

# A Systematic Review and Weight Analysis of Mobile Financial Services Adoption Literature from 2011 to 2021

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## SUMMARY

*The global extent and use of the internet and mobile have increased the importance of mobile financial services (MFS) and payments. However, only limited numbers of review studies are accessible on the topic. Therefore, this paper aims to offer a systematic literature review (SLR) methodology and perform a weight analysis of articles published between 2011 and 2021. By reviewing 61 studies, the results indicate that the unified theory of acceptance and usage of technology (UTAUT) followed by the technology of acceptance model (TAM) are the main conceptual frameworks and models adopted. It reveals that attitude, perceived ease of use, performance expectancy, habit, social norms, and perceived usefulness are the best behavioral intention predictors. The critical technological factors of using MFS were provided, followed by future research opportunities.*

*Keywords: Mobile banking; mobile payment; mobile money; mobile wallet; mobile financial services; systematic literature review*

*Journal of Economic Literature (JEL) code: M21, M29, G21, G23*

*DOI: <https://doi.org/10.18096/TMP.2022.02.02>*

## INTRODUCTION

The rapid rise in the growth of mobile technology throughout the world is a phenomenon that has been mainly notable among poor people, primarily due to the prepaid model. Since their importance in disseminating information, particularly the innovations related to mobile money services, mobile technology has been acknowledged worldwide to deliver financial services. With the expansion in the coverage of mobile phone networks and accelerating user growth, mobile financial services have become a powerful channel for the banking industry to offer its customers a wide range of services, overcoming temporal and spatial hindrances. Due to their unique features, such as always-on availability, mobility, and personalized small devices, mobile phones have promptly spread in developed and most developing nations to overcome geographical and socio-economic barriers. Indeed, mobile technology has the potential to allow two primary questions to be addressed simultaneously: from the demand

perspective; it represents a possibility for financial inclusion among a population that is underserved by traditional banking services. From the supply angle, it opens up the opportunity for financial institutions to deliver a great diversity of services at low cost to large customers of the poorest sections of society and people living in remote areas.

Mobile financial service (MFS) is a broad term that encompasses a variety of financial services that can be conducted on a mobile phone (Gbongli et al., 2020). The typology of mobile financial services entails three leading forms: mobile banking, mobile payment, and mobile money transfer (Gbongli et al., 2020) (FIRPO, 2009). Mobile banking is an additional medium for prevailing customers to interact with the bank. It enables them to open new bank accounts, gain account information, check their balance, block missing cards, transfer funds, obtain branch and ATM locations, and even make financial investments. Mobile payment enables users to make person-to-business payments for goods and services through mobile phones either at the

point of sale terminal or remotely. The customers are gradually using these services as it increases their convenience by excluding the need for coins and cash for small transactions. Mobile money refers to the service that allows users to transfer money between people with less access to bank accounts (Kim et al., 2018) (Gbongli et al., 2019). The GSMA (2021) report indicates that in 2020, there are 1.2 billion registered mobile money accounts, 5.2 million unique agent accounts globally, 310 mobile money deployments are live in 96 countries, and a 17 percent year-on-year increase in the accounts (GSMA, 2021). Total mobile money transaction values grew by 22 percent in 2020 to reach \$767 billion. Therefore, the industry is unprecedentedly processing over \$2 billion daily while having more than doubled in value since 2017. Accordingly, the GSMA expects this value to surpass \$3 billion daily by 2022.

These trends recommend that significant growth opportunities remain, leading to predictions of potentially massive increases in mobile money users. Although mobile money services seem to be incredibly promising, there is still a need to understand their growth potential and grow this potential fully (Gbongli et al., 2017). Despite such prevalent adoption of smartphones and internet networks, the adoption ratio of mobile financial services is comparatively low (Deb & Agrawal, 2017) (Thakur & Srivastava, 2014) (Gbongli et al., 2020), and the financial industry has faced resistance from customers who were skeptical and reluctant to adopt these novel services. Due to these challenges, financial services must continuously assess customers' readiness to adopt technology-based mobile financial to offer adequate services that provide the best value for both the consumer and the service provider.

Several studies use qualitative and quantitative methods to analyze mobile financial services (MFS) and related factors that impact consumers' adoption. Despite substantial research on MFS initiatives revealed in international journals across disciplines, there have been scant attempts to provide an integrative model that improves our understanding and explains MFS adoption. Additionally, our examination of the literature background elucidated that the general studies are spread across various areas and contexts in which adoption has been studied. Such fragmented literature makes it challenging for scholars to build upon the existing knowledge and advance the research in the area. Considering the complex nature of MFS as a merging of mobile and financial services, MFS as a focus of research deserves analysis on a broad range of issues surrounding the seamless connection and coordination of these different factors.

To help researchers overcome this challenge, we suggest organizing the literature in the area and critically synthesizing it for future reference. Towards this prospective, the current study proposes to employ the systematic literature review (SLR) methodology and perform weight analysis, which provides an extensive way assessment of the related work, and yields

numerous advantages as discussed by earlier SLR studies (Behera et al., 2019) (Seth et al., 2020). Based on the weight analysis, the current research will reconcile conflicting evidence and draw a "big picture" in mobile financial services research. The study further proposes highlighting the critical technological factors of using mobile financial services, which contribute to an opportunity for financial services to build the right mobile financial for human needs.

Following earlier systematic review studies, the remaining sections are organized as follows. Section 2 offers a brief overview of the methods used to ascertain the relevant research included in this review. Section 3 focuses on the general characteristics of the selected studies and the key themes emerging from existing research. Section 4 conducts weight analysis and outlines the findings. The following section assesses the critical technological factors of MFS. Finally, this study concludes with research limitations and future research directions.

## METHODOLOGY

We adopted an established research technique for systematic literature reviews to analyze the literature on mobile financial services (MFS) and derive a comprehensive classification of its determinants. A systematic review remains a literature review that intends to answer a formulated question on the topic(s) by finding, describing, and assessing evidence from all published work associated with that question within a particular set of boundaries (Eriksson, 2014). This technique has several advantages over traditional narrative reviews. However, narrative reviews are built mainly on the experience and subjectivity of the author. They generally exclude a section describing the related papers' data sources and localization strategy. This clues to several methodological flaws, especially the non-inclusion of significant contributions, which can bias the author's conclusions (Cipriani & Geddes, 2003) (Fradet, 2013). Therefore, there is evidence that systematic reviews mitigate chance effects, enhance the legitimacy and authority of the ensuing evidence, and offer more consistent outcomes upon which to draw conclusions and make decisions (Waddington et al., 2012) (Fink, 2014). Five steps are generally followed when performing a systematic review of the literature (Booth et al., 2016): (1) formulation of research questions; (2) establishing of inclusion and exclusion criteria; (3) identification of relevant studies; (4) assessment of selected studies; and (5) summary and report of the findings.

### *Inclusion and exclusion criteria*

Based on (Wu et al., 2021), Inclusion and exclusion criteria were settled to select material related to our

study, create a boundary, and limit our methodology's scope. Table 1 displays these criteria and their rationale for inclusion or exclusion.

*Table 1*  
*Inclusion and exclusion criteria*

Criteria	The rationale of the criteria
<b>Inclusion criteria</b>	
Topic: Articles where mobile financial services (mobile financial services; mobile banking/m-banking; mobile payment/m-payment, mobile wallet/m-wallet; mobile money are explicitly mentioned as the main topic	The present study's central concept is the adoption of mobile financial services. With this criterion, we consider that articles focusing on or related to this topic can be identified
Document type: Empirical and conceptual academic articles published in peer-reviewed journals	As recommended by (K. Rhaiem & Amara, 2021) and (Voight & Hoogenboom, 2012), this criterion is applied to warrant the quality of the used material. It is expected, however, that empirical studies lead to a more sound and relevant comparative analysis
Covered period: 2011-2021	There was a review of work on Mobile Money and Payment from 2001 to 2011 conducted by (Diniz et al., 2011). Since studies on mobile financial services are recent, the timespan's starting year of publications on this topic was not fixed. This allows us to identify the earliest study on the topics.
Language: English	(K. Rhaiem & Amara, 2021) stressed that 75–90% of total academic articles in the leading scholarly business journals are published in English
<b>Exclusion criteria</b>	
All forms of publications other than research articles published in academic journals	This criterion is adopted due to time and resource limitations. Publications like books, book reviews, conference proceedings, theses, and professional publications were excluded. This criterion enables to include material published in academic journals merely
Articles written in a language other than English	Though the authors master different languages, the vast mainstream of researchers is likely less exposed to publications in a language other than English. Thus, compared to English published, the articles' potential effect of non-English publications on the academic area is likely to be limited. This criterion is added to exclude articles with abstracts in English, but the main text is written in other languages than English

Source: author's based on K. Rhaiem & Amara (2021)

### *Search strategy*

Following the earlier works on the adopted procedure (M. Rhaiem, 2017) (K. Rhaiem & Amara, 2021), the crucial keywords were identified based on the authors' expertise and after reading 15 recently published articles in the field of mobile financial services (mobile banking, mobile payment, and mobile money). The electronic search was performed using an adapted query incorporating the Boolean operators "AND" and "OR".

The present study used the following keywords to search relevant research outputs using the Scopus database: ("Mobile Financial" OR "Mobile Payment" OR "Mobile wallets" OR "M-Payment" OR "M-Banking" OR "Mobile Banking" OR "Mobile" OR "m-money" OR "mobile money") AND ("Adoption" OR "Acceptance") AND ("Financial service"). The performed keyword search returned 329 articles. The subsequent step involved evaluating each article's title, keywords, and abstract to check whether all the inclusion and exclusion criteria were acknowledged.

This procedure recommended the exclusion of 122 articles from the list. Several of these rejected articles were concerned more with ATM adoption, m-shopping, apps adoption, mobile services in general, and m-commerce, to mention a few. The remaining 207 research papers were passed through quality screening employing the most recent journals' ranking of the ABDC (Australian Business Deans Council) and the ABS (Association of Business Schools). Only papers published in journals ranked (1) as A\* (best or leading journal in its field), A (highly regarded journal in the field or subfield), and B (well-regarded journal in the field or subfield) (hence, excluding C and D ranked journals) with the 2022 ABDC journals' ranking or (2) as 4\* (world's elite journal), 4 (top journal), 3 (highly regarded journal), and 2 (well-regarded journal) concerning the latest 2021 ABS ranking, were retained. The result of this quality screening led to the elimination of 146 articles. Therefore, 61 articles were booked. Next, an in-depth examination and reading were carried out to further evaluate the retained articles' eligibility. This step confirmed that the 61 included articles matched all the criteria and were eligible for consideration in the systematic review.

## GENERAL CHARACTERISTICS OF THE SELECTED STUDIES AND DISCUSSION

### *Distribution of the articles by publication outlet*

Table 2 revealed that studies on mobile financial services were published in 13 various journals. With no surprise, The International Journal of Bank Marketing rated first with 8 articles (13.11%), followed by

Computers in Human Behavior with 7 publications (11.48%) and to mention a few. Out of the 61 retained articles, 31 (50.81%) were in Information System/ Information Management area, 18 (29.51%) in the Marketing/ Tourism/ Logistics area, 8 (13.11%) in the Management area, 3 (4.92%) in the Marketing area, and 1 (1.64%) in the Finance area. Based on the 2022 ABDC journals' ranking, the majority of articles (30 articles or 49.18%) were published in journals ranked A, whereas only 7 articles (11.47%) were published in journals ranked A\*, and 13 articles (21.31%) were published in journals ranked B. There are 5 articles published in four Journals that were not found in the 2022 ABDC journals' ranking but listed under the 2021 ABS journals' ranking. Concerning the 2021 ABS journals' ranking, 24 articles (39.34%) were published in journals classified 1, 28 articles (44.90%) were published in journals classified 2, and 8 articles (13.11%) were published in journals classified 3. Only one article was published in a journal that is not found in the 2021 ABS journals' ranking but was listed in the 2022 ABDC journals' ranking.

Regarding the Analysis of journals by citations, apart from the number of articles, the contribution of a particular journal can also be evaluated by h-index, implying that a number, h, of journal publications have been cited h times. This measure can be considered one of the genuine indicators for influencing the publishing activity of the journal in the research area under consideration. In this study, the journal with the most impact is the Journal of Business Research, associated with an h-index of 217. An h-index of 217 implies that this number of publications has been cited at least 217 times. Table 2 shows the journals ordered by the number of documents published and the impact measured with the h-index.

Table 2.  
*List of journals with the most productivity and impact on MFS (2011- 2021)*

Academic journals	2022 ABDC	2021 ABS	Impact factor	Subject area	Articles	%	H-Index
International Journal of Bank Marketing	A	1	4.412	MRK, TRM/LG	8	13.11%	87
Computers in Human Behavior	A	2	6.829	IS	7	11.48%	203
International Journal of Information Management	A*	2	14.098	IS	6	9.84%	132
Journal of Theoretical and Applied Electronic Commerce Research	B	1	3.049	IS	3	4.92%	33
Australasian Journal of Information Systems	A	1	2.317	IS	2	3.28%	22
Journal of Electronic Commerce Research	B	1	2.861	IS	2	3.28%	37
Journal of Islamic Marketing	B	1	3.418	MRK, TRM/LG	2	3.28%	43
Journal of Enterprise Information Management	A	2	5.396	IS	2	3.28%	67
Journal of Retailing and Consumer Services	A	2	7.135	MRK, TRM/LG	2	3.28%	104

Service Industries Journal	B	2	5.7	MRK, TRM/LG	2	3.28%	70
Technology Analysis and Strategic Management	B	2	2.874	MGT	2	3.28%	72
Technological Forecasting and Social Change	A	3	8.593	MGT	2	3.28%	134
Psychology and Marketing	N/A	3	2.939	MKT	2	3.28%	124
Transportation Research Part C: Emerging Technologies	A*	N/A	8.089	MRK, TRM/LG	1	1.64%	147
Journal of Organizational Computing and Electronic Commerce	A	1	2.571	IS	1	1.64%	43
Aslib Journal of Information Management	B	1	1.903	IS	1	1.64%	44
Information Technology and Management	B	1	2.627	IS	1	1.64%	39
International Journal of Emerging Markets	B	1	2.488	MRK, TRM/LG	1	1.64%	32
Journal of Internet Commerce	B	1	3.892	MGT	1	1.64%	31
Service Business	B	1	2.791	MRK, TRM/LG	1	1.64%	36
Social Responsibility Journal	B	1	2.209	MGT	1	1.64%	37
Electronic Commerce Research	A	2	3.747	IS	1	1.64%	82
Journal of Computer Information Systems	A	2	3.41	IS	1	1.64%	66
Journal of Strategic Marketing	A	2	2.4	MRK, TRM/LG	1	1.64%	56
European Management Journal	B	2	5.075	MGT	1	1.64%	109
Thunderbird International Business Review	B	2	1.841	MGT	1	1.64%	42
Electronic Commerce Research and Applications	N/A	2	6.014	IS	1	1.64%	82
International Journal of Retail and Distribution Management	N/A	2	3.771	MKT	1	1.64%	87
Information Systems Frontiers	A	3	6.191	IS	1	1.64%	73
Internet Research	A	3	6.773	IS	1	1.64%	94
Journal of Business Research	A	3	7.55	IS	1	1.64%	217
International Journal of Finance and Economics	N/A	3	3.070	FINANCE	1	1.64%	41

Notes: Information Systems (IS); Management (MGT); Marketing/ Tourism/ Logistics (MRK, TRM/LG); Marketing (MKT); Not Available (N/A)

Source: Own calculations

*Publication trend and investigated countries*

Table 3 illustrate the detailed publishing timeline of the studies included. The majority of studies (52 of 61 or 85.24%) included in this review were published between 2015 and 2021. It is the period where the publication trend has increased to reach, so far, a peak of 14 articles

(22.95%) in 2020. Scholars’ growing interest in mobile financial services implies that various providers gradually adopt this new service. Therefore, the distribution of the selected empirical studies by country/region showed that the most studied countries are the United States, Spain, and India, with a frequency of 6 each (i.e., 9.83% each) (See Table 4).

*Table 3  
Authors contributing to the literature on mobile financial services/year*

Years	Number of articles	Authors
2011	1	(Lin, 2011)
2012	5	(Zhou, 2012), (Yu, 2012), (Al-Jabri & Sohail, 2012), (Peng et al., 2012), (Keramati et al., 2012)
2013	0	N/A (Not Available)
2014	3	(Oliveira et al., 2014), (Goh & Sun, 2014), (Francisco Liébana-Cabanillas et al., 2014)
2015	8	(E. L. Slade et al., 2015), (Gonçalo Baptista & Oliveira, 2015), (Al Khasawneh, 2015), (E. Slade et al., 2015), (Koenig-Lewis et al., 2015), (Francisco Liébana-Cabanillas et al., 2015), (Di Pietro et al., 2015), (Lu et al., 2015)
2016	5	(Tam & Oliveira, 2016b), (Tam & Oliveira, 2016a), (Yen & Wu, 2016), (Oliveira et al., 2016), (Alalwan et al., 2016)

2017	7	(Khalilzadeh et al., 2017), (Bailey et al., 2017), (Gupta & Arora, 2017), (Alalwan et al., 2017), (Goncalo Baptista & Oliveira, 2017), (Changchit et al., 2017), (F. Liébana-Cabanillas & Lara-Rubio, 2017)
2018	4	(Johnson et al., 2018), (Farah et al., 2018), (Francisco Liébana-Cabanillas et al., 2018), (Su et al., 2018)
2019	7	(Sharma, 2019), (Raza et al., 2019), (Giovanis et al., 2019), (Baabdullah et al., 2019), (Hussain et al., 2019), (Owusu Kwateng et al., 2019), (Kalinic et al., 2019)
2020	14	(S. Singh, 2020), (Alhassan et al., 2020), (Patil et al., 2020), (Suhartanto et al., 2019), (Thusi & Maduku, 2020), (Verkijika, 2020), (Kalinić et al., 2019), (Moorthy et al., 2020), (N. Singh et al., 2020), (Changchit et al., 2020), (Talwar et al., 2020), (Zhang & Mao, 2020), (Okello Candiya Bongomin & Ntayi, 2019), (Frimpong et al., 2020)
2021	7	(Jadil et al., 2021), (Wei et al., 2021), (Wu et al., 2021), (Chawla & Joshi, 2021), (Giovanis et al., 2021), (Rafidinal & Senalasar, 2021), (Purohit & Arora, 2021)
TOTAL	61	

Source: Own work

Table 4  
The geographical scope of studies

Country	Frequency	Country	Frequency
United States (USA)	6	Indonesian	1
Spain	6	South Korea	1
India	6	Mozambique	1
Taiwan	5	South African	1
Portugal	4	France	1
United Kingdom (UK)	3	Uganda	1
Malaysia	3	Italy	1
Jordan	3	Iran	1
China	3	Bangladesh	1
Pakistan	2	Thailand	1
Ghana	2	Brazil	1
Greece	2	Oman	1
Saudi Arabia	2	Unspecified African Countries	1
Indonesia	2	Unspecified (literature review data)	1

Source: Own work

### Most influential works

Assessing the prolific author offered vital information about the author's contribution and impact on the research areas. Total citations per year compare the article's influence irrespective of the year in which it was published and considered to be important indicators of influence of the articles in the area of MFS adoption behavior. From this end, it was deemed essential to identify the highly cited articles and studies that provided novel agendas for the field research.

The singularity of the Matthew effect, whereby the researcher tends to cite scholarly articles that are highly cited, is noticeable and is regarded as a better source of information. To uncover the most influential articles published in mobile financial services, we set the cut-off limit to 50 citations and considered only the 20 most highly cited papers between 2011-2021. Table 5

presents the list of highly cited mobile financial services papers published in reputed peer-reviewed journals.

The Analysis of the highly cited papers reveals the fact that (Alalwan et al., 2017), with the document title "Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust," is the highest number of citations which is 502 citations with Google Scholar Rank (GSRank) 1, significantly contributed towards mobile financial services field, particularly the mobile banking perspective. Their contribution laid the foundation for empirical research works in mobile banking by extending the Unified Theory of Acceptance and Use of Technology (UTAUT2) alongside trust and opened up new vistas of scholarly inquiry. Subsequent to their work, practicing scholars explored the field using established theoretical frameworks, and some scholars even extended the established frameworks by developing and validating new constructs which they

felt were largely missing in prior literature (Merhi et al., 2019). Furthermore, some scholars extended the methodological perspective by incorporating advanced statistical analysis in their research (Sharma, 2019).

The next highly cited article in the league has been contributed by (Lin, 2011). His work also examined the adoption behavior with mobile banking and drew upon innovation diffusion theory and knowledge-based trust

literature. The mobile banking service characteristics proposed are used mainly across different studies on mobile financial services in conjunction with established theoretical frameworks. Highly cited research works to aid in attaining theoretical development and methodological maturity and popularity across various disciplines.

*Table 5*  
*Top 20 Cited documents in the field of mobile financial services*

S. No	Authors	Title	Source Title	Cites	Cites Per Year	GSRank
1	(Alalwan et al., 2017)	Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust	International Journal of Information Management	502	100.4	1
2	(Lin, 2011)	An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust	International Journal of Information Management	499	45.36	1
3	(Oliveira et al., 2016)	Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology	Computers in Human Behavior	465	77.5	2
4	(Yu, 2012)	Factors affecting individuals to adopt mobile banking: Empirical evidence from the UTAUT model	Journal of Electronic Commerce Research	422	42.2	1
5	(Oliveira et al., 2014)	Extending the understanding of mobile banking adoption: When UTAUT meets TTF and ITM	International Journal of Information Management	397	49.63	2
6	(Gonçalo Baptista & Oliveira, 2015)	Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators	Computers in Human Behavior	391	55.86	5
7	(E. L. Slade et al., 2015)	Modeling Consumers' Adoption Intentions of Remote Mobile Payments in the United Kingdom: Extending UTAUT with Innovativeness, Risk, and Trust	Psychology and Marketing	344	49.14	3
8	(Al-Jabri & Sohail, 2012)	Mobile banking adoption: Application of diffusion of innovation theory	Journal of Electronic Commerce Research	252	25.2	3
9	(Alalwan et al., 2016)	Consumer adoption of mobile banking in Jordan: Examining the role of usefulness, ease of use, perceived risk and self-efficacy	Journal of Enterprise Information Management	240	40	11
10	(Khalilzadeh et al., 2017)	Security-related factors in extended UTAUT model for NFC based mobile payment in the restaurant industry	Computers in Human Behavior	228	45.6	1
11	(E. Slade et al., 2015)	Exploring consumer adoption of proximity mobile payments	Journal of Strategic Marketing	175	25	15
12	(Tam & Oliveira, 2016b)	Understanding the impact of m-banking on individual performance: DeLone & McLean and TTF perspective	Computers in Human Behavior	167	27.83	4
13	(Koenig-Lewis et al., 2015)	Enjoyment and social influence: predicting mobile payment adoption	Service Industries Journal	160	22.86	17

14	(Zhou, 2012)	Examining mobile banking user adoption from the perspectives of trust and flow experience	Information Technology and Management	153	15.3	5
15	(Francisco Liébana-Cabanillas et al., 2014)	The moderating effect of experience in the adoption of mobile payment tools in Virtual Social Networks: The m-Payment Acceptance Model in Virtual Social Networks (MPAM-VSN)	International Journal of Information Management	151	18.88	18
16	(Johnson et al., 2018)	Limitations to the rapid adoption of M-payment services: Understanding the impact of privacy risk on M-Payment services	Computers in Human Behavior	149	37.25	1
17	(Francisco Liébana-Cabanillas et al., 2018)	Predicting the determinants of mobile payment acceptance: A hybrid SEM-neural network approach	Technological Forecasting and Social Change	141	35.25	2
18	(N. Singh et al., 2020)	Determining factors in the adoption and recommendation of mobile wallet services in India: Analysis of the effect of innovativeness, stress to use and social influence	International Journal of Information Management	120	60	1
19	(Bailey et al., 2017)	Mobile payments adoption by US consumers: an extended TAM	International Journal of Retail and Distribution Management	103	20.6	3
20	(Patil et al., 2020)	Understanding consumer adoption of mobile payment in India: Extending Meta-UTAUT model with personal innovativeness, anxiety, trust, and grievance redressal	International Journal of Information Management	96	48	4

Source: author's based on compiled information from Scopus Database

### Mobile financial payment services

#### *Brief review of the selected papers*

This section reviews the adoption of various mobile financial services methods by providing some information on theories and models adopted, techniques for collecting and analyzing data, and studied factors influencing use and adoption behavior. However, more detail on theoretical models' occurrences and mobile financial adoption drivers are booked in the upcoming section. To ease our understanding, these drivers will be categorized into three perspectives: Technological – Personal – Environmental (TPE).

Adoption of various mobile financial payment services/ payment methods

The critical themes acknowledged in mobile financial payment services/ payment methods literature are mobile financial services, mobile payment, mobile banking, mobile wallets, and mobile money. Each theme is discussed below by using examples of related studies. Out of 61 published articles in the last decade (i.e., 2011-2021), 29 research papers (48%) were focused on mobile payment, followed by 27 research papers (44%) on mobile banking. There are only 2 articles published on mobile wallets (3%), 2 articles on mobile money (3%), and 1 article on mobile financial services (2%).

Mobile financial payment services refer to the use of a mobile phone to access financial services and execute financial transactions. For example, (Yen & Wu, 2016) predicted the antecedents of continued usage intention of mobile financial services (MFS) in Taiwan. By extending TAM with perceived enjoyment, mobility, and personal habit, the authors further examined the moderating effect of gender on customer relationships. SEM was used for survey data of 368 MFS users. It was found that perceived mobility, personal habit, perceived usefulness, and perceived ease of use were the main antecedents that impact continued usage intention in MFS. However, perceived enjoyment was found to have no statistical significance with intention. Moreover, gender moderates the relationships between the variables in the proposed model. Perceived mobility affecting usage intention will be stronger for men than for women, whereas personal habit affecting usage intention will be stronger for women than for men.

The present section reviews the study on mobile financial service adoption determinants, focusing on perceived mobility and personal habit impacts. Nevertheless, the study has some limitations, which allow fruitful future research. First, because studies on mobile financial services are relatively limited, mainly when considering the various early studies on information technology adoption and innovation diffusion, the theoretical grounds for the relationships among constructs are not robust. Second, while usage



intention is used here as a dependent variable, examining the actual usage for future work is advised.

### Mobile payment

Mobile payment denotes the payments made for goods and services using mobile devices, entailing wireless handsets, personal digital assistants, radiofrequency devices, and near-field communication-based devices (Chen & Nath, 2008). Twenty-nine studies out of 61 examined mobile payment in the context of mobile financial services during the last decade.

Four studies focused on India (S. Singh, 2020), (Patil et al., 2020), (Purohit & Arora, 2021), (Talwar et al., 2020)). For example, (S. Singh, 2020) aimed to explain users' post-adoption behavior toward mobile payment systems in India. Data were collected from 370 respondents using the unified theory of acceptance and use of technology (UTAUT) framework and the expectation confirmation model (ECM), along with two additional constructs: perceived security and trust. It was found that the integrated model has a higher predictive power to explain continuance intentions for mobile payment systems with significant elements of satisfaction, trust, performance expectancy, and effort expectancy.

(Patil et al., 2020) examined Indian consumer use behavior towards mobile payment using a Meta-UTAUT model adapted as the theoretical lens with personal innovativeness, anxiety, trust, and grievance redressal as extensions. By employing SEM for the data analysis, the empirical examination of the model among 491 Indian consumers found all proposed hypotheses to be significant. This study explained 66 % and 50 % variance in behavioral intention and use behavior, respectively.

(Purohit & Arora, 2021) investigated the factors influencing mobile banking adoption among the bottom of the pyramid (BoP) group in an emerging market. Data were collected from 332 bank customers in the BoP group through a convenient sampling method which was analyzed using structural equation modeling (SEM). It was found that perceived usefulness and ease of use positively influence the attitude toward mobile banking, while the perceived risk and perceived deterrents influence the attitude negatively. The subjective norms and the attitude positively affect mobile banking adoption. Knowledge of mobile banking has a strong effect on ease of use, but it does not influence the perceived usefulness of mobile banking.

The study of (Talwar et al., 2020) used cross-sectional data entailing 954 respondents in India to empirically tested antecedents and outcomes of initial trust based on the information systems success (ISS) model, transaction cost economics (TCE) theory and the IT continuance model as theoretical lenses. Using SEM for the analysis, the findings show that Information and service quality positively correlated with initial trust.

Initial trust is positively associated with confirmation and perceived usefulness. Perceived usefulness positively correlated with continuation intention.

Four studies also studied mobile payment in the USA ((Khalilzadeh et al., 2017), (Bailey et al., 2017), (Zhang & Mao, 2020), (Johnson et al., 2018)). (Khalilzadeh et al., 2017) aimed to assess the determinants of near-field communication (NFC) based mobile payment (MP) technology acceptance by providing an integrated model unified theory of acceptance and use of technology (UTAUT) and technology acceptance model (TAM). The model was tested using structural equation modeling (SEM) with data collected from 412 restaurant customers in the USA. It was found that facilitating conditions do not impact the intention to use NFC-based MP. Social readiness positively impacts the NFC-based MP use in restaurants. Users consider NFC-based MP as fun when they perceive it as useful. Other factors such as attitude, security, and risk are the most influential factors in NFC-based MP usage.

(Bailey et al., 2017) used survey data entailing 240 Midwestern University students in the USA to explore mobile payment adoption by extending the basic TAM with self-efficacy, new technology anxiety, and privacy concerns, particularly tap-and-go payment. By employing SEM, the finding revealed that self-efficacy significantly impacts perceived ease of use and perceived usefulness. These, in turn, impact attitude, which affects the intention to use mobile payment. Privacy concerns also affect attitudes toward mobile payment and behavior intention to use mobile payment. New technology anxiety impacts perceived ease of use but not perceived usefulness. Therefore, this study emphasizes the roles of self-efficacy and privacy concerns.

(Zhang & Mao, 2020) focused on examining the effects of consumer factors on behavioral intention to adopt mobile payments. Building upon the theory of reasoned action (TRA) and technology acceptance model (TAM), a behavioral intention model was constructed involving enhanced cognitive, affective, and social antecedents. Cognitive antecedents include the relative advantage, perceived usefulness and ease of use in the TAM, and technology characteristics (e.g., responsiveness and mobility); affective antecedents emphasize positive and negative emotions related to NFC mobile payments usage. Both antecedents are estimated to affect attitudes. In addition, social antecedents examine subjective norms and the influence of network externalities. By collecting data from 394 adult nonusers of NFC mobile payments in the United States and performing SEM analysis, the finding revealed that all three antecedents significantly affected individual consumers' intention to adopt NFC mobile payments, explaining a significant amount of variance.

(Johnson et al., 2018) investigated the impact of factors influencing m-payment service adoption by

applying the diffusion of innovation theory model and exploring the effect of perceived ubiquity, security, and privacy risk. With a sample of 270 survey responses collected using convenient sampling and analyzed using PLS-SEM, it was indicated that ease of use, relative advantage, visibility, and perceived security positively impact the individual's intention to use m-payment services. Ubiquity and trialability positively influence the individual's perception of security, while concerns over privacy risks negatively affect perceptions of security. 46.3% of respondents identified themselves as current users of m-payment services, which may suggest a renewed interest on the part of the consumer.

Six articles studied mobile payment in Spain (Kalinić et al., 2019), (Francisco Liébana-Cabanillas et al., 2014), (Kalinic et al., 2019), (F. Liébana-Cabanillas & Lara-Rubio, 2017), (Francisco Liébana-Cabanillas et al., 2018), (Francisco Liébana-Cabanillas et al., 2015)). For instance, (Kalinić et al., 2019) examined the moderating impact of gender on the acceptance of peer-to-peer mobile payment systems. A multi-group SEM analysis was used to test the moderating effect of gender by using survey data from 701 Spanish smartphone users. The study acknowledged significant differences between the two observed groups. It identified that men are more likely to use mobile payments than women and are consequently less impacted by the probable risks involved. Furthermore, men are more easily affected by their social environment, while women are more influenced by their innovativeness.

Another study (Francisco Liébana-Cabanillas et al., 2014) focuses on the moderating effect of experience on intention to use the SMS mobile payment tools on Virtual Social Networks. The proposed research model was built on modifying the classical technological acceptance models (TRA, TAM, and UTAUT) and tested with a survey of 2012 Spain mobile payment users through a quota sampling method. Using the SEM for data analysis, the finding showed that external influences, attitude, usefulness, and risk are determinants of intention to use mobile payment. It was highlighted that previous experience increases intention of use.

(Kalinic et al., 2019) aimed to analyze the individuals' usage intention of peer-to-peer (P2P) mobile payment. Using a two-stage approach (SEM and artificial neural network models) for data analysis, the research model is assessed with data collected through an online survey from a sample of 701 respondents in Spain. The findings showed that consumers perceive the usefulness of P2PM-pay as the most crucial factor affecting their decision to adopt this innovative technology. The significant impact of social norms and perceived trust are also corroborated. In comparing the findings of the SEM and the artificial neural network (ANN) analyses, the most significant difference is in the strength of the effect of the two variables, such as security and data protection. The ANN analysis increases the relative importance of perceived trust and perceived risk in the intention to use P2PM-pay.

Therefore, the author argued that a multi-analysis approach helps understand model variables' effects.

A study by (F. Liébana-Cabanillas & Lara-Rubio, 2017) explored the determinants of m-payment from the merchants' perspective using logistic regression and neural network analysis. Based on 151 Spanish merchants for the data set, these different analyses show that the neural network analysis is the most precise tool in this research when predicting the use of mobile payment systems in a particular business. The author argued that the probability of adopting mobile payment systems is higher in those companies which find considerable advantages in their adoption.

(Francisco Liébana-Cabanillas et al., 2018) focused on analyzing the individuals' intention to use NFC m-payment to determine which variables are the most relevant. To this end, the authors have conducted a study through an online survey of 191 Spanish users of smartphones. Extending the TAM model, the primary data analysis included a two-stage research methodology: SEM and neural network modeling. This study found that perceived usefulness and security were the most significant variables influencing the intention to use. The results of neural network analysis confirmed many SEM findings but also gave a slightly different order of influence of significant predictors.

(Francisco Liébana-Cabanillas et al., 2015) assessed users' acceptance of Quick response (QR) code mobile payment systems using convenient sampling of 168 participants from Spain and extending the TAM framework. The data were analyzed using SEM. It was found that attitude, innovation, and subjective norms are determinants of the future intention to use this technology.

Two articles (E. L. Slade et al., 2015), (E. Slade et al., 2015) focus on mobile payment in the United Kingdom. For example, (E. L. Slade et al., 2015) studied consumers' adoption intentions of remote mobile payments (RMP) in the United Kingdom by extending UTAUT with innovativeness, risk, and trust. Using survey data from 268 British m-payment respondents and performing SEM analysis, the following results were found: performance expectancy, social influence, innovativeness, and perceived risk significantly influenced nonusers' intentions to adopt RMP, while effort expectancy did not. The inclusion of mobile payment knowledge as a moderating variable showed a substantial difference in the effect of trust on the behavioral intention of those who knew about mobile payment than those who did not.

Another study by (E. Slade et al., 2015) explored consumer adoption of proximity mobile payments by extending the UTAUT2 model with trust and risk constructs. Using regression analysis with the data collected from 244 UK consumers, the result reveals that the extended model explains more variance in behavioral intention, but performance expectancy remains the strongest predictor across both models.

Two studies (Peng et al., 2012) and (Su et al., 2018) investigated mobile payment in China. For example,

(Peng et al., 2012) aimed to identify the factors determining tourists' acceptance of tourism m-payment through a survey of 421 tourists in China and tested against the extended TAM using the SEM approach. The empirical finding showed especially strong support for the impact of perceived security, perceived compatibility, destination m-payment knowledge, and tourist susceptibility to interpersonal influence.

(Su et al., 2018) investigated how users' Internet experience affects the adoption of mobile payment. The authors extended TAM and IDT (Innovation Diffusion Theory) while collecting survey data from 922 mobile users. They examined the mediating effect of five factors, i.e., perceived usefulness, perceived ease of use, compatibility, risk, and privacy concern, in the relationship between Internet experience and mobile payment adoption. It was found that the data of mobile users supported the partial mediating effects of the five factors.

Only one study regarding mobile payment was conducted in each of the following eleven countries ((Wei et al., 2021), (Wu et al., 2021), (Oliveira et al., 2016), (Verkijika, 2020), (Rafdinal & Senalasar, 2021), (Moorthy et al., 2020), (Koenig-Lewis et al., 2015), (Di Pietro et al., 2015), (Keramati et al., 2012), (Giovanis et al., 2021), (Hussain et al., 2019)). For example, (Wei et al., 2021) focused on the young generation's mobile payment adoption behavior by extending the UTAUT model with risk perception and bonus/rewards. To this end, 295 samples, with the majority being more tech-savvy, namely generation Y and generation Z in Taiwan, were collected from an online survey in Taiwan, while PLS-SEM and PROHIBIT models were used for data analysis. The empirical results demonstrated the positive effect of social influence on behavioral intention to adopt mobile payment. While behavioral intention and promotional activities are the drivers of the actual usage of mobile payment, perceived risks are found to exert a negative effect, reflecting the risk-averse preferences of the young generation in Taiwan. However, the moderation effect of gender revealed the absence of a gender gap in the use of mobile payment. The findings provide important implications for developing promotion programs motivating the young generation's mobile payment adoption.

(Wu et al., 2021) assessed the determinants of the intention to use cross-border mobile payments in Korea among Chinese Tourists. An Integrated Perspective of UTAUT2 with TTF and initial trust model, as well as task technology fit, were applied to 786 Chinese with the experience of using cross-border mobile payment while traveling to South Korea. With SEM analysis for data analysis, the following results were found: initial trust, performance expectancy, effort expectancy, facilitating conditions, price value, task technology fit, and initial trust significantly affect use intention.

Another study by (Oliveira et al., 2016) on mobile payment was conducted to understand the determinants

of customer adoption and intention to recommend the technology. The authors combined UTAUT2, DOI (diffusion of innovations), perceived security, and intention to recommend in order to build a research model. The model was empirically tested using a survey entailing 301 responses in Portugal and analyzed with the SEM. It was found that compatibility, performance, social influence, and innovativeness influence adoption and the intention to recommend this technology.

(Verkijika, 2020) aimed to provide an adequate response model for understanding the acceptance of mobile payment systems. In this regard, a model that focuses on understanding the role of emotions (affect, anticipated regret, and anxiety) in accepting mobile payment systems were built. The affective components in the model were adapted from the social-cognitive theory (SCT) and the regret theory. Using a sample of 325 survey responses from South Africa, the finding showed that affect and anticipated regret had a significant positive influence on behavioral intentions to adopt mobile payments, whereas the impact of anxiety was not significant.

A study by (Rafdinal & Senalasar, 2021) analyzed the adoption of mobile payment applications during the COVID-19 pandemic using the TAM and technology readiness index (TRI). Using collected data from 400 mobile payment users in Indonesia and PLS-SEM to analyze the relationship between variables, the finding revealed the following: TRI constructs affect perceived usefulness (PU) and perceived ease of use (PEOU), except for discomfort, which has no significant impact on the PU. Further, attitude is influenced by two foremost TAM constructs: PU and PEOU. Meanwhile, the intention to use mobile payment applications is influenced by attitude.

(Moorthy et al., 2020) studied the antecedents of behavioral intention to adopt mobile payment among working adults in Malaysia. The constructs of UTAUT2 with perceived security were adopted as a theoretical base. The collected data from 225 participants through a convenient sampling were tested using multiple linear regression (MLR) analysis. It was found that performance expectancy, facilitating conditions, hedonic motivation, and perceived security are significant in mobile payment adoption. However, effort expectancy and social influence are not significant. This result contributed to a simple UTAUT2 model with perceived security as an additional construct in explaining the adoption intention of mobile payment.

For example, using SEM for data analysis, (Koenig-Lewis et al., 2015) extended TAM and UTAUT by incorporating perceived enjoyment, social influence, knowledge, and perceived risk for understanding mobile payment adoption.

Replications of established theories are tested in a new context of young people's adoption of mobile payment in France. Using an online survey (N = 316), hypotheses were tested based on a comprehensive

theoretical framework. The comprehensive model improves earlier models by explaining 62% of the variation in intention to use. Against expectations, perceived ease of use had no significant influence on perceived usefulness and intention to use. The study contributes to advancing understanding of perceived enjoyment which had no direct effect on adoption intention but a significant effect on perceived ease of use and perceived usefulness. Social influence reduces perceived risk, and further contribution is made by noting that perceived enjoyment lowers perceived risk.

(Di Pietro et al., 2015) investigated the main predictors of the intention to use mobile payment acceptance with the application to public transport in Italy. The primary reference models, such as the TAM, DOI, and UTAUT, are extended to add new ones tailored to the mobile payment/ticketing framework. With the survey of 439 respondents, the theoretical framework was tested using the SEM. The findings revealed that perceived usefulness, perceived ease of use, and the security of the technology influenced the intention to use that technology. Moreover, the perceived usefulness is simultaneously impacted by perceived ease of use, compatibility with users' values and needs, and their attitude toward mobile services. Furthermore, the model confirms the direct relationship between the intention to use technology and its actual usage.

Another study conducted by (Keramati et al., 2012) investigated customers' adoption of mobile payment services in Iran. The proposed conceptual model integrated technological and behavioral factors of adopting mobile payment services. With a survey entailing 623 Iranian customers, ANOVA and MANOVA analyses were used to assess the effect of demographic and cultural characteristics on other related research factors. The overall fitness of the proposed model is tested by confirmatory factor analysis and logistic regression. The model revealed that ease of use, usefulness, trust, compatibility, cost, norm, payment habit, availability of mobile phone skills, and convenience are suitable, and these factors influence adoption superiorly.

(Giovanis et al., 2021) investigated the adoption of proximity mobile payment services (PMPS) using an extended version of the DTPB. Based on a two-stage hybrid analytic methodology (partial least squares (PLS) regression and artificial neural networks (ANN)), the proposed model was validated empirically using a sample of 951 participants in Greece. The PLS finding indicated that the extended DTPB provides a solid theoretical framework for studying the adoption of PMPS. The results of the PLS-ANN sensitivity analysis agree that interpersonal influence is a more significant factor than external influence, although there were some contradictions regarding the determination of customer attitudes and behavioral intentions toward PMPS usage.

(Hussain et al., 2019) aimed to examine m-payment adoption for the bottom of the pyramid (BoP) segment in a developing country context based on a sample size

of 247 BoP customers in Bangladesh. By performing confirmatory factor analysis and SEM, the study found that performance expectancy, effort expectancy, facilitating conditions, habit, and social influence significantly influence the BoP segment's behavioral intention. It is shown that performance expectancy, lifestyle compatibility, social influence, and habit have relatively more substantial effects and higher predictors of intentions.

Most studies on mobile payment during the past decades used quantitative research methods. The intention to adopt mobile payment was the most researched topic among the discussed studies. It was found that the adoption of mobile payments is influenced the most by attitude, social influence, perceived usefulness, and cognitive antecedents. Among the key factors affecting the non-adoption of mobile payment was lack of privacy and perceived risk. Future research should consider assessing how environmental factors such as social image and payment culture affect adoption. Moreover, moderating variables such as age, education, and experience will provide more insights for future research.

## Mobile banking

Mobile banking enables customers to perform various banking activities using their mobile devices. It is defined as the product or service provided by the financial industry using a mobile device, namely a mobile phone, smartphone, or tablet (Gbongli et al., 2016) (Shaikh & Karjaluoto, 2014).

Twenty-seven out of 61 studies investigated the adoption and use of mobile banking in countries such as Portugal, Pakistan, Indonesia, Mozambique, South Africa, Malaysia, China, Taiwan, Jordan, Brazil, the USA, Saudi Arabia, Ghana, the UK, and India.

Three studies explored mobile banking in Portugal ((Tam & Oliveira, 2016b), (Tam & Oliveira, 2016a), (Oliveira et al., 2014)). For instance, (Tam & Oliveira, 2016b) combined the DeLone & McLean IS success model and the Task Technology Fit (TTF) model to investigate the influence of m-banking on individual performance. Based on a survey questionnaire of 233 individuals in Oman, the data analysis was performed using SEM. The finding revealed that use and user satisfaction are important precedents of individual performance and the importance of moderating the impact of TTF over usage on individual performance. System quality, information quality, and service quality positively affect user satisfaction.

Another study by (Tam & Oliveira, 2016a) investigated the determinants of mobile banking for individual performance and checked whether or not there are any age or gender differences. To address this concern, a research model was built based on the task-technology fit theory to integrate task and technology characteristics, technology usage, and individual performance while relating the age and gender subsamples.

The primary data (a survey of 256 individuals in Portugal) were analyzed using PLS-SEM. The findings revealed that TTF and usage are essential precedents of individual performance. The authors found statistically significant differences in path usage to performance impact for the age subsample and no statistically significant differences for the gender subsample.

Another study by (Oliveira et al., 2014) synergistically combined the strengths of three IS theories: the task technology fit model, the unified theory of acceptance and usage of technology, and the initial trust model for understanding mobile banking adoption. The model was tested in a study conducted in Portugal. Based on the sample of 194 individuals, partial least squares were performed to test the conceptual model proposed. It was found that facilitating conditions and behavioral intentions directly influence m-banking adoption. Initial trust, performance expectancy, technology characteristics, and task technology fit affect behavioral intention.

Three studies focused on mobile banking in Taiwan ((Lin, 2011), (Yu, 2012), (Lu et al., 2015)). For example, (Lin, 2011) investigated mobile banking adoption in Taiwan based on innovation diffusion theory and knowledge-based trust literature. Using a survey of 368 participants, both potential customers and repeat customers, the research model was analyzed with SEM. The results indicated that perceived relative advantage, ease of use, compatibility, competence, and integrity significantly impact attitude, leading to behavioral intention to adopt (or continue to use) mobile banking. Additionally, based on a multi-group analysis with *t*-statistics, it was found that the antecedents of attitude toward mobile banking differ between potential and repeat customers.

Another study (Yu, 2012) employed UTAUT and PLS regression for model analysis to investigate what influences people to adopt mobile banking. Through convenient sampling of 441 respondents in Taiwan, the study empirically concluded that individual intention to adopt mobile banking was significantly impacted by social influence, perceived financial cost, performance expectancy, and perceived credibility in their order of influencing strength. The behavior was considerably affected by individual intention and facilitating conditions. It was further found that gender significantly moderated the effects of performance expectancy and perceived financial cost on behavioral intention, and age significantly moderated the effects of facilitating conditions and perceived self-efficacy on actual adoption behavior.

Very few studies use a technique other than SEM. For instance, (Lu et al., 2015) adopted a multiple attribute decision-making (MADM) model by combining decision-making trial and evaluation laboratory (DEMATEL) with map (INRM), DANP (DEMATEL-based ANP), and the VIKOR method. A conceptual model was developed to explore the users'

behavioral intention to adopt mobile banking services in the financial banking industry in Taiwan through DTPB and trust-related behaviors using the knowledge of experts. The study found the following results. Technology-facilitating conditions were the most significant criterion when evaluating mobile banking services in the financial banking industry. It also revealed that information integration and mobile banking services for user behavior intention structure are the most critical information integration areas in mobile banking services development.

Similarly, three studies (Alalwan et al., 2017), (Alalwan et al., 2016), (Al Khasawneh, 2015) investigated mobile banking adoption in Jordan. For example, (Alalwan et al., 2017) investigated the factors affecting behavioral intention and mobile banking adoption by Jordanian banks' customers. With an extended UTAUT2 model and trust, 343 participants were obtained as data was collected through a convenient sampling while employing SEM for analysis. It was mainly found that behavioral intention is significantly and positively influenced by performance expectancy, effort expectancy, hedonic motivation, price value, and trust.

(Alalwan et al., 2016) proposed and examined a conceptual model based on TAM that best explains the key factors influencing Jordanian customers' intention to adopt mobile banking by adding perceived risk and self-efficacy as external factors. The model was tested using SEM with convenient sampling data from 330 Jordanian. The study showed that behavioral intention is significantly influenced by perceived usefulness, perceived ease of use, and perceived risk.

(Al Khasawneh, 2015) conducted a study to empirically examine consumer adoption of mobile banking in Jordan based on a convenient sampling of 268 respondents. The data was performed using SEM by incorporating TAM with constructs including perceived trust, perceived credibility, and consumers' attitudes and intention to use m-banking. The finding revealed that perceived ease of use, perceived usefulness, perceived credibility, and perceived trust significantly positively influence attitude, which positively affects the intention to adopt mobile banking.

Two studies (Raza et al., 2019), (Farah et al., 2018) highlighted the understanding of mobile banking adoption in Pakistan. For example, (Raza et al., 2019) examined the factors impacting mobile banking acceptance in Islamic banks in Pakistan by using the UTAUT model. With collected data from 229 respondents through convenient sampling, the model was analyzed using confirmatory factor analysis and PLS-SEM. The performance expectancy, facilitating conditions, social influence, effort expectancy, perceived value, habit, and hedonic motivation were taken as independent variables. Behavioral intention was taken as the mediator, and actual usage was used as the dependent variable. The empirical evidence stressed

that all the variables except for social influence have a significant positive impact on the intention, which leads to actual usage.

Another study by (Farah et al., 2018) studied the critical factors explaining consumer intention and use behavior in mobile banking adoption. Extending UTAUT2 with Non-monetary, Trust, and perceived risk constructs, a convenience sampling technique was used to collect data from 490 respondents in Pakistan. Using SEM for data analysis, the study identified that most of the predictors of intention, such as perceived value, performance expectancy, habit, social influence, effort expectancy, hedonic motivation (except for facilitating condition), perceived risk, and trust, are significant. All predictors of usage behavior are significant.

Two studies used the data collected in Saudi Arabia ((Al-Jabri & Sohail, 2012), (Baabdullah et al., 2019)). For example, (Al-Jabri & Sohail, 2012) examined factors affecting the adoption of mobile banking in Saudi Arabia. Based on the regression analysis of 330 responses from actual banking users, it was found that relative advantage, compatibility, observability, and perceived risk significantly affect the intention to adopt mobile banking. Trialability and complexity were not found to have a significant effect on adoption. It was found that the proposed model explains 42.8 % of mobile banking adoption based on the Diffusion of Innovation theory.

A study conducted by (Baabdullah et al., 2019) identified and examined the most important factors that could predict Saudi customer's continued intention to adopt mobile banking. The proposed conceptual model was built on the TAM and task-technology fit (TTF) model by integrating perceived privacy and security. By using the data of 320 respondents from a convenience sample of Saudi banking customers, the study adopted the SEM technique for data analysis. It was found that the main results supported the impact of perceived privacy, perceived security, perceived usefulness, and task-technology fit on the customers' continued intention to use mobile banking.

While most studies investigated mobile banking adoption in a single country (although the countries studied in the corresponding case are diverse), some studies (Changchit et al., 2020), (Frimpong et al., 2020)) compared it between developed and developing countries. For example, (Changchit et al., 2020) compared mobile banking perceptions among consumers in the U.S. (355 respondents) and in Thailand (400 respondents) using factor analysis and statistical t-tests data analysis. The result found a significant difference in subjects' attitudes toward mobile banking between these two nationalities. On average, the U.S. subjects' attitudes toward mobile banking are significantly higher than Thai subjects.

(Frimpong et al., 2020) focused on a cross-national investigation of trait antecedents of mobile-banking adoption between the UK and Ghana. Based on insights from innovation adoption and personality research, this study tested a model of mobile-banking adoption using

data from a developed and a developing country. Based on convenient and purposive sampling, survey data from 1,340 participants from the United Kingdom and Ghana were used for PLS-SEM analysis. The results indicated that intrinsic traits are more substantial in explaining consumers' attitudes toward mobile banking in Ghana than in the United Kingdom. However, no significant variance between the two countries was observed concerning the mediation effect of consumers' attitudes on the intention to use mobile banking.

Except for the cross-national study, the following eleven countries recorded only a single-country study related to mobile banking. For example, (Sharma, 2019) identified vital antecedents impacting mobile banking acceptance in Oman. The research extends the original TAM by incorporating two cognitive antecedents, i.e., autonomous motivation and controlled motivation, together with trust components for understanding adoption. Data were collected from 225 mobile banking users in Oman and analyzed using an SEM-artificial neural network. It was found that trust and autonomous motivation are the two main predictors influencing mobile banking acceptance.

Another study conducted in Indonesian by (Suhartanto et al., 2019) examined mobile banking adoption in Islamic banks by integrating TAM and Religiosity-Behavioral Intention Model. With a sample size of 300 mobile banking customers of Islamic banks from Indonesia, PLS-SEM was applied to assess the association between perceived usefulness, perceived ease of use, religiosity, satisfaction, and adoption. The finding disclosed that integrating TAM and the Religiosity-Intention model explains Islamic bank consumers' adoption of mobile banking. Besides perceived usefulness and perceived ease of use, the results of this study emphasize the importance of religiosity in mobile banking adoption.

The study by (Gonçalo Baptista & Oliveira, 2015) in Mozambique proposed an innovative and comprehensive theoretical model combining UTAUT2 with cultural moderators to offer new insights into factors affecting acceptance and how culture influences individual use behavior. The model was tested using PLS-SEM in a quantitative study conducted with a 252 sample size. Performance expectancy, hedonic motivation, and habit were the most significant antecedents of behavioral intention. To explain mobile banking use behavior, the most important drivers were the effect of habit and culture on intention over use behavior. Collectivism, uncertainty avoidance, short-term, and power distance were the most significant cultural moderators.

(Thusi & Maduku, 2020) aimed to analyze the determinants of mobile banking app acceptance and use from a sample of 352 millennial retail banking customers in South Africa through convenient sampling. A multi-perspective framework is used based on UTAUT2, multi-dimensional institution-based trust, and risk. The findings suggested that performance expectancy, facilitating conditions, habit, perceived

risk, and institution-based trust are significantly associated with adopting mobile banking apps and that facilitating conditions, perceived risk, and behavioral intention directly influence mobile banking app behavior.

A study (Goh & Sun, 2014) used a modified TAM with 105 participants from Malaysia to examine how gender differences influence the adoption of Islamic mobile banking. Using a PLS-SEM, this study revealed two different and remarkable models that impact the acceptance of Islamic mobile banking. Male Muslims desire status and value orientations; therefore, perceived self-expressiveness significantly affects their acceptance of Islamic mobile banking. On the other hand, female Muslims prefer social and utilitarian orientations; thus, their acceptance of Islamic mobile banking was significantly influenced by perceived usefulness and social norms. The author argued that the finding should be interpreted as speculative and should not be relied upon to depict behavior in the surveyed communities accurately.

One study (Zhou, 2012) focused on China by examining mobile banking user adoption from trust and flow experience perspectives. With 200 respondents through random sampling, the collected were conducted employing SEM. The finding indicated that structural assurance is the main factor affecting trust, whereas ubiquity and perceived ease of use are the main factors influencing flow experience. Trust significantly affects flow experience, and both factors determine usage intention, affecting actual usage.

(Giovanis et al., 2019) investigated which of four well-established theoretical models (i.e., TAM, theory of planned behavior, UTAUT, decomposed theory of planned behavior (DTPB)) best explains potential users' behavioral intentions to adopt mobile banking services. Based on the convenient sampling of 931 potential users in Greece, the data were performed using SEM. The result of the study revealed that the best model is an extension of the DTPB with perceived risk. Customers' attitude, determined by three rationally-evaluated MB attributes (usefulness, easiness, and compatibility), is the primary driver of consumers' intentions to adopt m-banking services. Perceived risk negatively affects attitude formation and inhibits willingness to use m-banking services.

One study conducted by (Goncalo Baptista & Oliveira, 2017) in Brazil identified the potential impact of using game mechanics and game design techniques in accepting mobile banking services. The theoretical model based on UTAUT was tested in a quantitative study using SEM with 326 entailing actual local banking customers in Brazil. The findings showed a direct and strong relationship between gamification and intention to use mobile banking services. This supports that gamification can help make banking activities more exciting, engaging, and enjoyable when used and

designed appropriately, increasing customer acceptance, engagement, and satisfaction.

For instance, (Changchit et al., 2017) examined the determinants of attitudes toward using and accepting mobile banking in the USA. With a convenient sampling, a total of 309 students enrolled at a southwestern United States university participated in this study using multiple regression techniques for data analysis. Besides perceived usefulness and perceived ease of use included in the original TAM model, the modified model involved five additional factors (perceived privacy, perceived security, previous experiences, normative beliefs, and technology competency) as determinants of attitude toward the usage of mobile banking. It was found that perceived usefulness, perceived ease of use, perceived security, and previous experiences were key determinants for whether subjects intend to use mobile banking.

One study (Owusu Kwateng et al., 2019) examined factors influencing customers to adopt and subsequently use m-banking services in Ghana using the UTAUT2 model with age, educational level, user experience, and gender as moderators. With a purposive sampling of 300 users of m-banking services in Ghana, the primary data collected were analyzed using PLS-SEM. Findings indicated that habit, price value, and trust are the main factors influencing the adoption and use of m-banking in Ghana. Individual differences in gender, age, educational level, and user experience responded in a different way as they moderate the relationship between UTAUT2 constructs and use behavior.

(Gupta & Arora, 2017) investigated the adoption of mobile banking among Indian consumers using the framework of behavioral reasoning theory (BRT) to hypothesize relationships between values, reasoning constructs, attitudes, and intentions. With the collected data from 379 Indian banking consumers, confirmatory factor analysis and SEM were used to analyze the data. It was found that "reasons for" and "reasons against" impact m-banking adoption. Regarding the "reasons for" m-banking adoption, ubiquitous was the primary determinant, and among the "reasons against" m-banking adoption, the tradition barrier was the primary determinant. The findings also confirmed that the value of "openness to change" significantly influences reasons for adoption and has no impact on reasons against and attitudes toward m-banking.

The studies on mobile banking mainly focused on antecedents of acceptance and use of mobile banking and customer attitude. Although the above studies offered valuable insights into the mobile banking industry using theories such as TAM, UTAUT2, and DTPB models, they have some limitations that provide future research directions. First, no qualitative study was performed by the researchers of this literature review. Indeed, all the surveys were conducted 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 to understand consumer behavior regarding mobile banking better. Second, most studies adopted convenience sampling techniques, limiting the generalizability for the entire population. Therefore, it is suggested that future research study different demographic groups within the target population (Farrokhi & Mahmoudi-Hamidabad, 2012). Third, most studies focus on a single country or even a city, and few comparative studies have been conducted in this literature review. Indeed, out of 26 studies regarding banking adoption, only two studies have recently opted for cross-national research such as (Changchit et al., 2020) conducted a study between the United States and Thailand, while (Frimpong et al., 2020) opted for UK and Ghana. This kind of work would allow us to measure the impact of cultural factors on mobile banking adoption.

### Mobile wallet

Mobile wallet refers to remote payment technologies which need to be installed in the smartphone to allow the consumer to store his money and perform transactions directly from the wallet (Madan & Yadav, 2016). Interestingly, only two studies out of 61 focused on mobile wallets, and they were conducted in India (Chawla & Joshi, 2021), (N. Singh et al., 2020). For example, (Chawla & Joshi, 2021) aimed to enhance the performance of attitudes toward mobile wallet adoption among Indian consumer segments. Integrating TAM and UTAUT, a nationwide survey was conducted to obtain 744 responses based on convenience sampling. Primary analyses were performed using one-way Analysis of Variance (ANOVA) and Importance-Performance Map Analysis (IPMA). The finding regarding each cluster indicated that the top three critical constructs are perceived usefulness, security, and lifestyle compatibility, as indicated by the IPMA.

A study (N. Singh et al., 2020) explored factors influencing users' recommendations to use m-wallet in India. Combining the TAM and UTAUT2 to develop the study model included 206 responses in India and SEM technique for data analysis. It was found that ease of use, usefulness, perceived risk, and attitude significantly affect the user's intention, which further influenced the users perceived satisfaction and recommendation to use mobile wallet services. The study also determined the moderating effect of stress and social influence on user satisfaction and recommendation.

Research on mobile wallets focused on factors affecting adoption and customer satisfaction. The following limitations can be underlined based on the above overview of the studies. First, the studies did not test for the effect of age, gender, and education as potential factors affecting mobile wallet adoption. Future research should include these variables in their proposed models. Second, because the two studies focused on India, thus data were collected from respondents living in India. From this perspective,

studying mobile wallets at the cross-national level can provide additional insight into mobile wallet adoption and satisfaction.

### Mobile Money

Mobile money is a digital payment platform that transfers money between cellphone devices. (Alhassan et al., 2020) investigated consumer acceptance and continuance of mobile money in Africa using secondary data with the TAM model and employed SEM for data analysis. The research model tests the context-based constructs to determine how these constructs affect peoples' intentions and attitudes toward the continued use of mobile money. The empirical results suggested that the availability of electricity remains an essential factor for mobile phone functionality and continuing use of mobile money in the long run. It also found a correlation between regulations that are perceived to be enabling and the intentions of individuals to continue using mobile money. However, there is a negative correlation between rural dwellings and individuals' intentions to use mobile money.

(Okello Candiya Bongomin & Ntayi, 2019) aimed to establish the mediating effect of trust in the relationship between mobile money adoption and usage and financial inclusion, focusing on rural Uganda. A quantitative survey based on 379 micro, small and medium enterprises (MSMEs) located in northern Uganda was analyzed using PLS-SEM. The authors found evidence that trust increases mobile money adoption and usage to raise the scope of financial inclusion of MSMEs in developing countries. Moreover, when the individual effect was determined, trust also had a significant and positive effect on financial inclusion.

The studies on mobile money generally focused on enablers and the inhibitors of mobile money adoption and customer satisfaction. Based on the above overview of the studies, the following limitations can be underlined. The studies did not test for the effect of age, gender, and education as possible elements impacting mobile money adoption. Future studies are encouraged to include these variables in their proposed models.

### *What are the analytical techniques that underpin the studies of MFS?*

The majority of studies (47 articles or 77.04%) on mobile financial services used structural equation modeling (SEM) and partial least square (PLS) as the main tools of analysis. For the last two decades, SEM has become the most commonly employed technique for many scholars investigating complex relationships between latent constructs (Astrachan et al., 2014). However, with the increasingly challenging requirements of covariance-based SEM (CB-SEM) in



terms of distribution assumptions, sample size, and model complexity (Astrachan et al., 2014) (Hair et al., 2014), the use of the partial least squares SEM (PLS-SEM), a less restrictive method, is enjoying widespread popularity and success with academicians (Souiden et al., 2019). PLS-SEM applications have grown exponentially in the past decade (Leguina, 2015), especially in the social sciences (e.g., (Ali et al., 2018) (Ringle et al., 2020)), and its use is expanding in marketing (Kumar et al., 2020) (Buzeta et al., 2020) (Gbongli et al., 2019) and information system research (Chin et al., 2020). Artificial neural network analyses were conducted in five studies (8.19%), and regression or multiple regression analyses were used in four articles (6.55%). In contrast, a few studies used other techniques such as MADM (multiple attribute decision-making), k-means clustering, ANOVA (analysis of variance), MANOVA (multivariate analysis of variance), t-tests, and IPMA (importance-performance map analysis). It is essential to mention that the cross-sectional data design is the most used approach. Longitudinal and panel designs are nonexistent, signifying the potential difficulties of these methods to be carried out in the marketing discipline in general and in the financial sector. As for the qualitative approach, none of the studies were found using it.

### *What is the theoretical basis that supports the studies of MFS?*

Earlier studies examining consumers' adoption of mobile financial services often rely on well-established models to explain consumers' behavior or behavioral intention. Among these models, the unified theory of acceptance and usage of technology (UTAUT/UTAUT2) was one of the main theoretical frameworks in 25 articles (40.98%), followed by the technology acceptance model (TAM) used in 23 studies (37.70%). The remaining are the task technology fit model (TTF) adopted by 5 studies (8.19%), the theory of planned behavior (TPB)/the decomposed theory of planned behavior (DTPB) adopted in 5 studies (8.19%), and the innovation diffusion theory (IDT)/diffusion of innovation (DOI) considered by 4 articles (6.55%). Additionally, other behavioral models were considered either solely or combined with the innovation adoption models to explain consumers' adoption of mobile financial services. Among these models, we can indicate the theory of reasoned actions (TRA), the initial trust model (ITM), the expectation confirmation theory (ECT), the IT continuance model of Information systems success (ISS), the model of transaction cost economics (TCE) theory, the social-cognitive theory (SCT), and the regret theory.

### *Factors affecting behavioral intention of mobile financial services*

The factors affecting behavioral intention to adopt mobile financial services can be viewed in Table 6 as considering the total of significant columns. For example, the most studied variable was performance expectancy (14 times, i.e., 22.95%) (Oliveira et al., 2014), (Raza et al., 2019), (Moorthy et al., 2020). It is followed by social Influence (21.31%) (Khalilzadeh et al., 2017), (Farah et al., 2018), (Hussain et al., 2019), (Koenig-Lewis et al., 2015), attitude (14.75%) (Francisco Liébana-Cabanillas et al., 2015) and along with others. Additionally, just a few studies found a significant impact of task technology fit (Wu et al., 2021), initial trust (Wu et al., 2021), gamification impact (Goncalo Baptista & Oliveira, 2017), and perceived enjoyment (Kalinic et al., 2019) on behavioral intention.

## WEIGHT ANALYSIS

This study uses the vote-counting method (M. Rhaïem, 2017), which reports the number of times a concept is used and the number of times it is statistically significant to demonstrate its relevance. In particular, the study focus on weight analysis, which examines the strength of a predictor (independent variable) on the outcome (dependent variable). This analysis enables for investigation of the predictive power of an independent variable in a studied relationship (Jeyaraj et al., 2006). Table 6 briefly describes the 33 most frequently used relationships towards behavioral intention to use mobile financial services. This involves the number of significant and non-significant relationships, the number of relationships examined by earlier research between each pair of dependent and independent variables, and the weight calculated for each of these relationships. Therefore, most studies used behavioral intention as a dependent variable (33 times). To perform weight analysis, the number of significant relationships was divided by the total number of analyzed relationships between an independent and dependent variable (Ismagilova et al., 2020). The weight 1 (one) indicates that the relationship between the two constructs is significant in all studies, whereas 0 (zero) indicates the opposite, that it is non-significant across all (Jeyaraj et al., 2006). For example, the weight for the relationship between performance expectancy and behavioral intention is calculated by dividing 14 (the number of significant relationships) by 16 (the total number of relationships), which equals 0.875. According to (Jeyaraj et al., 2006), predictors can be categorized into "well utilized" (studied more than 5 times) and experimental (examined less than 5 times). A well-utilized predictor is regarded as the best predictor if its weight equals more than 0.8. A predictor is viewed as

promising if examined less than five times (experimental), and its weight equals 1.

Following the weight analysis, it was found that well-utilized predictors for behavioral intention are social influence (examined 19 times), performance expectancy (examined 16 times), effort expectancy (examined 14 times), facilitating condition (examined 9 times), hedonic motivation (examined 12 times), habit (examined 8 times), perceived risk (examined 7 times), trust (examined 6 times), perceived ease of use (examined 8 times), perceived security (examined 5 times), perceived usefulness (examined 6 times), social norms (examined 7 times), and attitude (examined 9 times). Out of these well-utilized predictors, six predictors, namely attitude (weight equals 1), perceived ease of use (weight equals 1), performance expectancy

(weight equals 0.875), habit (weight equals 0.875), social norms (weights equals 0.857), and perceived usefulness (weight equals to 0.833), are considered as the best predictors of behavioral intention.

There are 18 predictors of behavioral intention, which are experimental: Perceived Value (examined 4 times), Price Value (examined 4 times), Trust (examined 4 times), to mention few. Out of 18 experimental predictors, except trust, seventeen are considered promising with a weight of 1. Social Influence, Hedonic Motivation, Effort Expectancy, facilitating condition, and perceived risk, are considered the least effective predictors of behavioral intention, as they were examined more than five times with a weight less than 0.8.

*Table. 6*  
*Result of weight analysis*

Independent Variable	Dependent Variable	Total of significant	Total of non-significant	Total number of test	weight
Performance Expectancy	Behavioral Intention	14	2	16	0.875
Social Influence		13	6	19	0.684
Attitude		9	0	9	1
Hedonic Motivation		8	4	12	0.667
Perceived Ease-of-Use		8	0	8	1
Habit		7	1	8	0.875
Effort Expectancy		6	8	14	0.429
Subjective Norms		6	1	7	0.857
Facilitating conditions		5	4	9	0.556
Perceived Risk		5	2	7	0.714
Perceived security		5	0	5	1
Perceived Usefulness		5	1	6	0.833
Perceived Value		4	0	4	1
Price Value		4	0	4	1
Trust		4	2	6	0.667
Innovativeness		2	0	2	1
Relative advantage		2	0	2	1
Perceived financial cost		2	0	2	1
Perceived credibility		2	0	2	1
Perceived behavioural Control		2	0	2	1
Personal Innovativeness		2	0	2	1
Usage Intention		1	0	1	1
Task Technology Fit		1	0	1	1
Initial Trust		1	0	1	1
Visibility		1	0	1	1
Institution-based trust		1	0	1	1
Lifestyle compatibility		1	0	1	1

External influences		1	0	1	1
Gamification impact		1	0	1	1
Knowledge		1	0	1	1
Perceived self-expressiveness		0	1	1	0
Perceived Enjoyment		0	1	1	0
Individual Mobility		0	1	1	0

Source: own calculations

## THE CRITICAL TECHNOLOGICAL DRIVERS OF MOBILE FINANCIAL SERVICES

### *The Technological – Personal – Environmental (TPE) framework mapping*

Table 7 presents the 38 drivers (factors) influencing humans using mobile financial services (MFS). The ten (10) most studied drivers of MFS are perceived usefulness, perceived ease of use, facilitating condition, social influence, performance expectancy, effort expectancy, attitude, trust, habit, and social norms. Based on Table 7 (i.e., the column of number (No)), Figure 1 displays the mapping of the Technological – Personal – Environment framework, which entails 38 factors mapping to the three significant area variables. Added areas represent the various intersection between technological – personal, technological – environment, personal – environment, and all of the variables (see Figure 1). The numbers used in Figure 1 refer to the list of factors in column number (No) in Table 7 (e.g., 1 is perceived usefulness, 2 is perceived ease of use). Researchers adopt no fewer than 21 factors to assess mobile digital financial services. The critical technological factors of mobile financial services

adoption proposed as one of the objectives for the research can be deduced from Figure 1.

As such, the personal factor is the prevalent factor supporting mobile financial services' existence. In addition to personal factors, the second most significant factor is technological, with as many as six factors. Even there are 5 factors included in the technological-personal area. The small factor that researchers employed is the environmental factors. This is because the environmental factors are located at the research site, so they cannot generally be changed. Three environmental factors are structural assurances, rural dwellings, and social influence. The situation can be of concern for the development of technology, especially mobile financial services when considering the factors found in the technological factor, namely 6 factors: facilitating condition, Perceived Security, Technology Characteristics, Task technology, Perceived credibility, and Firm reputation. Apart from these 6 factors, there are factors that, together with personal factors, are 7: compatibility, value, services, accessibility, system quality, agreement, and usability. In addition, there are 2 factors related to technological, personal, and environmental factors are considered in the development of technology: structural assurances and knowledge. These 13 factors are, therefore, very beneficial for technological development, particularly in mobile digital financial services when developing and improving the services.

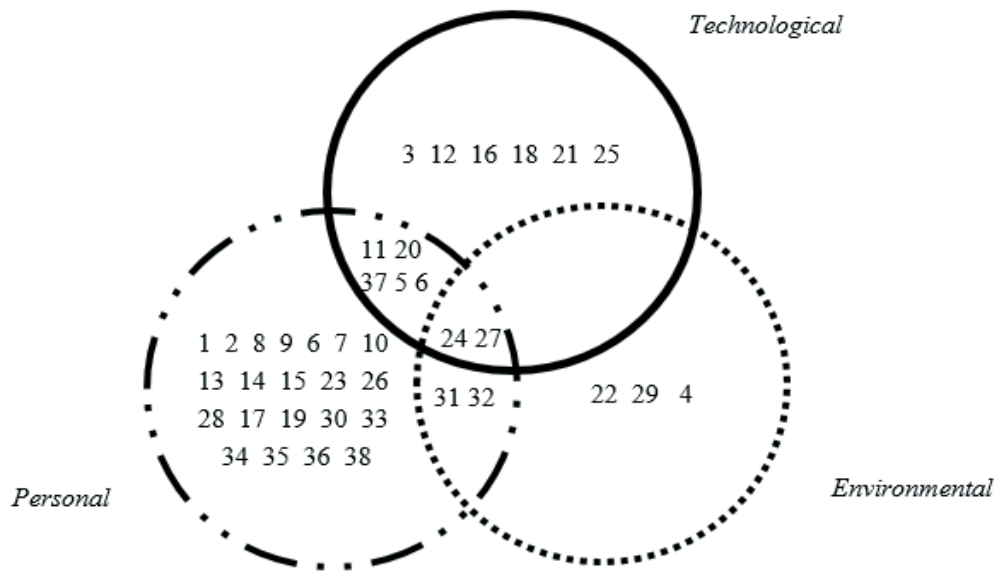
Table 7  
Occurrences of mobile financial services factors

No.	Considered variables as drivers of MFS adoption	Frequency	Reference
1	Perceived Usefulness	24	(Alhassan et al., 2020), (Sharma, 2019), (Bailey et al., 2017), (Suhartanto et al., 2019), (Yen & Wu, 2016), (Goh & Sun, 2014), (Giovanis et al., 2021), (Giovanis et al., 2019), (Baabdullah et al., 2019), (Kalinić et al., 2019), (Rafdinal & Senalasar, 2021), (Purohit & Arora, 2021), (N. Singh et al., 2020), (Francisco Liébana-Cabanillas et al., 2014), (Alalwan et al., 2016), (Al Khasawneh, 2015), (Kalinic et al., 2019), (Talwar et al., 2020), (Peng et al., 2012), (Zhang & Mao, 2020), (Koenig-Lewis et al., 2015),

			(Francisco Liébana-Cabanillas et al., 2018), (Francisco Liébana-Cabanillas et al., 2015),(Di Pietro et al., 2015)
2	Perceived Ease of-use	23	(Alhassan et al., 2020), (Sharma, 2019), (Bailey et al., 2017), (Suhartanto et al., 2019), (Yen & Wu, 2016), (Johnson et al., 2018), (Giovanis et al., 2021), (Zhou, 2012), (Giovanis et al., 2019), (Baabdullah et al., 2019), (Kalinić et al., 2019), (Purohit & Arora, 2021), (N. Singh et al., 2020), (Lin, 2011), (Francisco Liébana-Cabanillas et al., 2014), (Alalwan et al., 2016), (Al Khasawneh, 2015), (Peng et al., 2012), (Zhang & Mao, 2020), (Koenig-Lewis et al., 2015), (Francisco Liébana-Cabanillas et al., 2018), (Francisco Liébana-Cabanillas et al., 2015), (Di Pietro et al., 2015))
3	Facilitating Conditions	20	(Khalilzadeh et al., 2017), (Oliveira et al., 2014), (Patil et al., 2020), (Jadil et al., 2021), (Raza et al., 2019), (Wei et al., 2021), (Wu et al., 2021), (Oliveira et al., 2016), (Gonçalo Baptista & Oliveira, 2015), (Thusi & Maduku, 2020), (Giovanis et al., 2021), (Giovanis et al., 2019), (Farah et al., 2018), (Hussain et al., 2019), (Moorthy et al., 2020), (Alalwan et al., 2017), (Goncalo Baptista & Oliveira, 2017), (Yu, 2012), (Owusu Kwateng et al., 2019), (E. Slade et al., 2015)
4	Social Influence	20	(Khalilzadeh et al., 2017), (Oliveira et al., 2014), (Patil et al., 2020), (Jadil et al., 2021), (Raza et al., 2019), (Wei et al., 2021), (Wu et al., 2021), (E. L. Slade et al., 2015), (Oliveira et al., 2016), (Gonçalo Baptista & Oliveira, 2015), (Thusi & Maduku, 2020), (Farah et al., 2018), (Hussain et al., 2019), (Moorthy et al., 2020), (Alalwan et al., 2017), (Goncalo Baptista & Oliveira, 2017), (Yu, 2012), (Owusu Kwateng et al., 2019), (E. Slade et al., 2015), (Koenig-Lewis et al., 2015)
5	Performance expectancy	19	(S. Singh, 2020), (Alhassan et al., 2020), (Oliveira et al., 2014), (Patil et al., 2020), (Raza et al., 2019), (Wei et al., 2021), (Wu et al., 2021), (E. L. Slade et al., 2015), (Oliveira et al., 2016), (Gonçalo Baptista & Oliveira, 2015), (Thusi & Maduku, 2020), (Farah et al., 2018), (Hussain et al., 2019), (Moorthy et al., 2020), (Alalwan et al., 2017), (Goncalo Baptista & Oliveira, 2017), (Owusu Kwateng et al., 2019), (E. Slade et al., 2015),(Zhang & Mao, 2020)
6	Effort expectancy	18	(Khalilzadeh et al., 2017), (Oliveira et al., 2014), (Patil et al., 2020), (Jadil et al., 2021), (Raza et al., 2019), (Wei et al., 2021), (Wu et al., 2021), (E. L. Slade et al., 2015), (Oliveira et al., 2016), (Gonçalo Baptista & Oliveira, 2015), (Thusi & Maduku, 2020), (Farah et al., 2018), (Hussain et al., 2019), (Moorthy et al., 2020), (Alalwan et al., 2017), (Goncalo Baptista & Oliveira, 2017), (Owusu Kwateng et al., 2019), (E. Slade et al., 2015)
7	Attitude	16	(Alhassan et al., 2020), (Patil et al., 2020), (Bailey et al., 2017), (Giovanis et al., 2021), (Giovanis et al., 2019), (Gupta & Arora, 2017), (Rafdinal & Senalasar, 2021), (Purohit & Arora, 2021), (N. Singh et al., 2020), (Lin, 2011), (Francisco Liébana-Cabanillas et al., 2014), (Al Khasawneh, 2015), (Changchit et al., 2017), (Zhang & Mao, 2020), (Francisco Liébana-Cabanillas et al., 2015), (Di Pietro et al., 2015)
8	Trust	14	(S. Singh, 2020), (Khalilzadeh et al., 2017), (Sharma, 2019), (Patil et al., 2020), (E. L. Slade et al., 2015), (Zhou, 2012), (Farah et al., 2018), (Kalinić et al., 2019), (Alalwan et al., 2017), (Francisco Liébana-Cabanillas et al., 2014), (Owusu Kwateng et al., 2019), (Al Khasawneh, 2015), (Kalinić et al., 2019), (E. Slade et al., 2015)
9	Habit	10	(Raza et al., 2019), (Wu et al., 2021), (Yen & Wu, 2016), (Gonçalo Baptista & Oliveira, 2015), (Thusi & Maduku, 2020), (Farah et al., 2018), (Hussain et al., 2019), (Goncalo Baptista & Oliveira, 2017), (Owusu Kwateng et al., 2019), (E. Slade et al., 2015)
10	Subjective Norms	10	(Goh & Sun, 2014), (Verkijika, 2020), (Kalinić et al., 2019), (Purohit & Arora, 2021), (Moorthy et al., 2020), (Lin, 2011), (Kalinić et al., 2019), (Zhang & Mao, 2020), (Francisco Liébana-Cabanillas et al., 2018), (Francisco Liébana-Cabanillas et al., 2015)
11	Price Value	4	(Wu et al., 2021), (Oliveira et al., 2016), (Gonçalo Baptista & Oliveira, 2015), (Hussain et al., 2019), (Alalwan et al., 2017), (Goncalo Baptista & Oliveira, 2017), (Owusu Kwateng et al., 2019), (E. Slade et al., 2015)

12	Perceived Security	7	(S. Singh, 2020), (Johnson et al., 2018), (Moorthy et al., 2020), (Changchit et al., 2017), (Peng et al., 2012), (Francisco Liébana-Cabanillas et al., 2018), (Francisco Liébana-Cabanillas et al., 2015)
13	Satisfaction	6	(S. Singh, 2020), (Tam & Oliveira, 2016b), (Suhartanto et al., 2019), (N. Singh et al., 2020), (Al-Jabri & Sohail, 2012), (Kalinic et al., 2019)
14	Self-efficacy	6	(Bailey et al., 2017), (Verkijika, 2020), (Giovanis et al., 2021), (Giovanis et al., 2019), (Yu, 2012), (Alalwan et al., 2016)
15	Personal Innovativeness	6	(Patil et al., 2020), (Zhou, 2012), (Kalinić et al., 2019), (Kalinic et al., 2019), (Francisco Liébana-Cabanillas et al., 2018), (Francisco Liébana-Cabanillas et al., 2015)
16	Technology Characteristics	4	(Tam & Oliveira, 2016b), (Oliveira et al., 2014), (Wu et al., 2021), (Baabdullah et al., 2019)
17	Relative Advantage	4	(Johnson et al., 2018), (Lin, 2011), (Al-Jabri & Sohail, 2012), (Zhang & Mao, 2020)
18	Task Technology	3	(Tam & Oliveira, 2016b), (Oliveira et al., 2014), (Wu et al., 2021)
19	Anxiety	3	(Patil et al., 2020), (Bailey et al., 2017), (Verkijika, 2020))
20	Risk	3	(Khalilzadeh et al., 2017), (Wei et al., 2021), (Gupta & Arora, 2017)
21	Perceived Credibility	3	(Goh & Sun, 2014), (Yu, 2012), (Al Khasawneh, 2015)
22	External Influence	3	(Giovanis et al., 2021), (Giovanis et al., 2019), (Francisco Liébana-Cabanillas et al., 2014)
23	Cost	2	(Alhassan et al., 2020), (Yu, 2012)
24	Structural Assurances	2	(Oliveira et al., 2014), (Wu et al., 2021)
25	Firm Reputation	2	(Oliveira et al., 2014), (Wu et al., 2021)
26	Privacy Risks	2	(Wei et al., 2021), (Oliveira et al., 2016)
27	Knowledge	2	(Purohit & Arora, 2021), (Koenig-Lewis et al., 2015)
28	Perceived Enjoyment	2	(Yen & Wu, 2016), (Koenig-Lewis et al., 2015)
29	Rural Dwelling	1	(Alhassan et al., 2020)
30	Education	1	(Alhassan et al., 2020)
31	Religiosity	1	(Suhartanto et al., 2019)
32	Institution-based Trust	1	(Thusi & Maduku, 2020)
33	Anticipated Regret	1	(Verkijika, 2020)
34	Reasons for Adoption	1	(Gupta & Arora, 2017)
35	Reasons against Adoption	1	(Gupta & Arora, 2017)
36	Optimism	1	(Rafdinal & Senalasar, 2021)
37	Gamification Impact	1	(Goncalo Baptista & Oliveira, 2017)
38	Individual Performance	1	(Tam & Oliveira, 2016b)

Source: Own work



Source: own work

Figure 1. Mapping of TPE Framework

## CONCLUSION

This study aimed to offer a comprehensive literature review and weight analysis. In order to achieve this aim, 61 studies that focused on mobile financial services methods published during the last decades (2011-2021) were collected and assessed. Based on the results, the following implication for research and practice and conclusions can be drawn.

Most studies emphasized factors impacting the intention to adopt mobile digital financial services employed UTAUT and TAM as theoretical foundations. Specifically, our study makes theoretical contributions: It provides a deep insight into the theories and methods utilized by earlier scholars. For instance, it reveals that the unified theory of acceptance and usage of technology (UTAUT/UTAUT2) is the most popularly applied theory for consumer behavioral intention in the existing literature on mobile financial services and payment methods, followed by the technology acceptance model (TAM) and the task technology fit model (TTF). These findings can help in the development and enrichment of theory-based study by patronizing academicians to ascertain the theories and frameworks that have proven validity and are valuable enough to be taken forward for investigating the adoption of various digital financial innovations.

The most used constructs in literature were acknowledged, and their relevance was underlined, providing an update on current state-of-the-art knowledge. For researchers, this study offers strong support and a complete vision of the most significant variables already investigated at the individual level on mobile financial service adoption. It presents an integrated theoretical model that may be employed as a basis for further improvement of individual acceptance

models as a starting point for future study. For practitioners, understanding the leading constructs and relationships between variables is essential for designing, refining, and implementing mobile financial services that can achieve high consumer acceptance, reinforcing current levels of adoption.

Out of 16 well-utilized predictors affecting intention to adopt, which were investigated through weight analysis, only six performed satisfactorily for the best predictors (i.e., attitude, perceived ease of use, performance expectancy, habit, social norms, and perceived usefulness). Further, the approach used in the systematic literature review found 33 critical factors for human influences using mobile financial services in financial institutions. Within the 38 keys, 11 critical technological factors can be used to design, improve and adjust current mobile financial services with technology conditions. It can therefore become tools to help customers meet the requirements of financial institutions. Therefore, researchers can deduce the variables to be chosen for analyzing consumers' intention to adopt and use behavior toward mobile financial services and payment methods.

## LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

While this study summarizes and extends knowledge focus on mobile financial services and payment methods, there are some limitations. The first ascends from the failure of an initial plan to assess the relations between dependent and independent constructs of the reviewed studies and offer prediction strengths for each. However, in most studies, the data analysis section only

involved tests of those paths that the authors had examined, making it challenging to perform the further analysis needed to attain the planned purpose. For future literature reviews, it is advised that authors consider this issue during their screening process if they wish to carry out a comprehensive meta-analysis. Second, the studies for this research were collected only from Scopus, which limited the number of studies accessible for review and weight analysis. Future research should use a broader range of databases. Third, we followed a

robust study search protocol grounded on relevant keywords, yet, probably, some studies associated with mobile financial services and payment methods could have been missed on account of the absence of our keywords in their title, author keywords, and abstract. Despite these limitations, this is the first comprehensive study of factors affecting the adoption and use of mobile financial services and payment methods focused on the last decades, which provides theoretical and practical directions.

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