| 4 | Jain (2013) | SDM | NA | India (100) |
| 5 | Chitungo and Munongo (2013) | TAM2+ | PU → INT (0.337); PEOU → INT (0.155); RA → INT (0.177); PERI → INT (0.101); SI → INT (0. 204); RIS → INT (−0.177); COS → INT (0.146) | Zimbabwe (275) |
| 6 | Huili et al. (2013) | SDM | NA | Conceptual |
| 7 | Zhou (2012b) | ELM | NA | China (240) |
| 8 | Zhou (2012a) | SDM | TRU → INT (0.39); FLOW → INT (0.28); Actual Use → INT (0.69) | China (200) |
| 9 | Tobbin (2012) | TAM | NA | Ghana (69) |
| 10 | Teo et al. (2012) | TAM2 | PU → INT (0.304); PEOU → INT (0.228); SI → INT (0.160) | Malaysia (193) |
| 11 | Akturan and Tezcan (2012) | TAM+ | PU → ATT (0.363); ATT → INT (0.855); PB → ATT (0.434); RIS (social) → ATT (0.132); RIS (performance) → ATT (−0.131) | Turkey (435) |
| 12 | Laukkanen and Cruz (2012) | SDM | IND → INT (0.083); LTO → INT (0.083); MAS → INT (0.128) | Finland, Portugal (3582) |
| 13 | Ravendran et al. (2012) | SDM | NA | Australia (8) |
| 14 | Safeena et al. (2012) | TAM+ | NA | India (53) |
| 15 | Amin et al. (2012) | TAM+ | CRE → INT (0.282); ENJ → INT (0.240); SE → INT (0.277) | Malaysia (152) |
| 16 | Yu (2012) | UTAUT | PERE → INT (0.318); EE → INT (0.080); SI → INT (0.721); CRE → INT (0.147); COS → INT (−0.352); FC → INT (0.560); SE → INT (0.165) | Taiwan (441) |
| 17 | Saeed (2011) | UTAUT, IDT, UCF | NA | USA (223) |
| 18 | Lin (2011) | IDT | RA → ATT (0.303); PEOU → ATT (0.110); COM → ATT (0.208); PCOMP → ATT (0.329); INTEG → ATT (0.102); ATT → INT (0.196) | Taiwan (368) |
| 19 | Sheng et al. (2011) | TAM, DOI | PU → INT (0.464); PEOU → INT (0.378); COM → INT (0.138); RIS → INT (−0.177) | China (278) |
| 20 | Zhou (2011) | SDM | PU → INT (0.37); TRU → INT (0.42) | China (210) |
| 21 | Bankole et al. (2011) | UTAUT+ | UE → INT (0.319); EE → INT (0.1041); PD → INT (0.138); INT → USE (0.307) | Nigeria (231) |
| 22 | Mohd Daud et al. (2011) | TAM+ | PU → INT (0.426); CRE → INT (0.161); CA → INT (0.330) | Malaysia (300) |
| 23 | Khraim et al. (2011) | DOI | NA | Jordan (301) |
| 24 | Saleem and Rashid (2011) | SDM | NA | Pakistan (300) |
| 25 | Alafeef et al. (2011) | SDM | NA | Jordan (80) |
| 26 | Hsu et al. (2011) | TAM+ | PU → ATT (0.38); PEOU → ATT (0.17); SEC → ATT (0.24); PU → INT (0.15); SI → INT (0.26); ATT → INT (0.72) | Taiwan (275) |
| 27 | Raleting and Nel (2011) | TAM+ | PU → ATT (0.570); PEOU → ATT (0.197) | South Africa (SA) (465) |
| 28 | Bankole and Cloete (2011) | UTAUT+ | NA | SA, Nigeria (451) |
| 29 | Sharma (2011) | SDM | NA | India (100) |
| 30 | Thulani et al. (2011) | SDM | NA | Zimbabwe (15) |
| 31 | Schierz et al. (2010) | TAM+ | COM → ATT (0.61); IM → ATT (0.07); SEC → ATT (0.08); PU → ATT (0.10); SI → ATT (0.17); COM → INT (0.66); IM → INT (0.07); ATT → INT (0.24) | Germany (1447) |
| 32 | Shih et al. (2010) | ELM | PINV → INT (coefficients ranging from 0.72 to 0.79) (five different models) | Taiwan (330) |
| 33 | Tan et al. (2010) | UTAUT | PU → INT (0.439); PEOU → INT (0.291); CONV → INT (0.051); SEC → INT (0.497) | Malaysia (184) |
| 34 | Wessels and Drennan (2010) | TAM+ | PU → INT (0.318); RIS → INT (−0.056); COS → INT (−0.124); COM → INT (0.295) ATT → INT (0.269) | Australia (314) |
| 35 | Koenig–Lewis et al. (2010) | TAM, IDT | PU → INT (0.394); COM → INT (0.385); RIS → INT (−0.185) | Germany (263) |
| 36 | Luo et al. (2010) | UTAUT | PERE → INT (0.499); TRU → INT (0.131); RIS → INT (−0.231); TRU → INT (0.177); SE → INT (0.167) | USA (122) |
| 37 | Shen et al. (2010) | BCF | CONV → INT (0.86); SEC → INT (0.20) | Taiwan (400) |
| 38 | Zhou et al. (2010) | UTAUT, TTF | PE → USE (0.37); SI → USE (0.22); FC → USE (0.24); TTF → USE (0.30) | China (250) |
| 39 | Riquelme and Rios (2010) | TAM2, DOI | PU → INT (0.46); RIS → INT (−0.39); SI → INT (0.31) | Singapore (600) |
| 40 | Püschel et al. (2010) | SDM | Mobile banking users: PEOU → ATT (0.505); RA → ATT (0.458); VIS → ATT (0.454); COM → ATT (0.326); RD → ATT (0.147); TRI → ATT (−0.208); IMA → ATT (−0.267); PBC → INT (0.229); SI → INT (0.178); ATT → INT (0.156) | Brazil (666) |
| 41 | Rao Hill and Troshani (2010) | SDM | ENJ → INT (0.493); PU → INT (0.373); SEC → INT (0.049) | Australia (593) |
| 42 | Amin and Ramayah (2010) | SDM | ATT → INT (0.249); SI → INT (0.286); SEC → INT (0.392) | Malaysia (115) |
| 43 | Yang (2009) | RMM | NA | Taiwan (178) |
| 44 | Gu et al. (2009) | TAM+ | PU → INT (0.380); PEOU → INT (0.213); TRU → INT (0.352) | Korea (910) |
| 45 | Chung and Kwon (2009) | ISSM | NA | Korea (397) |

**Table 4** (*continued*)

| No. | Author(s) | Theories | Significant direct relationships with ATT, INT and USE [a] | Countries and sampling[b] |
|---|---|---|---|---|
| 46 | Crabbe et al. (2009) | TAM+ | PU → ATT (0.298); PU (sustained usefulness) → ATT (0.222); CRE → ATT (0.157); PELIT → ATT (−0.129); PU → INT (0.200); ATT → INT (0.314); PU (sustained) → USE (0.559); PU (sustained) → USE (sustained) (0.484); USE → USE (sustained) (0.400) PU → USE (sustained) (0.185) | Ghana (271) |
| 47 | Kim et al. (2009) | IDT | TRU → INT (0.33); PB → INT (0.18) | Korea (192) |
| 48 | Liu et al. (2009) | TAM+ | PU → INT (0.85); TRU → INT (0.12) | China (438) |
| 49 | Medhi et al. (2009) | SDM | NA | India, Kenya,Philipp,SA (90) |
| 50 | Lee and Chung (2009) | ISSM | NA | Korea (276) |
| 51 | Barati and Muhammadi (2009) | TAM+ | NA | Conceptual |
| 52 | Amin et al. (2007) | TAM+ | PU → INT (0.140); PEOU → INT (0.302); CRE → INT (0.205); SE → INT (0.294) | Malaysia (239) |
| 53 | Sulaiman et al. (2007) | DOI | NA | Malaysia (279) |
| 54 | Amin et al. (2006) | SDM | NA | Malaysia (615) |
| 55 | Luarn and Lin (2005) | TAM | PU → INT (0.31); PEOU → INT (0.33); CRE → INT (0.36); SE → INT (0.18); COS → INT (−0.19) | Taiwan (180) |

*Notes*: TAM = technology acceptance model; TAM+ = extended TAM; IDT = innovation diffusion theory/DOI = diffusion of innovation theory; ELM = elaboration likelihood model; SST A/IUM = self-service technology attitude/intention to use model; TTF = task technology fit; TPB = theory of planned behavior; UTAUT = unified theory of acceptance and use of technology; ISSM = information system success model; UCF = ubiquitous computing framework; BCF = benefit cost framework; and RMM = Rasch measurement model. SDM = self-developed model. NA = Not Applicable. INT = Intention to Use. ATT = Attitude.

[a] The definitions of the constructs appear in Appendix.

[b] Statistical measures for valid responses, mean $N = 365$.

**Table 5**
Meta-analysis of average (means) path coefficients between antecedents of m-banking and attitude and intention.[a]

| | Attitude | Intention |
|---|---|---|
| Compatibility | 0.231 | 0.446 |
| Perceived usefulness | 0.342 | 0.380 |
| Attitude | – | 0.372 |
| Trust | n/a[a] | 0.338 |
| Perceived ease of use | 0.246 | 0.278 |
| Credibility | n/a[a] | 0.254 |
| Social influence | n/a[a] | 0.244 |
| Perceived behavioral control/self-efficacy | n/a[a] | 0.229 |
| Perceived cost | n/a[a] | 0.182 |
| Relative advantage | 0.381 | n/a[a] |
| Risk | n/a[a] | −0.148 |

[a] Average (mean) path coefficients were not calculated for the relationships if fewer than two studies used them.

the development of dedicated marketing programs to create positive attitudes toward m-banking and to attract consumers (Wessels and Drennan, 2010). Marketers could emphasize m-banking's usefulness and compatibility with the consumers' lifestyles, though the design of the m-banking systems must also minimize the risk and cost that consumer face. Another recommendation places more emphasis on gaining consumers' trust by providing reliable, appropriate information (Lee and Chung, 2009). In addition, a few studies offer guidelines with regard to prioritizing different antecedents and developing appropriate strategies to encourage adoption (e.g., Tan et al., 2010). Consumer segmentation (Koenig-Lewis et al., 2010), targeting marketing communication by gender (Riquelme and Rios, 2010), and seamlessly integrating mobile technology services and applications into ordinary banking activities (Yang, 2009) emerged among multiple marketing and business strategies that might encourage potential adopters and presumably increase m-banking adoption rates.

Multiple studies also attempt to identify antecedents of adoption. A particularly prominent antecedent is consumer trust in mobile banking, its associated applications, and the bank, according to several authors (e.g., Jain, 2013; Lee and Chung, 2009; Lin, 2011; Zhou, 2011). Some synergy between satisfaction and trust also emerged from a few studies that report that trust significantly affects the degree of satisfaction and is thus an important variable for m-banking environments (Lee and Chung, 2009). Furthermore, studies conducted in developing (but not developed) countries identify social and culture factors as strong influences on m-banking adoption (Alafeef et al., 2011; Bankole et al., 2011). Similarly, combining these factors with a range of demographic factors indicates that the impact of social and cultural features is significant (Crabbe et al., 2009).

Several independent and dependent variables appear in investigations of varying aspects of consumer decision-making processes related to m-banking adoption. In particular, three main dependent variables (attitude, intention, and usage) and eight independent variables [perceived ease of use, perceived usefulness, trust, social influence, perceived risk, perceived behavioral control (or self-efficacy), compatibility with lifestyle and device, and facilitating conditions] emerged from this review. These contributions constitute the main research stream, as depicted in Table 5 and Appendix.

Of these three dependent variables, a majority of the studies focus on the antecedents of behavioral intention (e.g., Luo et al., 2010; Teo et al., 2012; Zhou, 2011). Fewer studies investigate the antecedents of attitude (e.g., Akturan and Tezcan, 2012; Lin, 2011; Püschel et al., 2010). Only Crabbe et al. (2009) use all three dependent variables (attitude, intention, and use) to assess the impact of social and cultural factors on the adoption of m-banking in Ghana. They find that several independent variables, such as technology usage and services, exert positive influences on adopters but negative influences for non-adopters. In addition, perceived credibility and facilitating conditions affect attitudes toward m-banking adoption. In combination with a range of demographic factors, the impact of social and cultural features emerges as significant.

### 4.1. Main theories

The adoption of technology can be described in various ways. Some studies take a process approach and examine in-depth processes (e.g., Majchrzak et al., 2000); others focus on the relationships between technology adoption and influential variables, as exemplified by the UTAUT and the TAM (Im et al., 2011). The TAM is very popular as a framework for examining intentions to adopt m-banking. Of the 55 studies, 23 (42%) used the TAM as their theoretical framework. This theory asserts that perceived usefulness and ease of use are fundamental determinants of system adoption and usage (Bankole et al., 2011); however, because the TAM excludes economic and demographic factors and external variables, it seemingly has limited use for explaining users' attitudes and behavioral intentions toward mobile service adoptions (Venkatesh and Davis, 2000). Therefore, among the 23 studies that have used TAM as their theoretical framework, many m-banking adoption studies extend or supplement the original TAM by including additional constructs, such as relative advantage and personal innovativeness (Chitungo and Munongo, 2013), perceived risk, perceived cost of use, compatibility with lifestyle and needs (Hanafizadeh et al., 2014), and perceived security (Hsu et al., 2011). Furthermore, the TAM omits any trust-based constructs related to e- or m-commerce and assumes that there are no barriers preventing a user from adopting an information system if he or she chooses to do so (Luarn and Lin, 2005).

Innovation diffusion theory, as developed by Rogers (1995), is the second most widely used model: nine studies (16%) use IDT as their theoretical framework. According to this theory, the adoption rate of a new technology depends on five innovation characteristics: relative advantage, compatibility, complexity, observability, and trialability. Although IDT acknowledges a behavioral process, movement from awareness to acceptance, it does not explain how attitudes form and ultimately lead to acceptance or rejection, nor how innovation attributes fit the process (Bhattacherjee, 2000).

The third most common theory is UTAUT, as developed by Venkatesh et al. (2003). Of 55 studies, seven (13%) use it. This theory focuses on the motivations for user behavior, such as perceived usefulness or relative advantage (Zhou, 2012b). As an extension of the TAM model, it is based on four factors: performance expectancy, effort expectancy, social influence, and facilitating conditions. The greatest limitation of UTAUT is that it does not include cultural factors (Im et al., 2011).

### 4.2. Main antecedents of attitude (ATT), intention (INT), and usage (USE)

This review reveals the intriguing development and consolidation of antecedents used in prior research to study and analyze consumers' behavioral intentions toward m-banking. As many as 84 antecedents have been identified, as listed in Appendix. Studies feature both descriptive and exploratory investigations and measures of the impact of the various constructs using different adoption theories and models. Among the identified antecedents, perceived ease of use (PEOU) and perceived usefulness (PU) are the most commonly used; approximately one-third of all m-banking adoption studies cite them. Other commonly used antecedents include trust, social influence, perceived risk, self-efficacy, compatibility, facilitating conditions, cost, credibility, culture, demographic factors, and structural assurance. Notably, more than 90% of the studies examine intention as their dependent variable, but intention has been used only two times to predict m-banking usage (Bankole et al., 2011; Crabbe et al., 2009). Finally, around half of the antecedents (55%), as listed in Appendix, have been tested only once.

To assess the significance of these antecedents for explaining attitude toward, intention to use, and usage of m-banking, we conducted a meta-analysis (see Table 5) of the ten most commonly used antecedents and calculated mean scores for the path coefficients for each relationship. Only constructs used in at least two different studies were included in this analysis. In total, eight studies use attitude as a dependent variable, 28 papers use intention, and as mentioned, only two articles use usage as their dependent variable.

As Table 5 shows, compatibility, PU, and PEOU have served as antecedents for both attitude and intention. The effect of compatibility on intention is the strongest, followed by the effect of PU and attitude. The effect of PU on attitude and intention generally is stronger than that of PEOU. Credibility, social influence, perceived behavioral control/self-efficacy, and perceived cost have on average a low to medium effect on intention to use m-banking services.

### 4.3. Demographics

A common interest in the studies included in this review is the analysis of user demographics (e.g., Laukkanen et al., 2007; Lee et al., 2005), including age, gender, and education, to predict m-banking adoption. The impact of demographics on the adoption of various electronic devices also has been extensively studied (Laukkanen and Cruz, 2012). According to Crabbe et al. (2009), demographic factors play a significant role in adoption decisions. They find that social and cultural factors, such

as perceived credibility, facilitating conditions, perceived elitism, and demographic factors, significantly affect adoption decisions for m-banking in Ghana. Similarly, a survey conducted in Malaysia (Sulaiman et al., 2007) reveals that both demographic and psychographic variables affect the adoption of new innovations such as m-banking—in particular, age, gender, personal income, and education. Finally, in their investigation of the influence of demographic factors on the adoption of m-banking and its applications, Teo et al. (2012) also incorporate demographic factors and subjective norms with the TAM to assess intentions to adopt in Malaysia. They extend the TAM with four demographic factors (gender, age, education, and income) and subjective norms and thus reveal that education and income had positive relationships with PU, whereas gender and education related positively to PEOU.

## 5. Conclusions

This study provides a systematic review of literature on m-banking adoption published from January 2005 to March 2014 (Inclusive). The 55 relevant studies appear in 48 journal articles and seven conference proceedings and represent a reasonably deep view of the field of m-banking acceptance research. Since 2009, both empirical and conceptual research activities have increased and appear likely to grow increasingly pervasive. However, this literature review also shows that existing research is fragmented, constituted by various theoretical frameworks, with relatively small sample sizes (average $N = 365$) drawn from both developed and developing countries. Furthermore, it mostly depends on the TAM and its modifications to explain intentions to use m-banking. An analysis of the conceptual models expressly acknowledged in these studies reveals a large and heterogeneous sample, consisting of 11 models, theories, or frameworks used to study different constructs, attributes, and factors that lead to m-banking adoption. In addition, many of the studies in our sample provide customized research models that feature both internal and external factors.

Accenture (2013) reports that, in developing countries one form of m-banking, i.e., m-payments, is gaining a strong foothold. However, as an emerging service, the use of mobile phones to conduct banking transactions and access other financial information (especially in mature markets) has not been widely adopted (Juniper Research, 2013). In acknowledging this problem, studies have examined consumer behavioral intentions toward the adoption of m-banking using various antecedents. Impediments to acceptance or adoption have been investigated mainly using quantitative methods in studies that refer to a wide variety of influences on the acceptance of m-banking and other products offered by various banks, microfinance institutions, and mobile operators.

However, several dependent and independent variables can be identified as prominent in investigations of the consumer decision-making process for m-banking. For example, most research includes two main dependent variables (attitude and intention) and eight independent variables (perceived ease of use, perceived usefulness, trust, social influence, perceived risk, perceived behavioral control (or self-efficacy), compatibility with lifestyle and device, and facilitating conditions) that seemingly define the main research stream. Furthermore, the results reveal that compatibility, PU, and attitude are the most significant drivers of intentions toward using m-banking.

Finally, extant research has focused almost entirely on SMS banking, without addressing more developed m-banking, such as applications. This choice has limited the contributions to current knowledge. To suggest further research directions, this review also consolidates the antecedents already used to study consumer behavioral intentions.

### 5.1. Limitations

Some limitations of this review offer opportunities for additional research. First, the review centers on research pertaining to consumer acceptance or adoption of m-banking, but m-banking is vast in scope, comprising aspects such as infrastructure, technology, and innovation. It also offers both growth potential and potential pitfalls. Incorporating all these aspects of m-banking into future literature reviews would be useful for delineating the evolving banking channel. Second, the acceptance or adoption of m-banking is the core of this study, so it excluded factors that prompt post-adoption usage or consumers' continuous intentions to use m-banking. Third, although m-banking and m-payments are two important components of mobile financial applications (Mallat et al., 2004), the literature search was conducted with the key term 'm-banking', so excluding the scant specific literature on m-payments from the primary scope. However, as most of the studies reviewed did not distinguish between m-banking and m-payments, our literature review is limited in that it was impossible to scrutinize specific categories of m-banking, such as m-payments. Similarly, studies specifically discussing factors that might prevent the adoption of m-banking were also considered beyond the scope of this study. Fourth, the literature search focused on m-banking acceptance or adoption, which might have led to the exclusion of some important and relevant articles. Fifth, despite clear reasons to commence the review in January 2005, m-banking (such as SMS banking) also existed before that point.

### 5.2. Further research

The following recommendations for research derive partly from the directions, recommendations, and suggestions mentioned in the reviewed studies, as well as from the analysis of the results of the present study. For example, most studies of consumer behavior in m-banking are cross-sectional in nature or limited to a single demographic location such that they

measure the perceptions and intentions of consumers at a single point in time. As a result, it is not possible to elicit extensive generalizations from their conclusions. In addition, most studies have limited their data collection to a single country, using banking as a test bed. To overcome such common limitations, several areas offer the potential to deliver additional and relevant insights.

*5.2.1. Research design*

In emphasizing the need for qualitative research, more studies should use unstructured interviews to analyze consumer behavioral intentions toward m-banking adoption. To improve the quality and relevance of their studies, researchers might collect more empirical data, supported by different guiding theories, to clarify adoption patterns across a range of consumers. Combinations of qualitative and quantitative approaches also might effectively test these conceptual models and investigate semantic relationships among the factors or constructs applied. This recommendation is based on the recognition that prior research mostly has used survey instruments to collect data and test hypotheses.

*5.2.2. Transnational and cross-cultural studies*

M-banking is a worldwide phenomenon; studies that undertake a comparative analysis of developed and developing economies using different models and approaches could produce meaningful insights into the behavior and attitudes of participants. As suggested by Crabbe et al. (2009), cross-cultural and transnational studies would enable researchers to determine how specific social and cultural characteristics of a society influence the adoption of technologies and services among its members. A quick overview of the 55 studies included in this review suggests that only three (Laukkanen and Cruz, 2012; Bankole and Cloete, 2011; Medhi et al., 2009) are transnational. A comparative analysis of m-banking adoption by stakeholders living in rural and urban areas is also necessary; no prior study has addressed this critical aspect. Many researchers have highlighted the need for broad-based, large-scale, longitudinal studies of m-banking adoption, and it follows that eliminating short-term effects by considering a more representative sample over time would extend understanding.

*5.2.3. Ethnographic studies*

Following initiatives in developed countries, most developing countries recently have started creating unique, customized, dedicated m-banking solutions for their consumers. For example, the Philippines (G-Cash) and Pakistan (easypaisa) have introduced innovative services to meet the banking needs of consumers who live in remote, rural areas and have little or no access to the formal banking system. Ethnographic research in these countries would likely provide valuable insights into adoption by local consumers.

*5.2.4. Microfinance institutions*

If it is defined to include microfinance institutions, the m-banking sphere has opened new investment and innovation opportunities and expanded the scope of banking to serve low-income markets. However, most studies focus on banking contexts, leaving substantial scope for exploring the integration of microfinance with m-banking. Creating an m-banking culture, particularly in developing economies, may produce differentiated findings and potentially help microfinance institutions to develop future marketing plans with a better understanding of their consumers' preferences and choices.

*5.2.5. M-banking adoption from service providers' and network carriers' perspectives*

Explorations of m-banking adoption from the perspective of service providers, such as software houses, MNOs, IT solution providers, or network carriers, would be welcome. As indicated by Accenture (2013), "m-payments bridge the telco industry to other industries from banking and financial services to consumer goods and the public sector." Industry convergence offers new opportunities for the different players in the m-banking ecosystem, an aspect not yet examined in m-banking literature.

*5.2.6. Development of legal and regulatory frameworks*

Considering the enormous benefits associated with m-banking, such as providing financial services to unbanked communities, reducing banks' operating costs, providing new growth opportunities, and enabling new innovations in financial services, many countries have formalized m-banking by introducing regulatory frameworks. Further studies of these frameworks could prove valuable. Moreover, most consumers probably are not aware of the presence of such legal or regulatory frameworks governing the products or services they use. Investigating consumer awareness and understanding in this area would be worthwhile.

*5.2.7. Research on smartphone and tablet PC users*

Surprisingly, no study has explicitly investigated the behavior of smartphone or tablet users in relation to m-banking. Because users of smartphones and tablets adopt applications provided by their banks to access m-banking, they might differ considerably in their attitudes and intentions toward m-banking. Therefore, it would be interesting to investigate issues such as continued intentions to use among this particular subset of consumers.

*5.2.8. Relationship between m-banking, m-payments and electronic payments*

Another critical theme for future research is to understand the relationship between m-banking, m-payments, and electronic payments. As argued by Dahlberg et al. (2008), the relationships between these technologies and services are unclear and there is still some confusion about whether these are just a new access channel serving existing services, or a new payment instrument, or both. Studies examining this question would add value to the existing literature.

## Appendix A

Antecedents of m-banking adoption.

| No. | ID | Description | Frequency | Theory |
|---|---|---|---|---|
| 1 | PEOU | Perceived ease of use | 27 | TAM, IDT, SDM |
| 2 | PU | Perceived usefulness | 23 | TAM, SST A/I UM |
| 3 | TRU | Trust | 16 | BCF, IDT, ISSM, SDM, TAM, UTAUT |
| 4 | SI | Social influence/subjective norm | 15 | TAM, SDM, TPB, UTAUT |
| 5 | RIS | Perceived risk | 14 | TAM, IDT, SDM, SST A/I UM, UTAUT |
| 6 | SE | Self-efficacy | 11 | BCF, ELM, IDT, SDM, TAM, UTAUT |
| 7 | COM | Compatibility (lifestyle, device) | 10 | IDT, SDM, TAM, UCF |
| 8 | FC | Facilitation conditions | 9 | SDM, TAM, TTF, UCF, UTAUT |
| 9 | COS | Cost | 8 | RMM, TAM, UTAUT, |
| 10 | CRE | Credibility | 8 | IDT, TAM, UTAUT |
| 11 | CUL | Culture | 8 | SDM, UTAUT |
| 12 | DEM | Demographic factors | 8 | IDT, SDM, TAM, UTAUT |
| 13 | SA | Structural assurance | 8 | ELM, SDM, TAM, UTAUT |
| 14 | RA | Relative advantage | 6 | IDT, SDM, TAM |
| 15 | ATT | Attitude toward use/m-banking | 5 | SDM, TAM, TPB |
| 16 | SYSQ | System quality | 5 | ELM, ISSM, TAM, SDM |
| 17 | TRI | Trialability | 5 | IDT, SDM, TAM, UTAUT |
| 18 | EE | Effort expectancy | 4 | UTAUT |
| 19 | IQ | Information quality | 4 | ELM, ISSM, SDM |
| 20 | SEC | Security | 4 | BCF, SDM, TAM |
| 21 | ACC | Accessibility | 3 | IDT, SDM, UTAUT |
| 22 | CPX | Complexity | 3 | IDT, SDM |
| 23 | CONV | Convenience | 3 | BCF, IDT, UTAUT |
| 24 | NI | Need for interaction | 3 | SST A/I UM, TAM |
| 25 | PB | Perceived benefit | 3 | IDT, SDM, TAM |
| 26 | PBC | Perceived behavioral control | 3 | BCF, SDM, TPB |
| 27 | PERI | Personal innovativeness | 3 | IDT, SDM |
| 28 | PERE | Performance expectancy | 3 | UTAUT |
| 29 | SAT | Satisfaction | 3 | ISSM, UTAUT |
| 30 | SPE | Speed | 3 | SDM, RMM, TAM |
| 31 | UA | Uncertainty avoidance | 3 | SDM, UTAUT |
| 32 | CA | Consumer awareness | 2 | TAM |
| 33 | IMA | Image | 2 | SDM |
| 34 | PRI | Privacy | 2 | IDT, SDM |
| 35 | PEIN | Perceived innovativeness | 2 | SDM, TAM |
| 36 | ENJ | Perceived enjoyment | 2 | SDM, TAM |
| 37 | SQ | Service quality | 2 | ELM, ISSM |
| 38 | UBI | Ubiquity | 2 | SDM |
| 39 | AFF | Affordability | 1 | SDM |
| 40 | ALE | Alertness | 1 | UTAUT |
| 41 | BAN | Banking needs | 1 | IDT |
| 42 | BEI | Behavioral introspection | 1 | BCF |
| 43 | BEN | Benevolence | 1 | IDT |
| 44 | COIN | Conventional interface | 1 | SDM |
| 45 | DEV | Device type/features | 1 | SDM |
| 46 | ECOF | Economic factor | 1 | SDM |
| 47 | EXPEC | Expectations | 1 | SDM |

(*continued on next page*)

**Appendix A** (*continued*)

| No. | ID | Description | Frequency | Theory |
|---|---|---|---|---|
| 48 | EXP | Experience | 1 | SDM |
| 49 | EXPER | Expertise | 1 | BCF |
| 50 | EXTI | External influence | 1 | SDM |
| 51 | FREP | Firm reputation | 1 | IDT |
| 52 | FLOW | Flow (experience) | 1 | SDM |
| 53 | FU | Frequency of usage | 1 | SDM |
| 54 | FF | Functional factor | 1 | SDM |
| 55 | IP | Information presentation | 1 | ISSM |
| 56 | INTEG | Integrity | 1 | IDT |
| 57 | MPE | Mobile phone efficacy | 1 | UTAUT |
| 58 | OF | Organizational factor | 1 | SDM |
| 59 | PCOMP | Perceived competence | 1 | IDT |
| 60 | PELIT | Perceived elitism | 1 | TAM |
| 61 | PLBC | Perception of latest banking channels | 1 | SDM |
| 62 | PINV | Personal involvement | 1 | ELM |
| 63 | PERS | Personalization | 1 | UTAUT |
| 64 | REPU | Reputation | 1 | SDM |
| 65 | RD | Results demonstrability | 1 | SDM |
| 66 | SITNO | Situational normality | 1 | TAM |
| 67 | SC | Service compatibility | 1 | UTAUT |
| 68 | SADO | Services adopted | 1 | SDM |
| 69 | SF | Strategic factor | 1 | SDM |
| 70 | TBI | Tag-based interface | 1 | SDM |
| 71 | TCHA | Task characteristics | 1 | UTAUT |
| 72 | TF | Technological factor | 1 | SDM |
| 73 | TA | Technology anxiety | 1 | BCF |
| 74 | TECHA | Technology characteristics | 1 | UTAUT |
| 75 | TR | Technology readiness | 1 | ELM |
| 76 | IM | Individual mobility | 1 | TAM |
| 77 | UE | Utility expectancy | 1 | UTAUT |
| 78 | VIS | Visibility | 1 | SDM |
| 79 | IR | Innovation resistance | 1 | TAM |
| 80 | PD | Power distance | 1 | UTAUT |
| 81 | TTF | Task technology fit | 1 | TTF |
| 82 | IND | Individualism | 1 | SDM |
| 83 | LTO | Long-term orientation | 1 | SDM |
| 84 | MAS | Masculinity | 1 | SDM |

*Notes*: Frequency refers to the number of times a specific antecedent was used; the constructs are listed in descending order of their frequency.

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# III

## MOBILE BANKING SERVICES CONTINUOUS USAGE – CASE STUDY OF FINLAND

by

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# Mobile banking services continuous usage – Case study of Finland

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## Abstract

*Finland is at the forefront of using new information systems, such as mobile banking (m-banking). The present study develops and tests a model of continuous usage intentions toward m-banking services for a sample of 273 Finnish m-banking users. Results confirm the hypothesized direct relationships between self-congruence and perceived value, perceived risk and perceived value, perceived value and continuous usage, and continuous usage and word of mouth. The frequency of usage of m-banking services and experience moderate the relationship between perceived value and continuous usage. We discuss the theoretical and managerial implications of the study results and present recommendations for future research.*

## 1. Introduction

Due to increased competition and technological innovation in the retail financial service sector, banks have begun to employ financial information systems and alternative delivery channels (ADCs) to achieve a sustainable competitive advantage [47], invigorate customer relationship management [73], and enable consumers to make real-time financial decisions conveniently and independently of time and location [20].

The literature [60] regards m-banking as an innovative information system (IS) and communication delivery channel that delivers both financial (e.g., fund transfers) and non-financial (e.g., account balance requests) services to consumers through cell phones and tablets. A critical review of earlier literature on IS and consumer behavior investigating the consequences and the antecedents of IS such as m-banking has identified four distinct research streams: consumer pre-adoption resistance to IS [41]; consumer pre-adoption or acceptance of IS [19]; consumer post-adoption or continuous usage of IS [8]; and consumer pre- and postadoption of IS [36].

For the most part, the literature has investigated the pre-adoption antecedents or acceptance of m-banking [50];[60], and there is little empirical evidence regarding the consequences of m-banking or continuous usage. In addition, research on how individuals with different levels of experience in using IS such as m-banking react to different service-related characteristics is in a nascent stage [50]. Thus, the collective understanding of continuous usage behavior is at an early stage of development [25]. Research on postadoption consequences and continuous usage is particularly relevant for the banking industry because the cost of acquiring a new customer is five times greater than the cost of retaining an existing customer [79].

The present paper examines the post-adoption consequences that influence users of m-banking services in Finland to determine how to effectively increase continuous usage. To guide this effort, we develop and empirically test a literature-based theoretical model based on self-congruence (SC), perceived risk (PR), perceived value (PEVA), continuous usage (USE), and word-of-mouth (WOM). In the model, we control for the effects of gender, age, income, and usage share and assess the indirect effects of frequency and experience on USE.

Finland is at the forefront of adopting and using new banking technologies, services and products, such as Internet and m-banking. In 2014, the share of Internet banking users mirrored that of Internet users in general, with 86 percent of residents in Finland using the Internet for online banking and 85 percent using online services overall [65]. With respect to mobile devices, approximately 60 percent of users own a smartphone with access to the Internet, and 32 percent (approximately one-third) of Finnish households use at least one tablet [65]. However, a computer remains the most preferred device to pay bills, as 7 percent (less than one-tenth) of the adult population use smart phones or tablets to pay bills [17].

With respect to the vast online presence and an extensive usage of mobile phones, Internet banking services were first introduced in Finland in the mid-

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1990s [30], and m-banking services were introduced in 1996 [28]. Since then, banking institutions have collaborated with non-banking institutions commonly known as "service providers" or "third parties" to provide banking services over mobile networks in Finland [27].

The remaining sections of the paper are organized as follows: Section 2 discussed research model, latent variable and associated hypothesis; Section 3 presents the research methodology; Section 4 presents the study results; Conclusions, limitations and future research directions are presented in the last section.

## 2. Research model and hypotheses

The research model is illustrated in Figure 1. The model proposes that SC and PR have a direct effect on PEVA, which is hypothesized to positively affect USE. In the model, PEVA mediates the effects of SC and PR on USE. The model also proposes that USE eventually produces positive WOM. In addition, we test the moderating effects of frequency and experience on the relationship between PEVA and USE. Finally, the model controls for gender, age, income and share of usage (see Figure 1).

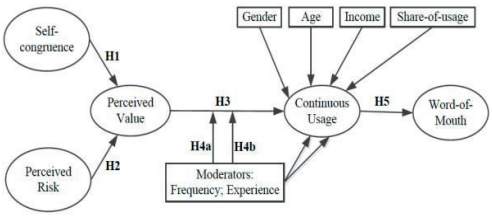


Figure 1: Research Model

### 2.1. Continuous or post-adoption usage of IS

Rapid innovations and advances in mobile IS and mobile technology in general have increased the importance of m-banking [46], and understanding consumers' behavioral intentions to continuously use m-banking services has been identified as a key research focus [60]. Prior research [36];[29] has identified m-banking as an important IS, examined how and why individuals use new IS in their decision making tasks, and demonstrated the significance of customer retention for banks and service providers. In the same vein, [3] claimed that IS continuance at the level of the individual user is central to the survival of many e-commerce firms, online retailers, and online financial service providers.

### 2.2. Self-congruence and perceived value

The terms SC, self-image congruence, self-congruity, and image congruence are used interchangeably in the consumer behavior literature [38]. However, previous empirical studies have failed to examine SC in the context of the USE of m-banking services. The failure to investigate the effects of SC in the service usage literature might represent a critical shortcoming [13].

SC theory is typically applied to explain the effect of self-image congruence on consumer behavior [63], and [13] noted that the theory proposes that consumer behavior is partially determined by the congruence resulting from a psychological comparison between the image of the typical product user and the individual consumer's self-concept. The extant marketing and IS research has primarily focused on the relationship between self-image congruence and consumers' pre-purchase evaluations [13];[21]. Relatively few studies have employed the concept of self-image to model post-consumption evaluations [64] and little is known regarding the extent to which SC or self-image congruence influences PEVA for m-banking services post-adoption or for the USE of m-banking services. Because SC has been found to influence user product or service preferences and usage intentions, we proposed the following hypothesis:

**H1:** Self-congruence (SC) exerts a positive effect on perceived value (PEVA) with respect to continuous usage intentions for m-banking services.

### 2.3. Perceived risk and perceived value

Research has investigated the effects of PR on various aspects of consumer behavior [23] related to technology adoption and USE in a number of settings, such as Internet banking services [78]; online banking services [1]; e-services [16]; m-banking services [47] and electronic commerce services [33].

Purchasing online or virtual banking services has generally been perceived to be riskier than purchasing traditional banking services. Consequently, PR is an important factor influencing end-user intentions to engage in Internet banking [48]. Earlier studies have vigorously debated the influence of PR on consumer purchase and usage intentions [1] and examined its relationship to different antecedents, few have investigated the relationship between PR and PEVA with respect to IS usage [7]. Based on the above considerations, we propose the following hypothesis:

**H2:** The perceived risk (PR) of m-banking services usage negatively affects its perceived value (PEVA).

### 2.4. Perceived value and continuous usage intentions

M-banking has emerged as a wireless service delivery channel that creates added value for customer financial transactions [39];[40]. M-banking services offer certain unique value features that distinguishes m-banking from conventional forms of banking, such as ubiquity and immediacy [80] featuring real-time information flow for banking and m-commerce transactions at any time and any place; instant connectivity and reachability [43] with respect to banking information; and localization or location-specific [36] features that enable the user to locate an ATM or bank branch. PEVA has been defined as consumer's overall assessment of the utility of a product (or service) based on perceptions of what is received and what is given [66]. Previous studies on the continuous usage of IS have identified that PEVA significantly influences continuation intentions [9] and adoption decisions of consumers are largely based on PEVA [34]. Because PEVA influences consumer intentions and decision to use IS including m-banking banking services, we propose the following hypothesis:

**H3:** Perceived value (PEVA) exerts a significant positive effect on continuous usage intentions toward m-banking services.

### 2.5. Moderating effects of frequency and experience

Researchers have proposed that frequency of use and similar constructs, such as user online activity, positively influence brand value and attitudes [70] and loyalty toward the associated brand [59]. For online systems, more frequent use of a service has been found to be positively related to continuous use of the service [62]. However, other studies [59] have found the effects of user activity to be mixed.

Experience has been found to be a strong predictor of attitudes toward technology [55], intentions to use mobile services [37] and so forth. The UTAUT2 model proposes that greater experience leads to greater familiarity with the IS and that better knowledge structures facilitate the use of an IS and thus reduce user dependence on external support [72]. The UTAUT2 model also proposes that experience has a moderating effect on the relationships between three antecedents of intention (facilitating conditions, hedonic motivation, and habit) and intention as well as on the relationship between intention and use. However, the UTAUT2 model does not test the moderating effect of experience on the relationships between performance expectancy and intention, effort expectancy and intention, and price value and intention. Because these three constructs capture similar aspects to our PEVA construct, they provide an opportunity to test these effects. Based on the above considerations, we propose the following two hypotheses:

**H4a:** Increasing the frequency of m-banking usage strengthens the positive influence of perceived value (PEVA) on continuous usage intention.

**H4b:** Greater experience in using m-banking services strengthens the positive influence of value (PEVA) on continuous usage intention.

### 2.6. Continuous usage intention and word of mouth

WOM communications significantly influence consumer decision making [44], and the increase in the use of IS has led businesses and marketing researchers to recognize the importance of electronic WOM (e-WOM) [12]. E-WOM is defined as 'any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet' [76, p.2]. Positive WOM contributes to positive images of a product or service that facilitate consumer decision-making processes and promote the offering. In contrast, negative WOM creates a negative image of a product, service or brand. However, marketers believe that the effects of negative WOM are stronger than the effects of positive WOM [15].

WOM significantly influences the adoption and use of IS [56];[57]. Some researchers have claimed that this relationship is based on positive attitudes and trust [44], and trust and attitudes such as customer satisfaction and loyalty have been found to significantly affect positive WOM for mobile instant text and voice messaging communication services [5]. Based on the above considerations, we propose the following hypothesis:

**H5:** M-banking continuous usage intentions exert a significant positive effect on word of mouth (WOM).

## 3. Research methodology

The data was collected from a sample recruited using purposeful sampling methods. The study

participants were experienced m-banking users who had engaged in m-banking for at least six months. Thus, the study sample was able to contribute to the theoretical understanding of the focus of the study.

### 3.1 Instrument development, validation and data collection

Because the research was conducted with a Finnish-speaking community, the survey items were first translated from English to Finnish by a researcher who was a native Finnish speaker. To ensure consistency, the items were back-translated into English by a different researcher. The survey instrument was tested in a pilot study with a sample of final-year students at a local university who had m-banking experience. Information from the pilot study results was used to modify the wording of a few items to improve clarity.

A professional marketing research firm was hired to collect data from experienced m-banking users, and the data were collected during a four-week period in late 2014. In all, 392 respondents participated in the study and completed the questionnaire. Of these 392 respondents, 273 met the sampling criterion of being experienced m-banking users. To assess response bias, the responses of the first 25 percent of respondents were compared to the responses of the last 25 percent of respondents; there were no significant differences between the responses of the two groups at the $p < 0.05$ level.

### 3.2. Measurement

The items measuring the five latent variables were drawn from previously validated instruments (See Annexure A). Items measuring SC were adopted from [63]. PR was measured using a scale developed by [31]. Items measuring PEVA were taken from [35]. Items for USE were taken from [79]. WOM was measured using items in [5] and [53]. The research model also includes the two moderating variables of frequency of m-banking usage and m-banking experience and the four control variables of gender, age, income, and share of m-banking usage. The moderator and control variables were measured using single-item scales, apart from share of m-banking experience, which was measured using two items. Frequency of use of m-banking services was measured by the item "When was the last time you used m-banking services on your smartphone or tablet?" on a five-point scale that ranged from 1 (1 to 3 days ago) to 5 (over one month ago). M-banking experience was measured by the item "How long have you been using an m-banking application?" on a six-point scale that ranged from 1 (less than three months), 2 (3 to 6 months), 3 (6 to 12 months), 4 (1 to 2 years), 5 (2 to 4 years), to 6 (more than 4 years) [71]. The items measuring the proportional usage of m-banking ("Please estimate how much of your banking (as a percentage) is conducted via an m-banking application" and "When recalling the last ten times you logged into wireless banking services, how many times did this involve an m-banking application?") were based on a ten-point scale and were taken from [14] share-of-wallet scale.

## 4. Results

In the study sample, 53.5 percent of the respondents were female and 46.5 percent were male; 28.9 percent were between the ages of 35 to 49 years, and 25.6 percent were between the ages of 50 to 64 years. Over half of the respondents (62 percent) had an individual monthly gross income of 2001 to 6000 Euros. The sample represents quite well Finnish adult population in terms of gender (51% are female), age (35-49: 19%; 50-64: 21%) and income (average income 2330 EUR) [65].

Approximately half of the survey respondents (47.3 percent) stated that they performed more than 5 out of 10 banking transactions (51 percent) using m-banking applications, while approximately one fifth (18.3 percent) reported that they rarely used m-banking applications for banking transactions. When respondents recalled the last ten times they had accessed wireless banking services, they reported using mobile applications for approximately half the sessions, on average (mean = 5.29 on a ten-point scale).

The data were analyzed using SmartPLS 3.0 [58]. To assess the reliability and validity of the measures, we calculated factor loadings, composite scale reliability (CR) and average variance extracted (AVE). The factor loadings ($\geq 0.807$), composite reliabilities of the scales ($\geq 0.872$) and AVEs ($\geq 0.695$) exceeded the cut-off values.

Reference [18] suggested that the value of the square root of AVE in each latent variable with multiple item constructs can be used to establish discriminant validity when this value is larger than other correlation values among the latent variables. Discriminant validity was exhibited in the present analysis because the square root of the AVE was higher than the correlation between any two latent constructs [18]. Each of the latent variables met these criteria, supporting discriminant validity.

Due to the importance of assessing common method bias, we followed the procedure

recommended by [51] to determine common method bias because prior research [45] has favored the use of this method. The procedure specifies a common method construct (termed the method construct) whose indicators include all the indicators used in the latent variables in the research model. Our analysis found that the average factor loading was 0.78 and that the average variance explained by the common method construct was 0.02, indicating that common method bias did not significantly affect our study results.

The results supported all the direct relationships in the path model (see Figure 1). The analysis confirmed that SC was a significant determinant of PEVA ($\beta = 0.505$; $p < 0.01$) and that PR was also a significant determinant of PEVA, although the effect was not as strong ($\beta = -0.264$; $p < 0.01$). The analysis also confirmed relationships between PEVA and USE intention ($\beta = 0.502$; $p < 0.01$) and between USE intention and WOM ($\beta = 0.751$; $p < 0.01$). Thus, the data supported all the hypotheses regarding direct effects (H1, H2, H3, H5). We calculated the coefficient of the determinants (R2) value for each endogenous latent variable. As Figure 2 indicates, the R2 of the endogenous latent variables confirmed that our research model accounted for 40.6 percent of the variance in PEVA, 64.5 percent of the variance in m-banking USE intention, and 56.4 percent of the variance in WOM.

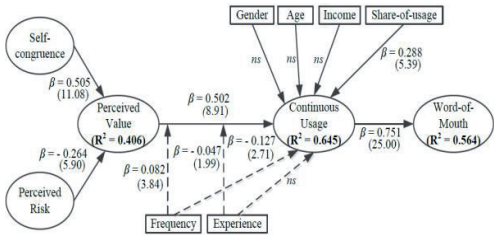


Figure 2: Results of PLS Analysis

With respect to the moderating effects of experience and frequency, we found that frequency of using m-banking services significantly strengthened the relationship between PEVA and USE intention (moderating effect = 0.082; $p < 0.01$). Thus, the more frequently users accessed m-banking applications, the stronger the link was between PEVA and continuance intention. Experience exhibited the opposite effect (moderating effect = -0.047; $p < 0.05$); less experience with m-banking was related to stronger effects of PEVA on continuance intention.

## 5. Discussion and conclusions

Due to the enormous growth in the use of portable devices and anytime, anywhere banking practices, some researchers have predicted that consumers will prefer the convenience and novelty of m-banking [50]. Consequently, financial institutions have included m-banking among their strategic objectives [49]. Because financial institutions must offer online and m-banking services to be competitive [75], it is essential to identify the types of users who are likely to adopt m-banking services and the extent to which their continuous usage of these services might change.

The goal of the present research is to develop and test a conceptual model to improve our understanding of the consequences of USE of m-banking services in a mature market. Our theoretical model appears to be the first to examine the direct and indirect effects of SC, PR, PEVA, frequency and experience on USE intention and the effects of USE intention on WOM. The results of the analysis support five of our six hypotheses, which suggest that the research model accurately describes the nomological network [13] surrounding consumer USE intentions toward m-banking services.

Our analysis contributes to current theory by assessing the effects of SC (i.e., self-image congruence) on m-banking adoption. [13] argued that because innovative products play an important role in developing self-image, the antecedent of self congruence defines and exhibits innovative aspects of the user's personality. The finding that SC is significantly related to PEVA addresses a critical gap in the extant literature, which does not seem to have analyzed the effect of SC on m-banking USE. The few studies investigating the effects of SC have generally focused on consumer post-adoption behavior in the tourism/cruise ship [21] and automobile [24] sectors, finding strong positive relationships between SC and satisfaction [64], innovativeness [13], and brand loyalty [38].

We find a significant but moderate relationship between PR and PEVA (H2), which is consistent with the findings reported by [8] and which partially supports the results reported by [22] and [10]. Following [8], our finding suggests that m-banking users in developed countries are technophiles (i.e., individuals who adopt, use and are enthusiastic about new and advanced technologies) who focus on the obvious benefits of using m-banking services rather than on m-banking security issues. An earlier Finnish study [4] found that potential risks were not taken into account in marketing and developing innovative m-banking services. Previous research has

extensively analyzed PR and its relationship with PEVA. For example, previous research has viewed PR as an antecedent that directly and negatively influences consumer PEVA and purchase intentions [7].

Our results indicate that PEVA was significantly associated with increased m-banking continuous usage (H3) and that PEVA was a significant antecedent of the intention to use for consumers in a mature market. Consequently, our findings confirm that PEVA influences consumer USE intentions toward m-banking. Our finding also suggests that understanding what users' value can promote the establishment of long-term user relationships [11]. The significant relation between these two latent variables is consistent with empirical findings in the literature on USE in other IS, such as social networking sites [2], e-learning systems [6]; [11], and online banking [69].

Our analysis also reveals the critical influence of USE on WOM. This finding was expected because the convenience and the ease of use of m-banking services [60] allows consumers to access banking information more easily, which increases consumer satisfaction and thus contributes to positive WOM and customer retention. This finding is especially relevant for the financial sector because a 5 percent improvement in customer retention can generate an 85 percent increase in service provider profitability [5].

Prior research [61] has examined frequency of use because the frequency of use of e-services such as Internet and m-banking, which is positively related to satisfaction [1]. The results of our analysis contribute to this literature by confirming that user activity is a significant antecedent to continuous use. The frequency with which users accessed their mobile applications was significantly and positively associated with the extent to which PEVA predicted USE. However, although previous research has identified experience as a critical factor influencing individual attitudes and intentions to use a technology [31], our study finds that the moderating effect of frequency of use of m-banking services on the relationship between PEVA and USE was stronger than the moderating effect of experience. The moderating effect of experience on the relationship between PEVA and continuous use was negative, which might be due to the novelty-seeking tendency proposed by the UTAUT2 model [72]. The UTAUT2 model proposes that the importance of certain antecedents of use such as hedonic motivation diminishes with increasing experience. For m-banking, our finding might indicate that newer, less-experienced users of the service focused more on the novelty of the application, which might have motivated them to use it.

In summary, although previous research has identified a number of antecedents and consequences of behavioral intentions to adopt and use m-banking services [46] in developed and developing countries, the present study substantially contributes to the literature on m-banking by providing a more detailed and comprehensive understanding of m-banking USE.

Outcomes of the present study have implications for financial service providers such as banks, financial institutions, microfinance institutions and telecom industry that seek to promote USE of m-banking services continuous usage among new and existing customers. Our findings suggest that m-banking continuous use is significantly influenced by PEVA and that PEVA is a vital prerequisite for successful long-term relationships between users and banks providing m-banking services.

Because banks, financial institutions and telecom companies are eager to capture and "lock in" customers, the ability to offer cutting-edge and innovative banking applications and value-added services in a mature market such as the Finnish market also enables financial service providers to secure customer loyalty and increase customer satisfaction and retention [26].

Our findings support [43] recommendation that financial service providers profile customers based on usage orientation (i.e., individual or organizational), motivation, and behavioral patterns of m-banking service usage (i.e., temporal and spatial usage characteristics). Following this recommendation should enable financial service providers to improve marketing and operational strategies, improve understanding of consumer behavior, and improve the effectiveness of m-banking system management.

Our analysis finds a significant relationship between USE and WOM. To increase satisfaction, develop positive WOM and ensure the sustainable usage of products and services such as m-banking, financial service providers must meet consumers' growing m-banking needs, particularly in the key areas of accessibility, functionality, user application ratings and alerts/notifications.

The present study is not without limitations. Future research should examine the direct effects of different dimensions of perceived value such as monetary value, convenience, social value, emotional value, conditional value and epistemic value [54] on USE intentions toward m-banking services. Moreover, [13] noted that increasing our understanding of the contribution of SC to the USE

of an innovative product or service enables banks and other service providers to design specifically targeted and customized promotion appeals emphasizing the symbolic features that maximize new product diffusion.

Because the present study was conducted in a single country with a relatively small sample, the generalizability of our findings is limited. Consequently, comparative investigations of the USE of m-banking services in a range of developed and developing countries are needed to increase the generalizability of our research findings. In addition, because the study sample was predominantly recruited from "urban" areas [65], our study results might not extend to "rural" areas, where the continuous usage of individuals may differ [75]. However, the model developed in our study of USE might be applied to investigations of USE in other IS, such as Internet banking. Future research on the adoption and USE of m-banking services should also acknowledge the crucial role of SC and examine this factor as well as the relationship between PEVA and USE intention. Because previous studies have not investigated the moderating effect of frequency on USE intentions toward m-banking, future research should investigate this issue.

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## Appendix

**Self Congruence [63]**

- People similar to me use m-banking.
- I can identify with people who prefer m-banking to other forms of banking.
- The image of a typical user of m-banking is highly consistent with how I see myself.

**Perceived risk [31]**

- I would worry about how reliable m-banking application would be.
- I would be afraid m-banking application would not provide me with level of benefits that I expected.
- I would be concerned about security risks in m-banking application.

**Perceived value [35]**

- Using m-banking application is an enjoyable experience.
- The overall value of my experience using m-banking application is outstanding.
- M-banking application represents good use of my time and money.

**Usage [79]**

- I intend to continue using m-banking application rather than discontinue its use.
- My intentions are to continue using m-banking application than use any alternative means.
- If I could, I would like to discontinue my use of m-banking application (reverse coded).

**Word of mouth [5];[53]**

- I will recommend m-banking application to other consumers.
- I will point out the positive aspects of m-banking application if anybody criticizes it.
- I tell positive things about m-banking application.
- I recommend m-banking application to those who seek my advice about such matters.
- I encourage friends and relatives to use m-banking MB application.

# IV

## CONTINUOUS MOBILE BANKING USAGE AND RELATIONSHIP COMMITMENT – A MULTI-COUNTRY ASSESSMENT

by

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