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MOBILE BANKING ADOPTION: A SYSTEMATIC REVIEW AND DIRECTION FOR FURTHER RESEARCH

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ABSTRACT

In an environment marked by the growing popularity of mobile technologies, the importance of electronic channels such as mobile banking for banking establishments is no longer to be demonstrated. However, its adoption by users remains a subject of debate due to the multitude of adoption factors cited in previous works as well as the different models of technology adoption used by researchers. This study is a systematic literature review which aims to examine the main theoretical models and factors of adoption that researchers used to describe the acceptance of M-banking technology and predict consumer intent to use it. The main results show that the literature is marked by the dominance of certain theoretical models. However, it remains divided in regards to mobile banking adoption factors with over 61 factors identified. The present article is an update of current knowledge by identifying in quality literature existing relationships in the field of M-banking but also by formulating recommendations in favor of practitioners as well as underlining new research opportunities in favor of theorists in the area of M-banking.

Keywords: *Mobile Banking, Customers Adoption, Technology Acceptance Model, Systematic Review.*

1. INTRODUCTION

Due to increased competition within banking institutions and the growing use of new information and communication technologies, mobile banking (M-banking) was born in banks all over the world from the 1990s and quickly established itself as a full-fledged communication channel allowing to strengthen the customer relationship but also to provide a multitude of advantages in terms of convenience and profitability.

Based on several theoretical models, many works tried to understand the attitude of banking customers in face of new E-banking technologies and more particularly mobile banking, which is one of its main components. These researchers highlight several factors favoring the use of M-banking and try to understand the extent to which the adoption of this channel contributes to improve customer relationship.

This work is a synthesis of several research from recognized scientific databases. The aim is to provide an overview in the field of M-banking adoption, to highlight the gaps that may be the subject of future studies and to provide practitioners a scientific base from 26 countries around the world, especially in the Asian continent such as Malaysia [1], Thailand [2], Taiwan [3], Korea [4, 5], China [6] , Vietnam [7], Indonesia [8], Bangladesh [9], Turkey [10], Jordan [11], Saudi Arabia [12], Iran [13], Oman [14, 15], Pakistan [16], in Europe in Portugal [17, 18], Spain [19], Finland [20], England [14], Greece [21], in South America in Brazil [22], in North America in the United States [23, 24, 25], Canada [26], in Africa in Mozambique [27], Ghana [28], Egypt [25, 29] and Morocco [30].

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The following section contains a brief overview of mobile banking, before moving to the research methodology used in this literature review then to the presentation of the main results of the analysis in terms of theoretical models and technology adoption factors as well as some conclusions and recommendations in favor of theoreticians and practitioners in this field of research.

2. MOBILE BANKING

The acceleration of mobile banking could initially be attributed to the technological advance in the mobile telephony market and telecommunications technology [11]. Shareef and al [9] explain that in the structure of the delivery channels of mobile banking services, the two key stakeholders are users, i.e. customers and service providers, ie banks. As an intermediate in this channel, the support role is played by mobile communication operators.

M-Baking represents an innovative new communication channel through which customers can interact with their banks using a portable device [31]. According to Shaikh and Karjaluoto [20], M-banking offers four access points to customers: mobile applications downloadable on Smartphone, web browsers usable on mobile, smartphone or tablet, downloadable tablet applications and Short Messaging Services which provide notifications of account information.

It is a service offered by banks or microfinance institutions to conduct financial transactions such as money transfer and bill payment and non-financial transactions such as balance inquires and checkbook request [20]. Rajaobelina and al [26] adds that the mobile banking service allows to conduct financial transactions via wireless networks with portable devices equipped with instant internet connection, these portable devices include, for example, iPods, smartphones or tablets.

By combining the definitions of several authors, we can synthesize the concept of mobile banking as internet banking service using mobile devices allowing customers to manage their finances wherever they are and to support accessibility through a set of financial and non-financial operations available 24/7. This mobile banking service complements and supports existing electronic channels such as automated teller machines, customer call centers and Internet banking services.

3. RESARCH METHODOLOGY

We have selected publications from recognized scientific databases in order to be able to establish a complete and interesting bibliography on the adoption of M-banking. As such, this literature review contains 30 publications, of which 29 were published in 23 recognized scientific databases. The following graph lists the publications selected by the scientific database queried.

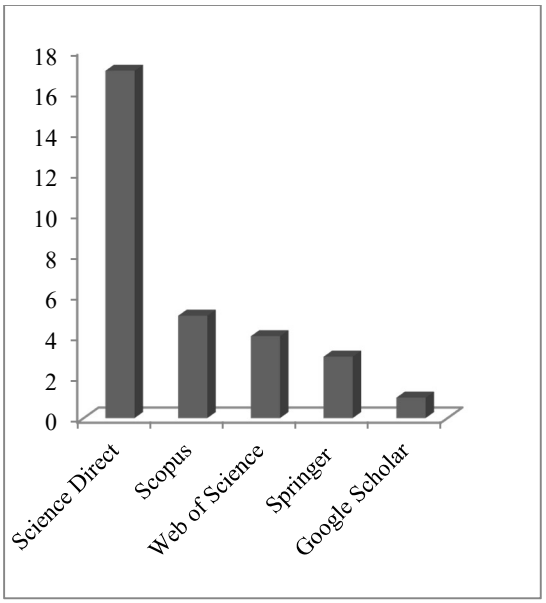

Figure 1 : Distribution of publications by database

We note the strong presence of publications coming from the Science direct database with 17 publications, followed by Scopus and Web of

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Science with respectively 5 and 4 publications. Our literature search covered several relevant journals and conference from different fields such as marketing, information systems, finance and management. We therefore included in our research scientific articles and conference proceedings.

To constitute our systematic literature review we have implemented search filters by keyword (mobile banking, M-banking, technology adoption, behavior, technology use...), by year of publication in order to visualize the latest research trends around our topic (Figure 2), by research area (marketing, management science, information system), and by country of publication to be able to constitute an overview covering 26 countries all over the world (Table 1).

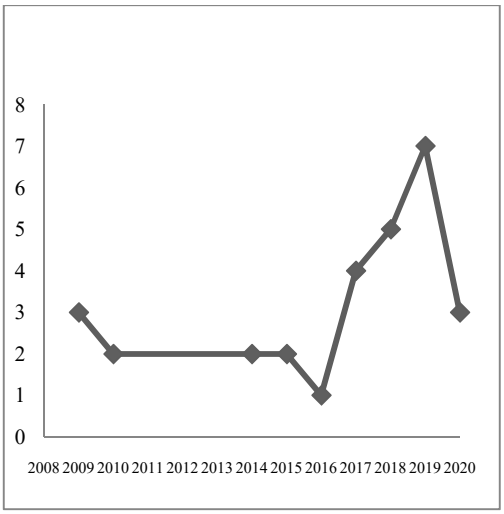

Figure 2 : Distribution of publications by year

Figure 2 shows that the first research work of this study dates from 2009 with an increase in publications in the field of M-banking from 2016 and a maximum of scientific publication in 2019.

The country whose work is most present in this study is the United States of America with 10% of publications followed by Portugal, Egypt, Oman and Korea with 6% of publications each, then 21 other countries from various continents listed below.

Table 1: Distribution of publications by country

Country	Number of publication
United States of America	3
Portugal	2
Egypt	2
Oman	2
Korea	2
Iran	1
Taiwan	1
Malaysia	1
Saudi Arabia	1
Thailand	1
Jordan	1
Pakistan	1
Mozambique	1
United Kingdom	1
Brazil	1
Spain	1
China	1
Morocco	1
Sub-Saharan Africa	1
Turkey	1
Vietnam	1
Greece	1
Ghana	1
Canada	1
Bangladesh	1
Indonesia	1
26 Country	

The analysis of the literature review shows a dominance of quantitative survey studies by questionnaire at 97% for empirical data collection (only one conceptual study) as well as a mostly hypothetico-deductive mode of reasoning (Figure 3).

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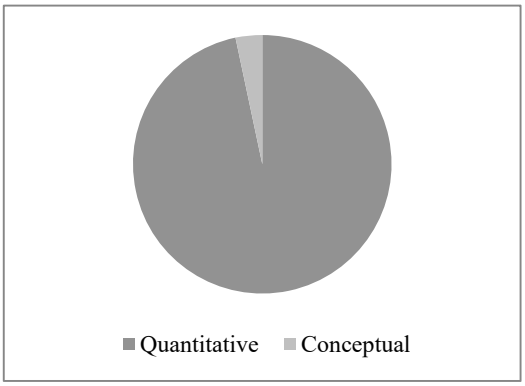

Figure 3: Distribution of publications by research methodology

The samples analyzed are mainly customers of banking sector with a single study composed of mixed sample with staff of banks. The smallest sample of this literature review is made up of 103 individuals while the largest is made up of 3,585 individuals and the average sample size of these works is 460 persons.

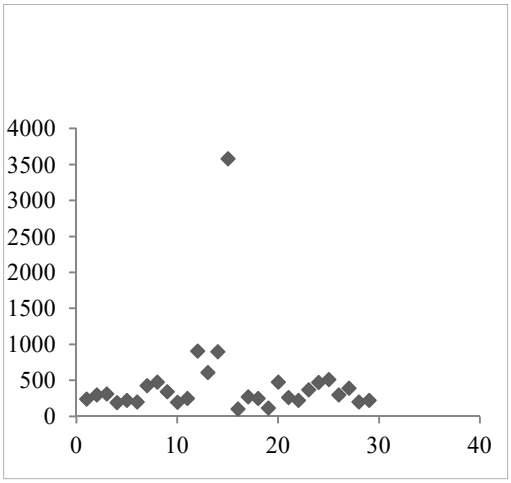

Figure 4 : Distribution of publications by sample size

The literature on mobile banking includes several theoretical models of technology adoption established by many authors with the aim of explain the adoption of this bank communication channel among customers.

We carried out a first analysis of the literature review through a classification by theoretical model adopted in publications (Table 2) in order to highlight the theoretical foundations which most marked the previous work.

Table 2: Occurrences of theoretical models by publications

Theoretical Model	Frequency in Number	Frequency in Percentage
TAM	10	33%
UTAUT	8	27%
UTAUT 2	6	20%
Authors conception	6	20%
ISSM	5	17%
TTF	5	17%
ITM	2	7
TRA	1	3%

Then, we started a second more detailed content analysis of M-banking adoption (Table 3). We have carefully identified 61 factors of mobile banking adoption which were cited by the authors of this
literature review.

The following table groups together all these factors as well as their frequency of occurrence in number and percentage in each of the selected articles. Frequency refers to the number of times an antecedent of M-banking adoption has been used. We have ranked the adoption factors in descending order of their frequency.

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Table 3: Occurrences of mobile banking adoption factors by publications

Mobile Banking adoption factors	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Frequency in Number	Frequency in Percentage
Trust			X	X					X	X			X	X	X		X	X				X		X		X	X	X	X	X	18	60%
Social influence				X			X	X	X	X	X		X	X	X		X		X					X	X	X				X	15	50%
Performance expectancy				X			X	X	X	X	X				X				X					X	X	X				X	12	40%
Behavioral Intention				X				X	X	X	X	X	X		X							X	X	X						X	12	40%
Facilitating conditions				X			X	X	X	X	X	X	X						X						X					X	11	36%
Effort expectancy				X			X	X	X	X	X				X				X											X	9	30%
Perceived usefulness												X	X	X			X			X		X	X								7	23%
Perceived ease of use												X	X	X			X			X			X	X							6	20%
Price value							X		X		X				X									X			X				6	20%
Satisfaction	X		X		X		X											X							X						6	20%
Information quality					X		X											X							X				X		5	17%
Perceived risk														X		X				X			X			X					5	17%
System quality					X		X						X					X							X						5	17%
Hedonic motivation							X	X	X		X				X																5	17%
Task fit technology				X		X				X									X											X	5	17%
Habit							X				X				X												X				4	13%
Intention to use					X									X			X			X											4	13%
Perceived security															X		X			X									X		4	13%
Gender, Masculinity/ feminity				X						X	X																X				4	13%
Service quality					X		X																		X						3	10%
Age				X						X																	X				3	10%
Compatibility																						X	X	X							3	10%
Service experience											X															X		X			3	10%
Uncertainty avoidance						X					X																		X		3	10%
Individualism/ collectivism						X					X																				2	7%
Usage barrier												X								X											2	7%
Tradition barrier												X								X											2	7%
Image barrier												X								X											2	7%
Cost																X				X											2	7%
Subjective norms																							X		X						2	7%
Commitment	X																											X			2	7%

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Security								X																						1	3%
Willingness to re-visit	X																													1	3%
Involvement	X																													1	3%
Functionality		X																												1	3%
Content		X																												1	3%
Customer service		X																												1	3%
Interface design		X																												1	3%
Firm reputation				X																										1	3%
Individual performancce						X																								1	3%
Demographic factors											X																			1	3%
Value barrier											X																			1	3%
Risk barrier											X																			1	3%
Social and cultural factors											X																			1	3%
Innovation resistance											X																			1	3%
Familiarity with bank												X																		1	3%
Perceived confidentiality														X																1	3%
Unsuitable device															X															1	3%
Lack of relative advantage															X															1	3%
Complexity															X															1	3%
Lack of information															X															1	3%
Lack of observability															X															1	3%
Interface design quality																	X													1	3%
Attitude towards technology																X														1	3%
Mobility access																					X									1	3%
User experience																									X					1	3%
Education level																									X					1	3%
Perceived awareness																											X			1	3%
Perceived ability to use																											X			1	3%
Perceived fonctional benefit																											X			1	3%
Perceived image																											X			1	3%

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4. RESULTS

4.1 Main theoretical models of M-banking adoption

The analysis by theoretical model highlights the presence of 6 recognized models to which are added some models self-developed by the authors [23, 13, 3, 1, 27, 9]. We note a dominance of the Technology Acceptance Model of Davis and his co-authors at 33% of publications followed closely by the Unified Theory of Acceptance and Use of Technology UTAUT by Venkatesh and his co-authors model with 27% then by the second version of UTAUT model with 20%. These three models are present in 70% of the publications analyzed (Figure 5).

Some models such as the Initial Trust Model ITM and the Reasoned Action theory TRA were rarely used to explain adoption factors of M-banking in this literature review with respectively 2 and 1 publication. This review of existing research on mobile technology adoption also allowed us to see that several authors have combined two or more theoretical models in their works or have incorporated new explanatory variables into these models in order to deeply understand M-banking adoption.

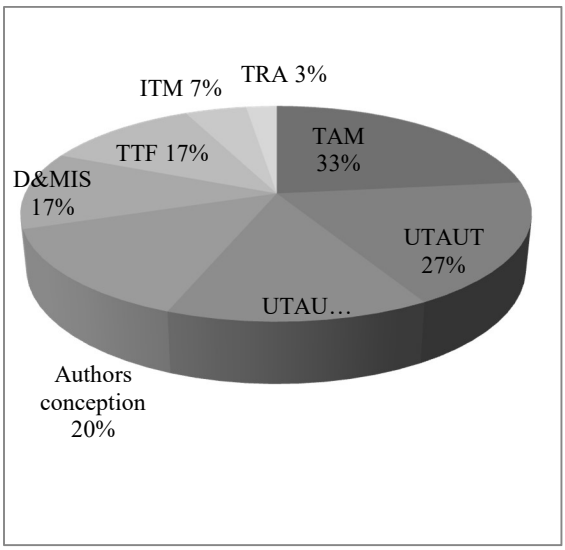

Figure 5 : Distribution of publications by Theoretical Model

4.2 Main factors of M-banking adoption

Identifying the factors that influence the level of actual use of a technology is a key objective to change the characteristics of a technological service in order to make its adoption more attractive [12]. The Analysis of the existing literature review allows us to see that the assessment of mobile banking adoption factors is potentially complex given the multitude of variables that influence the adoption decision process that we have transcribed (61 variables).

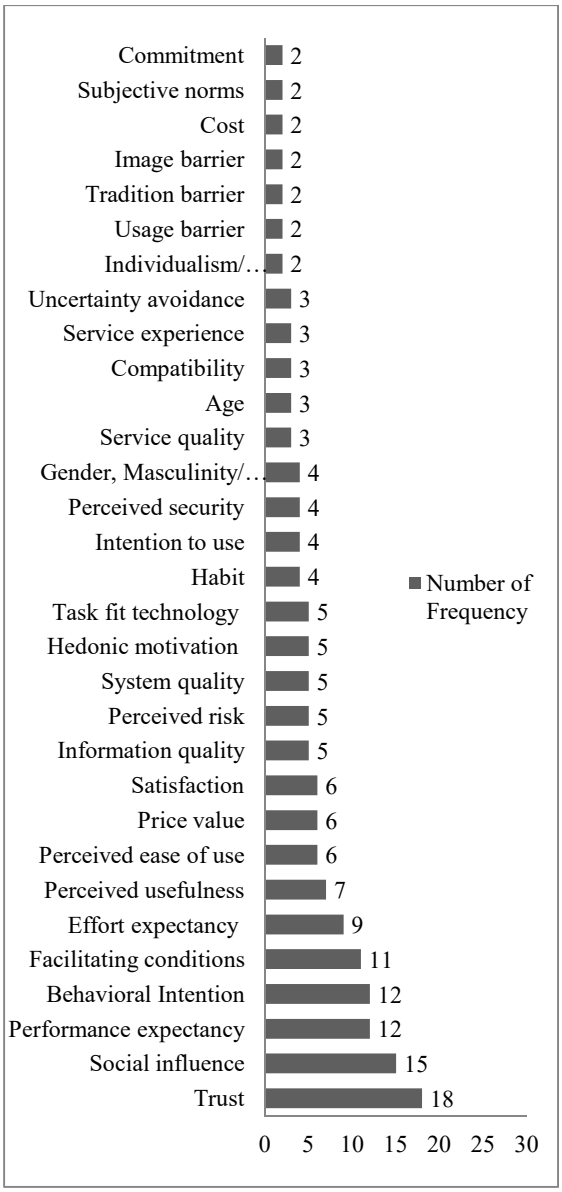

Figure 6: Frequency of M-banking adoption factors

However, based on our content analysis, we see the dominance of certain adoption factors in most of the research (Figure 6). The first five variables most present in our study are respectively trust, social influence, performance expectancy, behavioral intention and facilitating conditions.

These factors relate directly to the TAM, UTAUT and UTAUT 2 models, which confirms a second time the predominance of these models in previous studies. Trust is the independent variable that has been introduced the most in various theoretical models with a frequency of occurrence of 60% to predict M-banking adoption.

We also note the very low presence of certain M-banking adoption factors, such as perceived image, education level, interface design quality or even complexity, which were mentioned only once (3% each) in our literature review

4.2.1 Trust

This is the most frequent adoption factor of M-banking which was identified on 18 articles in our literature review [21, 7, 29, 8, 28, 26, 9]. Trust is an element that often comes up in the literature as key dimension, especially in the financial sector where bank operations have high risk.

In mobile banking, customer trust can be defined as their intention to use M-banking services by doing online banking transactions without being able to review and verify their bank's work with the conviction that their bank will honor its obligations in complete security and confidentiality. According to Le and al [7], it is the degree of customer confidence in the organization, in the way in which it will manage their transactions safely and respect the confidentiality of their personal information.

Therefore, in the context of mobile banking, if customers believe that used technologies are reliable, they will be more likely to rate all services favorably, which in turn will lead to better user satisfaction [1].

Customers susceptibility to security and risk can significantly hinder successful adoption of M-banking [9]. Internet fraud and computer virus are also threats that can affect user trust and block adoption of mobile banking services. These risks can be controlled by banking institutions by introducing a set of measures such as reliable user authentication, complete privacy and uninterrupted service availability.

4.2.2 Social influence

Social influence is a mobile banking adoption factor introduced by Venkatesh and his co-authors in the UTAUT and UTAUT 2 models. It was cited in 50% of the analyzed articles [16, 12, 27, 4, 25, 19, 17].

Social influence is the extent to which consumers perceive that other important people such as family and friends believe that they should use a particular technology [32]. According to several authors, the preferences and values of family members, friends, and others entourage using mobile technology tend to change user perceptions.

4.2.3 Performance expectancy

Performance expectancy is the strongest predictor of behavioral intention in the UTAUT model of Venkatesh and his co-authors. It is defined by these authors as the extent to which people believe that using mobile banking will help them more.

Thus, performance expectancy can be perceived because of the convenience of the service, its availability 24 hours a day and 7 days a week and also its speed compared to traditional banking operations. In general, customers seem to be more motivated to use and accept new technologies if they perceive it to be more advantageous and useful in their daily life [11].

Customers intention to use mobile banking services is predicted by performance expectancy in 40% of the analyzed literature [11, 23, 2, 7, 14, 9, 6].

4.2.4 Behavioral intention

According to Le and al [7], behavioral intention is defined as the willingness of customers to accept and use mobile banking services. As well as performance expectancy, it positively influences the adoption of mobile banking services in 40% of the analyzed publications [16, 11, 27, 2, 4, 17].

Behavioral intention is a predictor of technology adoption used in both TAM model of Davis and al (1989) [33] and in the UTAUT and UTAUT2 models of Venkatesh and al [32]. These authors explain that a person's adoption of a specified behavior is determined by their behavioral intention to execute that behavior.

4.2.5 Facilitating conditions

Several authors have indicated the role of facilitating conditions in the adoption of Mobile Banking. In this work, 36% of studies mentioned this factor in the adoption of M-banking [11, 8, 17, 9 ,6]. Facilitating conditions refer to "consumers' perception of the resources and support available to adopt a behavior" [34]. They are defined as the extent to which a person believes that the organization and its technical infrastructure exist to support her in using a new system [17].

Therefore, customers may be more motivated to use mobile banking services if they have a certain level of service and support resources and whether they perceive mobile banking to be compatible with other technologies that they already use [11]. Some authors such Baptista and Oliveira [27] propose numerous measures to remedy these constraints such as the implementation of online tutorial on mobile banking services, demonstration videos or support chat with bank staff.

5. CONCLUSION

With the growing orientation towards mobile telephony and the increasingly popular use of the internet all over the world, it is evident that consumers could migrate from traditional forms of banking transactions to mobile banking services. However, the success of the implementation of M-banking services will largely depend on the way which customers will be motivated to adopt this technology [11].

This work provides a synthesis of several works published between 2009 and 2020 in 26 developed and developing countries in more than 24 different sources with an average sample of 460 individuals. This state of the art shows that several theoretical models of technological adoption mark the literature of M-banking. Some of these models have been the subject of few studies such as Theory Reasoned Action (TRA), Initial Trust Model (ITM), Task Fit Technology (TTF) and Information Systems Success Model (ISSM).

While others are at the heart of research in the field of mobile banking such as TAM, UTAUT in its first and second version. We also point out that some authors (20% of the works analyzed) have chosen to design their own theoretical model independently of the aforementioned theoretical foundations.

The aim of the authors was to understand the adoption of M-banking from consumers perspective on the basis of several antecedents. As such, we note a wide variety of adoption factors present in the literature of which 61 factors were identified in this work. Despite this diversity, some factors stand out with a strong recurrence, it is in particular trust, social influence, performance expectancy, behavioral intention and facilitating conditions.

6. LIMITATIONS

Because this paper is a systemic literature review of previous studies, the first limitation is

that no quantitative survey using questionnaires or a qualitative survey through in-depth interviews with practitioners or customers have been used. In addition, this study includes a relatively small number of research papers and focuses on mobile banking, which is just one of many electronic banking channels offered by banks to their customers.

7. FURTHER RESEARCH DIRECTIONS

The limitations of this work may be a starting point for future research. First, the research work analyzed began in 2009 while mobile banking has existed in different forms such as SMS Banking since the 1990s. Future studies covering a larger time axis can provide a broader view of the evolution of this digital channel and its adoption since its emergence.

Secondly, no qualitative study was performed by the researchers of this literature review. Indeed, all the surveys were carried out by questionnaire and no data collection was done by interview. Future research could adopt a qualitative approach or a combination of quantitative and qualitative approaches in order to better understand consumer behavior with regard to M-banking.

Thirdly, the majority of studies focus on a single country or even a single city and few comparative studies between countries have been carried out in this literature review. Indeed, in this paper, only Hassan and Wood [25] have recently opted for cross-national research between the United States and Egypt. This kind of work would allow us to measure the impact of cultural factors on mobile banking adoption.

Finally, longitudinal studies examining the different phases of technology adoption have been rarely done in this research area. Although all the works analyzed are transversal, only the work of Shareef and al [9] studied M-Banking according on the different adoption stages. Research spread over time could help to observe and follow the adoption of mobile banking in order to better understand it.

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