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A Review of empirical research on

Internet & Mobile banking in developing countries using UTAUT Model

during the period 2015 to April 2020

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Abstract:

Purpose: The purpose of this review article is to execute and present a comprehensive and systematic literature review of research articles which have used UTAUT models (classic or extended) for studying factors effecting the adoption of internet and mobile banking from 2015 to April 2020 in developing countries.

Design/methodology/approach: This research has identified and studied 28 subject related articles. Data was collected through comprehensive electronic research using search engines of Google Scholar, Yahoo, Base and ProQuest. The search criteria were the keywords internet banking, mobile banking adoption and UTAUT model. For further selection consideration was given to the articles where classic as well as extended UTAUT models were applied. Additionally, the “descriptive” approach was applied to position the internet and mobile banking adoption in the comprehensive internet banking literature stream, from the previous authoritative review of the internet banking adoption literature [2] which covered the period from1999 to 2012.

Findings: The findings from the analysis of primary data collected from developing countries show that the studies have used cross sectional approach, questionnaire/survey methods, and structural equation modelling analysis techniques whereas, SPSS, SEM, PLS were found to be the largely used analysis tools. Moreover, variables such as performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation and price value were the main indicators of behavioral intention. Perceived risk was found to be the most added external variable in UTAUT baseline model.

Practical Implication: This review article provides, for future endeavors, an extensive literature on a specified subject. The findings of this research would make a clear path for potential researchers to develop a new theory for studying the adoption of internet and mobile banking.

Originality/Value: The research has filled the research gap by providing a review of literature on specified subject from 2015 to April 2020 and provided the researchers with additive knowledge about the model used and the factors effecting the adoption of internet and mobile banking.

Keywords: UTAUT, UTAUT2, Electronic Banking, Mobile Banking, Internet Banking, E-Banking, M-Banking

INTRODUCTION

The world is moving towards the ever-growing trend of technological adoption. Advancement in technology is far behind from what it used to be, global leaders are paving their ways for the adoption and usage of latest technologies [1]. Among other sectors, financial sector -especially banking sector is following this emerging trend and has introduced electronic/internet banking and mobile banking. In this article internet banking refers to the “availability of banking products and services via an electronic platform, such as an internet browser or a phone application” [1] while mobile banking refers to the banking activities which can be performed using mobile phones devices [3].The usage and acceptance of the internet and mobile banking among its users is increasing day by day but still it has not been fully adopted and accepted by its users. During the last two decades the consumer acceptance of internet and mobile banking technology, their actual usage and factors influencing their adoption is studied widely. The adoption and usage of technology is studied widely with the help of numerous theoretical models [4,5]. There are numerous theoretical models which have been used extensively in previous researches for studying human behavior towards the adoption of IS especially in internet and mobile banking.Researchers have developed many theories for studying the human behavior towards the usage and adoption of internet and mobile banking. In literature, there are eight prominent theories, each of these theories have pivotal role in the formation of “unified” theory. In order to progress towards unified theory of acceptance and use of technology (UTAUT) theory it is mandatory to “review and synthesis” the major theoretical models [6].The Innovation Diffusion Theory (IDT) studied the behavior of users and it has five main constructs: relative advantage, compatibility, complexity, trialability, and observability [7]. Theory of Reasoned Action (TRA) is the dominant theory used in various studies for studying human behavior of towards technology adoption [8, 51]. Theory of Planned Behavior (TPB) is derived out of TRA with the addition of new construct of Perceived Behavioral Control and this theory was mainly used for studying human intentions and behaviors [9, 10]. Technology Acceptance Model (TAM) has two main variables of perceived usefulness and ease of use, this model is comprehensively used in many studies of human behavior towards technology adoption [11]. TAM2 is an extension of TAM which includes an analysis of how the technology is perceived as useful and how the subjective norm impacts the usage intent [12]. Combined TAM-TPB is the model developed from the constructs of two main theories i.e. TAM and TPB, the main purpose of combining two theories was to do an advanced and improved research [13, 52].Social Cognitive Theory (SCT) is mainly used on large scale, especially in the studies related to computer usage and its utilization [14]. Model of PC Utilization (MPCU) was primarily used for studying PC utilization and this theory is developed out of Theory of Human Behavior [15]. For studying human behavior in the field of Information and Communication Technology Motivational Model (MM) is used prominently [53]. In IT adoption and usage, the latest, most comprehensive and significantly used theory is Unified Theory of Acceptance and Use of Technology (UTAUT), which is a unified form of eight above mentioned theories. This model is used and tested extensively due to its thoroughness over the existing technological acceptance models [16,17]. “The tenants of UTAUT theory hold that the acceptance of research incorporates a series of four moderates that can be used to assess dynamic influences. These dynamic influences include organizational context, user experience, and demographic characteristics.” [1]. This model has four main variables Performance

Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions and two additional variables for studying the human intention and usage i.e., Behavioral Intention and Usage Behavior. These constructs are moderated by age, experience and voluntariness to use [18]. It is emphasized by various researchers [19] to use this model, as comparing to other IT models, only a little research is available on this model. The same UTAUT model was extended [16] which is named UTAUT2 with additional three constructs namely, hedonic motivation, price value, and habit.These two models (UTAUT & UTAUT2) have been employed widely in technology adoption researches for studying human behavior and intention to use that technology. This model is not only used in internet and mobile banking studies but also in the spectrum of e- government, e- health, e- education, hospital information system, tax payment system, internet, websites, mobile banking and technology [20]. Nonetheless, keeping in mind the larger acceptability and usage of these models in various dimensions, no study from 2015 to date has further explored the usage, findings, limitations and potential future research in particular reference to usage of UTAUT & UTAUT2 for studying the factors influencing the adoption of internet and mobile banking. Keeping in mind the other research reviews on UTAUT models [5,20,22,40], in conjunction, this study is likely to be of value which can assist researchers with particular reference to factors influencing the adoption of internet and mobile banking using UTAUT & UTAUT2 theory. This present study would help to understand the prior UTAUT- related findings in internet and mobile banking and would provide future research endeavors. The objective of this research is therefore, to provide such a review.

RESEARCH APPROACH

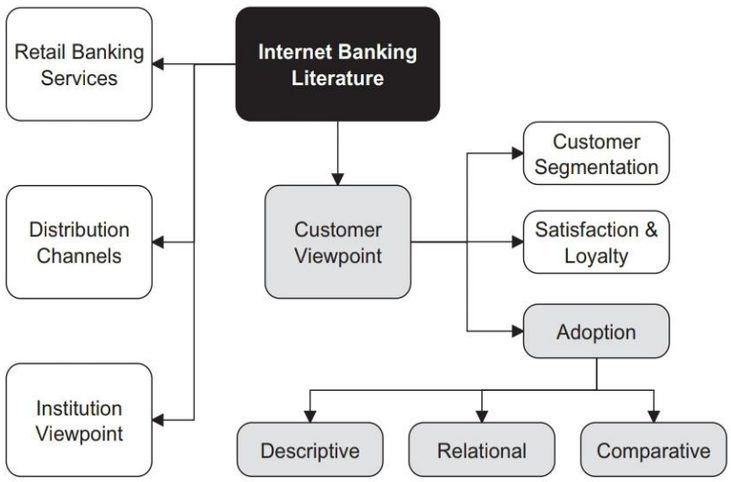
Internet and mobile banking - the emerging technologies- are not fully adopted in many developing countries. Many studies have been conducted for studying the factors influencing the adoption of internet and mobile banking based on UTAUT models. Therefore, it is an attempt to provide the literature review to bring all relevant research together and to provide an opportunity for the future research. For this review 140 research articles were downloaded and studied initially; 100 articles were excluded because they did not fall in to the selection criteria. Out of 40 articles 28 articles were included in this review because they exclusively studied the factors effecting the adoption of internet and mobile banking using UTAUT models (classic or extended) in developing counties. According to [16] there are three different forms of research based on UTAUT models:

1: Classic UTAUT models, with the same exogenous variables that were used in the original study without any additional exogenous variables.
2: Extended UTAUT models, with the same exogenous variables that were used in the original study, along with some newly proposed exogenous variables
3: Partial UTAUT models, with a part of the exogenous variables used in the original study.

This review article has used Classic and Extended models research approach. There are many methods available in literature for writing review articles. This research has used the approach of [2] for positioning the Internet and mobile banking adoption in the literature (figure 1). Internet and mobile banking literature can be studied from the perspective of retail banking services, distribution channels, institutions viewpoint and the customer viewpoint. The systematic review of adoption can be further divided in the three main groups of papers, Descriptive, Relational and Comparative. This research has applied descriptive studies technique. According to [23, 25] descriptive research is the “extract from each study certain characteristics of interest, such as publication year, research methods, data collection techniques, and direction or strength of research outcomes (e.g. positive, negative, or non-significant) in the form of frequency analysis to produce quantitative results”. There are strengths and weaknesses of this type of review for example [24] preferred meta-analysis review because it is more powerful while on the other hand descriptive method helps to “identify any interpretable trends or draw

overall conclusions about the merits of existing conceptualizations, propositions, methods or findings" [25]. The author of this review has adopted the descriptive approach and has written a review with complete focus on the research articles which have employed UTAUT & UTAUT2 (either classic model or extended model) for studying the factors influencing the adoption of internet and mobile banking.

Figure 1: Positioning of IB within the literature



Source: Hanafizadeh et al., (2014)

Research Methodology

This study has reviewed the research articles which have studied the factors influencing the adoption of internet banking & mobile banking using UTAUT & UTAUT2 (either classic model or extended model) from 2015 to April 2020 in developing countries. A comprehensive electronic research has been conducted by using search engines like Google Scholar, Yahoo, Base and ProQuest. This research has used the keywords of "Unified theory of Acceptance and Use of Technology", "UTAUT", "Unified theory of Acceptance and Use of Technology 2" "UTAUT" and "Factors influencing/effecting the adoption/usage of internet banking, Electronic/E-Banking or Mobile/M-Banking" for finding topic-based research articles. To represent the highest level of research, conference papers, master thesis, doctoral thesis, unpublished research work and books were excluded. Different types of journals publications (peer-reviewed, published, in press) were all included. There were 28 out of 140 articles which were selected for writing this review article. These articles have been published in famous journals. Journal of Internet Banking & Commerce (JIBC) was on top of the list with four articles on the specified topic.

FINDINGS

Source of data by Country

The findings of this research revealed that there were total 13 countries (developing countries) where the UTAUT models-based research has been conducted from 2015 to April 2020 for studying the factors affecting the adoption of internet and mobile banking. Primary data has been used in all these countries for data collection. By far, according to figure 2, the most studies were conducted in Pakistan capturing the 36% of total followed by Indonesia and India with 11%, Jordan and Thailand 7%, and remaining 10% cumulatively in Taiwan, Bangladesh, Brazil, Fiji, Lebanon, Zambia, Philippines and Nigeria.

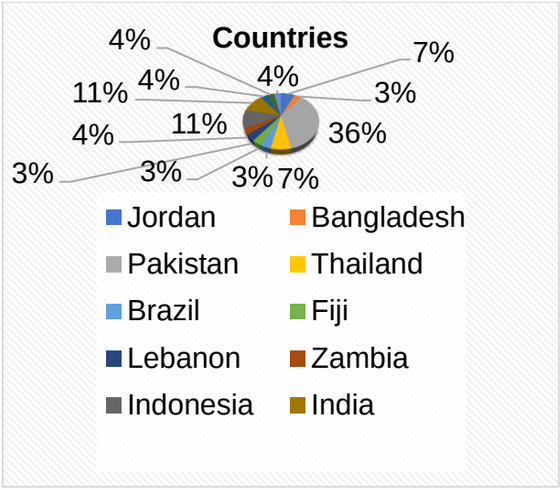


Figure 2: Countries Used for Data Collection Usage

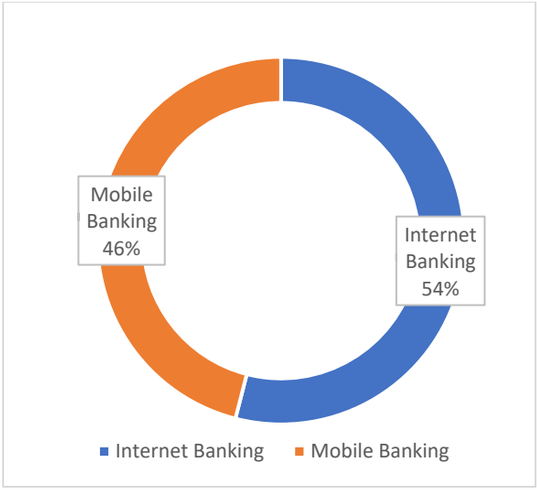


Figure 3: Internet & Mobile Banking

Frequency of Publications

This study has reviewed the research articles which have investigated the factors affecting the adoption of internet & mobile banking based on UTAUT models from the year 2015 to April 2020. This review has found an increasing trend in the usage of UTAUT models specifically with reference to mobile banking and internet banking. The findings indicated that there were two research articles in 2015, four research articles in 2016. Five articles in each 2017 and 2018. A peak was seen in the year 2019 with total nine articles. For the year 2020 there are three articles so far. It is assumed that this UTAUT-related research trend for studying the factors affecting the adoption of internet & mobile Banking would continue to rise.

Methodological Analysis

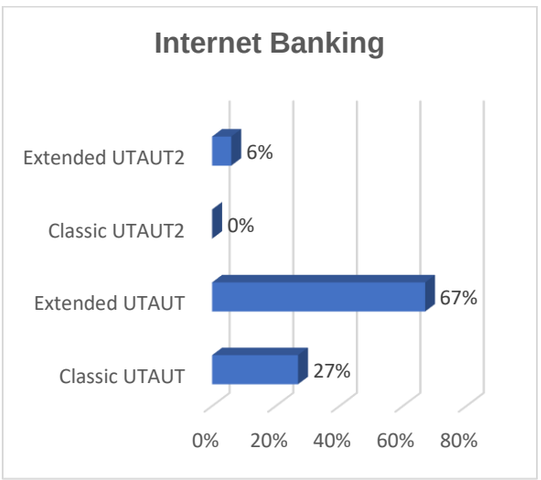
Methodological analysis (Table 1) revealed that all studies have used cross-sectional research approach. Majority of the studies have applied the survey/questionnaire method for data collection while [26] have used the Delphi method and the study [27] has used mixed method approached for data collection. The most commonly used data analysis methods were SEM, SEM-AMOS, SPSS, ANOVA and Factor Analysis. Additionally, analysis tools like SMART PLS, SPSS, AMOS and LISREL were frequently used.

Internet & Mobile Banking Usage

The analysis of 28 subject specific studies revealed that 54% of research articles have used UTAUT models (either classic or extended) for studying the factors effecting the adoption of internet banking whilst 46% of research articles have used UTAUT models (either classic or extended) for studying the factors effecting the adoption of mobile banking. Figure 3.

Table 1: Methodological Analysis

Procedure	Description	Reference
Research Technique	Cross Sectional	De Sena et al., (2016), Sarfraz (2017), Alalwan (2018), Malik M., (2020), Iskandar et al., (2020)
Collection of Data	Survey/Questionnaire Delphi Method Mixed Method	Huang & Kao (2015), Johar & Suhartanto (2019), Bhatiasevi (2016)
Analysis Technique	Structural Equation Modeling (SEM) SEM – AMOS SPSS 16.0 SPSS 20 ANOVA FACTOR ANALYSIS	Abbas et al., (2018), Tarhini et al., (2016), Malik M., (2020), Rahi et al., (2019)
Software	SPSS AMOS SMART PLS LISREL	Malik M., (2020), Rahi et al., (2019), Daka, & Phiri (2019), Iskandar et al., (2020)



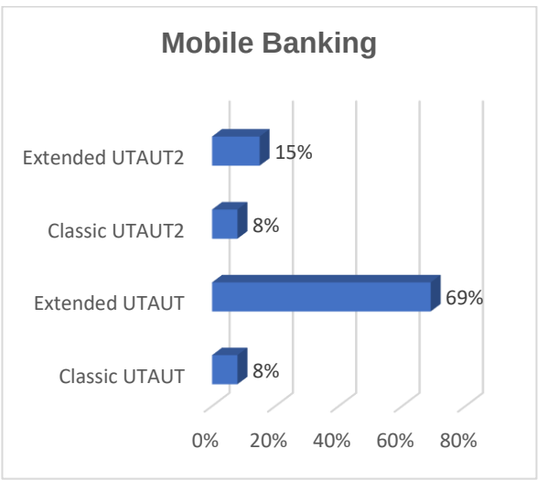


Figure 4: Statistics of internet banking studies **Figure 5:** Statistics of mobile banking studies

Comparison of studies based on UTAUT models

The findings of 28 studies disclosed that from 28 research articles, 15 were on internet banking which have employed base-line UTAUT models for studying the factors effecting its adoption. The analysis of these 15 (54% internet banking) research articles revealed that 67% of these studies have extended the UTAUT model (figure 4) while more than a quarter of these studies have used the classic UTAUT model. Surprisingly, the studies which have integrated classic UTAUT2 is zero percent. The studies which have extended UTAUT2 contributed the percentage of 6%. The remaining 13 research articles were on m-banking which have employed UTAUT models for studying the

factors effecting its adoption. The analysis of 13 (46% mobile banking) research articles represented that nearly 70% of studies have extended UTAUT model (figure 5) while only 8% studies employed the classic UTAUT model. The studies which have used classic UTAUT2 and extension UTAUT2 shared the percentages of 8% and 15% respectively. The overall analysis of this part showed a clear picture that these 2 models of UTAUT and UTAUT2 need further improvement and it is now time for the prospective researchers to develop a more comprehensive theory, all encompassing, for studying the adoption of internet banking or mobile banking.

Table 2: List of extended UTAUT Variables

Variables	**No.of Studies**	**Authors**
Perceived Risk	5	De Sena et al., (2016), Sarfraz (2017), Alalwan (2018), Malik M., (2020), Iskandar et al., (2020)
Website Design	4	Giri & Wellang (2016), Rahi et al., (2019), Rahi et al., (2019), Rahi et al., (2019)
Task Technology Fit	3	Ahmed et al., (2017) Abbas et al., (2018) Tarhini et al., (2016)
Perceived Credibility	3	Tarhini et al., (2016), Bhatiasevi (2016), Gupta et al., (2019)
Perceived Cost	3	De Sena et al., (2016), Bhatiasevi (2016), Raza et al., (2019)
Trust	3	Sarfraz (2017), Khan et al., (2019), Malik M., (2020)
Assurance	3	Rahi et al., (2019), Rahi et al., (2019), Rahi et al., (2019)
Reliability	3	Rahi et al., (2019), Rahi et al., (2019), Rahi et al., (2019)
Customer Service	3	Rahi et al., (2019), Rahi et al., (2019), Rahi et al., (2019)

Extended UTAUT Variables

The analysis of figure 4 and figure 5 exhibited that 67% of the studies have used extended UTAUT model for investigating the factors effecting the adoption of internet banking while nearly 70% of the studies have used extended UTAUT model for investigating the factors effecting the adoption of mobile banking. Table 2 has presented a list of frequently used variables which have been utilized by various researchers for extending their UTAUT models in this specific field of research. The analysis showed that most recurring variable was Perceived risk which has occurred five times in different studies [1, 28-31]. The frequent occurrence of risk factor has made it clear that the customers of IT adoption are more concerned about risk factor. The second repeatedly used variable was Website design which has been added in 4 distinct studies [32-35] The variables of Task Technology Fit [17, 36, 37] , Perceived Credibility [27,37,38], Perceived Cost [27, 28, 39] and Trust [1,21,29] have appeared three times equally in different research articles. The variables Assurance, Reliability, Customer service were used repeatedly in three individual studies [33,34,35]. The

all-inclusive analysis has represented that among other variables (table 3) which have been used for extending UTAUT models, nine variables (table 2) have been used most frequently. This review suggests that these variables could be made a permanent part of either UTAUT models or could be used as variables for a new theory which would be for internet banking and mobile banking adoption studies.

Discussion of Results

The overall results of the 29 studies have found the main variables namely performance expectancy, effort expectancy, social influence and social influence are the key indicators of human behavior for studying the actual usage of the internet banking and mobile banking.The findings of [30] found the Positive influence of performance expectancy, effort expectancy, hedonic motivation, price value and perceived risk on behavioral intention except, social influence. The research findings of [17] revealed that Social influence is significant factor in adopting m-Banking. Additionally, Task-technology fit, Technology characteristics, Performance expectancy facilitating conditions, Task characteristics, and User adoption have great impact on attitude towards mobile banking services.The findings of [36] found positive relationship of Task Technology fit, performance expectancy, effort expectancy, facilitating conditions, social influence with the user intention to adopt technology. Results of [27] revealed that performance expectancy, effort expectancy, social influence, perceived credibility, perceived convenience, and behavioral intention to use mobile banking have positive relationship while hypotheses testing cost and facilitating conditions in the adoption of mobile banking were not significant. According to the study findings of [41] facilitating conditions and self-efficacy in mobile banking application do not exhibit a direct effect on behavioral intention. The results of [28] revealed that performance expectation, effort expectation, social influence and perceived risk have positive influence on behavioral intention while the opposite was true for Perceived cost. Results of [42] have found significant impact of performance expectancy, effort expectancy, facilitating conditions and behavior intention in the adoption of e-banking services. Social influence (SI) was non-significant to the user's intention to adopt e banking services.The findings of [32] revealed that performance expectancy has a significant effect on effort expectancy and social influences in the adoption of e-banking. Website design has impact on the usage of e-banking. Prior experience has in effort expectancy in the adoption of e-banking. The results of [38] revealed that all factors are direct determinants of behavioral intention additionally, there is still need of improvement and the constructs like hedonic motivation, perceived risks and trialability would be a good path for future.The results of [26] revealed that behavioral intention, hedonic motivation, and performance expectancy are the most important dimensions in the adoption if mobile banking technology. The study [31] has found observability, performance expectation, hedonic motivation, facilitating conditions have significant impact on behavior intentions while perceived risk, and price value have negative impact on behavior intention. The results of [44] revealed that expected performance and religious factor are the most important factors for Islamic banking customers to adopt online services.The findings of [45] suggests that performance expectancy, facilitating conditions, habit, perceived security, and price value have positive influence on behavioral intentions. The cultural dimensions, collectivism, and uncertainty avoidance were significant moderators in explaining behavioral intention and usage behavior for online banking. The results of [21] revealed that performance expectancy, social influence, and effort expectancy have significant and positive impact on behavioral intentions of rural customers in Pakistan. Moreover, personality openness significantly shapes behavioral intentions and trust on the internet moderates between customers' intentions and their usage of e-banking.The results of [46] revealed that determinants of behavioral intention to adopt digital mortgage banking were facilitating conditions, performance expectancy and effort expectancy. The study of [1] found significant impact of performance expectancy, effort expectancy, facilitating conditions, social influence, security, risk and trust on behavior intention and actual usage in the adoption of e-banking services. The findings of [47] depicted the positive correlation between customer service, type of bank and perceived ease of use and the use of m-banking.The study of [48] found positive relationship

among all is variable and found UTUAT the best fitted model for e-banking studies. The findings of [49] confirmed that all four variables performance expectancy, effort expectancy, social influence and facilitating condition had significant amount of variance in predicting user's intention to adopt internet banking.The results of [50] found that performance expectancy, effort expectancy, social influence, hedonic motivation and perceived technology security had significant influence on user's intention to adopt internet banking. Additionally, IPMA analysis show that among all construct's hedonic motivation and perceived technology security had the highest impact on user's intention to adopt internet banking.The results of [33] provided theoretical and empirical support for newly developed integrated model. Importance performance matrix analysis (IPMA) revealed that assurance is the most influential factor among all others to determine user's intention to adopt internet banking. The findings of [34] revealed that UTAUT model has significant influence on user intention to adopt internet banking. The study of [35] found that approximately 79 percent of variance in user intention to adopt internet banking was explained by predictors. In addition, the mediating role of performance expectancy and effort expectancy among website design, customer service and user intention were also confirmed.The results of [39] showed a significant positive effect on intention and actual usage except for social influence. The results of [29] revealed that performance expectancy; effort expectancy and risk perception have influence on user's intention to adopt mobile banking services while, no significant relations found for social influence and trust. The results of [43] revealed that e-banking adoption is positively influenced by the levels of performance expectancy, effort expectancy, social influence and facilitating conditions while perceived risk negatively influences IB usage intention.The study of [37] revealed that performance expectancy, social influence, PC and TTF are significant predictors in influencing customers' behavioral intention (BI) to use IB. The results of [3] revealed that mobile banking intentions mediates the relationship effort expectancy and use behavior, performance expectancy and use behavior and social influence and use behavior additionally they found no gender differences among entrepreneurs.

Table 3: Summary of findings

Authors / Source	Theory	Country	Research Purpose	Main Variables	Extension of UTAUT/ UTAUT2	Methodology	Results
Abbas et al., (2018)	UTAUT	Pakistan	To analyze user perception towards mobile banking adoption with concentration of “TTF” task technology fit and “UTAUT”	performance expectancy, effort expectancy, facilitating conditions, social influence, Task Technology fit (TTF)	Task Technology Fit	Questionnaire	They found positive relationship of Task Technology fit, performance expectancy, effort expectancy, facilitating conditions, social influence with the user intention to adopt technology.
Ahmed et al., (2017)	UTAUT	Bangladesh	Integrated task technology fit (TTF) and UTAUT for examining users' perception and intentions to adopt m-Banking services	Task-technology fit, Performance expectancy, effort expectancy, social influence, facilitating conditions,	Task Technology Fit	Questionnaire	The research revealed that Social influence is significant factor in adopting m-Banking. Additionally, Task-technology fit, Technology characteristics, Performance expectancy facilitating conditions, Task characteristics, and User adoption have great impact on attitude towards mobile banking services.
Alalwan et al., (2018)	UTAUT 2	Jordan	To identify the factors influencing Jordanian customers' intentions and adoption of Internet banking.	Performance expectancy, effort expectancy, hedonic motivation, price value, perceived risk, social influence & behavioral intention.	Extended UTAUT2 by adding “Perceived Risk”	Survey Questionnaire	Positive influence of performance expectancy, effort expectancy, hedonic motivation, price value and perceived risk on behavioral intention except, social influence

Bhatiasevi (2016)	UTAUT	Thailand	Studied the factors effecting the adoption of mobile banking	performance expectancy, effort expectancy, facilitating conditions, social influence, behavioral intention, perceived credibility, perceived cost, and perceived convenience.	perceived credibility, perceived cost, and perceived convenience.	Mixed method approach	Results revealed that performance expectancy, effort expectancy, social influence, perceived credibility, perceived convenience, and behavioral intention to use mobile banking have positive relationship while hypotheses testing cost and facilitating conditions in the adoption of mobile banking were not significant
Boonsiritomachai, & Pitchayadejanant, (2017)	UTAUT	Thailand	Determined the factors affecting behavioral intention to adopt mobile banking among generation Y	performance expectancy, effort expectancy, facilitating conditions, social influence, Security, Self-Efficacy, used hedonic motivation has mediator	Security, Self-Efficacy, used hedonic motivation has mediator	Questionnaire	According to the study findings, facilitating conditions and self-efficacy in mobile banking application do not exhibit a direct effect on behavioral intention, they have a positive effect on hedonic motivation. In addition, security factor has a negative effect on hedonic motivation.
Daka, & Phiri (2019)	UTAUT	Zambia	Determined the factors underlying the adoption of e-banking	performance expectancy, effort expectancy, facilitating conditions, social influence	--	Questionnaire	significant impact of performance expectancy, effort expectancy, facilitating conditions and behavior intention in the adoption of e-banking services. Social influence (SI) was non-significant to the user's intention to adopt e banking services.

De Sena et al., (2016).	UTAUT	Brazil	evaluated the adoption of future mobile payment service using UTAUT.	performance expectancy, effort expectancy, social influence, perceived risk and perceived cost	perceived risk and perceived cost	Questionnaire	The results revealed that performance expectation, effort expectation, social influence and perceived risk have positive influence on behavioral intention while the opposite was true for Perceived cost
Giri & Wellang, (2016)	UTAUT	Indonesia	determined the effect of expectancy effort, social influence, performance expectancy, website design, experience on the usage of Internet banking	performance expectancy (as mediator), effort expectancy, social influence, website design, prior experience	website design, prior experience	Questionnaire	Results revealed that performance expectancy has a significant effect on effort expectancy and social influences in the adoption of e-banking. Website design has impact on the usage of e-banking. Prior experience has in effort expectancy in the adoption of e-banking.
Gupta et al., (2019)	UTAUT	India	Studied the factors influencing the behavioral intention to adopt banks services	performance expectancy, effort expectancy, facilitating conditions, social influence, perceived credibility,	perceived credibility	Questionnaire	The results revealed that all factors are direct determinants of behavioral intention additionally there is still need of improvement and the constructs like hedonic motivation, perceived risks and trialability would be a good path for future

Huang & Kao (2015)	UTAUT2	Taiwan	Explored and predicted the intentions and use behaviors of mobile banking devices like Phablets.	performance expectancy, effort expectancy, facilitating conditions, hedonic motivation, price value, social influence, habit behavioral intention	--	Delphi Method	The results revealed that behavioral intention, hedonic motivation, and performance expectancy are the most important dimensions in the adoption if mobile banking technology
Iskandar et al., (2020)	UTAUT2	Indonesia	Investigated factors influencing behavioral intention to use Mobile banking	performance expectancy, effort expectancy, facilitating conditions, hedonic motivation, price value, social influence, experience, perceived risk and observability	perceived risk and observability	Questionnaire	The results revealed, observability, performance expectation, hedonic motivation, facilitating conditions have significant impact on behavior intentions while perceived risk, and price value have negative impact on behavior intention.
Johar & Suhartanto (2019)	UTAUT	Indonesia	Identified the factors effecting online internet banking from the customers of Islamic Banking	performance expectancy, effort expectancy, facilitating conditions, social influence, religiosity	Religiosity	Questionnaire	The results revealed that expected performance and religious factor are the most important factors for Islamic banking customers to adopt online services
Khan et al., (2017)	UTAUT 2	Pakistan	Identified the key elements in the adoption of e-banking in developing country	performance expectancy, effort expectancy, hedonic motivation, price value, perceived security, social influence, habit behavioral intention. Moderating role of Individualism/Collectivism and uncertainty avoidance	Extended UTAUT 2 by adding perceived security and Individualism/Collectivism and uncertainty avoidance as moderator	Survey Questionnaire	performance expectancy, facilitating conditions, habit, perceived security, and price value have positive influence on behavioral intentions. The cultural dimensions, collectivism, and uncertainty avoidance were significant moderators in explaining behavioral intention and usage behavior for online

							banking.
Khan et al., (2019)	UTAUT	Pakistan	Identifying key factors effecting the adoption of e-banking in rural areas of Pakistan	performance expectancy, effort expectancy, facilitating conditions, social influence, personality openness and trust as moderator	Added Personality openness and use trust as a moderator between behavioral intention and usage	Survey Questionnaire	performance expectancy, social influence, and effort expectancy have significant and positive impact on behavioral intentions of rural customers in Pakistan. Moreover, personality openness significantly shapes behavioral intentions and trust on the internet moderates between customers' intentions and their usage of e-banking.
Malik M., (2020)	UTAUT	Pakistan	Identified the elements influencing the adoption of e-banking	performance expectancy, effort expectancy, facilitating conditions, social influence, security, risk and trust	Extended model by adding security, risk and trust	Survey Questionnaire	significant impact of performance expectancy, effort expectancy, facilitating conditions, social influence, security, risk and trust on behavior intention and actual usage in the adoption of e-banking services.
Morales & Trinidad (2019)	UTAUT	Philippines	Investigated the digitization of mortgage banking using the UTAUT	performance expectancy, effort expectancy, facilitating conditions, social influence and behavioral intention	--	Survey Questionnaire	Results revealed that determinants of behavioral intention to adopt digital mortgage banking were facilitating conditions, performance expectancy and effort expectancy.

Olasina (2015)	UTAUT	Nigeria	Identified factors influencing m-banking adoption in Nigeria	Perceived usefulness, perceived ease of use, social influence, ICT skills and behavioral intention	modified	Survey Questionnaire	Findings depicted the positive correlation between customer service, type of bank and perceived ease of use and the use of m-banking.
Rahi et al., (2018)	UTAUT	Pakistan	Investigated the role of unified theory of acceptance and use of technology (UTAUT) in internet banking adoption context	performance expectancy, effort expectancy, facilitating conditions, social influence	--	Questionnaire	findings confirmed that all four variables performance expectancy, effort expectancy, social influence and facilitating condition had significant amount of variance in predicting user's intention to adopt internet banking
Rahi et al., (2018)	UTAUT2	Pakistan	Developed an integrated technology adoption model with extended UTAUT2 model and perceived technology security to predict and explain user's intention to adopt internet banking and intention to recommend internet banking in social networks.	performance expectancy, effort expectancy, social influence, hedonic motivation and perceived technology security	Added perceived technology security in the existing model	Questionnaire	Convergence and divergence with earlier findings were found, confirming that performance expectancy, effort expectancy, social influence, hedonic motivation and perceived technology security had significant influence on user's intention to adopt internet banking. Additionally, IPMA analysis show that among all construct's hedonic motivation and perceived technology security had the highest impact on user's intention to adopt internet banking
Rahi et al., (2019)	UTAUT	Pakistan	Evaluated the integration of UTAUT model	performance expectancy, effort expectancy, facilitating conditions,	Added Assurance, reliability, website design, customer service	Questionnaire	The results of this study provided theoretical and empirical support for newly

			(UTAUT+ESQ) effects on user intention to adopt internet banking.	social influence, assurance, reliability, website design, customer service			developed integrated model. Importance performance matrix analysis (IPMA) revealed that assurance is the most influential factor among all others to determine user's intention to adopt internet banking
Rahi et al., (2019)	UTAUT	Pakistan	Studied adoption of internet banking using unified theory of acceptance and use of technology (UTAUT) and electronic service (e-service) quality	performance expectancy, effort expectancy, facilitating conditions, social influence, assurance, reliability, website design, customer service	Added Assurance, reliability, website design, customer service	Questionnaire	UTAUT model had significant influence on user intention to adopt internet banking
Rahi et al., (2019)	UTAUT	Pakistan	Incorporated the unified theory of acceptance and use of technology factors, and e-service quality (E-SQ), as theoretical lens for this study	performance expectancy, effort expectancy, website design, customer service, assurance and reliability	Added Website design, customer service, assurance and reliability	Questionnaire	Results revealed that approximately 79 percent of variance in user intention to adopt internet banking was explained by predictors. In addition, the mediating role of performance expectancy and effort expectancy among website design, customer service and user intention were also confirmed
Rajendran et al., (2017)	UTAUT	India	Studied the customer attitude towards the adoption of online banking using	performance expectancy, effort expectancy, facilitating conditions, social influence	--	Questionnaire	The study found positive relationship among all is variable and found UTUAT the best fitted model for e-banking studies

			UTAUT.				
Raza et al., (2019)	UTAUT	Pakistan	Studied the factors which affect mobile banking adoption using UTUAT	performance expectancy, facilitating conditions, social influence, effort expectancy, perceived value, habit and hedonic motivation, intention to adopt M-banking (mediator), and actual usage	perceived value, habit and hedonic motivation	Survey method	Results showed a significant positive effect on intention and actual usage except for social influence
Sarfraz (2017)	UTAUT	Jordan	Studied mobile banking adoption using (UTAUT)	performance expectancy, effort expectancy, social influence, risk and trust	Risk and trust	Questionnaire	Results revealed that performance expectancy; effort expectancy and risk perception have influence on user's intention to adopt mobile banking services while, no significant relations found for social influence and trust
Sharma et al., (2020)	UTAUT	Fiji	To Investigate the behavioral intention to adopt internet banking (IB) in Fiji	Performance expectancy, effort expectancy, perceived risk, social influence facilitating conditions. Moderating role of Individualism and uncertainty avoidance	Added customer satisfaction and perceived risk constructs and cultural moderators of individualism and uncertainty avoidance	Questionnaire	Results revealed that e-banking adoption is positively influenced by the levels of performance expectancy, effort expectancy, social influence and facilitating conditions while perceived risk negatively influences IB usage

							intention.
Tarhini et al., (2016)	UTAUT	Lebanon	To investigate the factors that may hinder or facilitate the acceptance and usage of IB in Lebanon.	Performance expectancy, effort expectancy, perceived risk, social influence facilitating conditions perceived credibility and task-technology fit	Added perceived credibility and task-technology fit	Questionnaire	Results revealed that performance expectancy, social influence, PC and TTF are significant predictors in influencing customers' behavioral intention (BI) to use IB
Varma, A. (2018)	UTAUT	India	This study investigated the entrepreneurial usage of mobile banking services	performance expectancy, effort expectancy, social influence, facilitating conditions	--	Questionnaire	The results revealed that mobile banking intentions mediates the relationship effort expectancy and use behavior, performance expectancy and use behavior and social influence and use behavior additionally they found no gender differences among entrepreneurs

CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

The aim of this research was to provide a comprehensive and systematic literature review of internet and mobile banking studies which have used UTAUT models (classic or extended) from 2015 to April 2020 in developing countries. The extensive literature review and desk research approach was used using various search engines such as Google, Base, Yahoo and ProQuest for finding the relevant literature within a prescribed relevant field. This study ended up with 28 research articles which were exclusively for internet and mobile banking using UTUAT models. The findings of this research were concluded under the headings of source of data by country, frequency of publications, methodological analysis, internet and mobile banking usage, comparison of studies based on UTAUT models and extended UTAUT variables. The findings have concluded that 36% data collection was from Pakistan followed by India additionally, Journal of Internet Banking and Commerce has most publications on this topic. Majority of the researchers have modified the UTAUT models which means that there is need and time for potential researchers to present a subject specific standalone theory for studying the factors affecting the adoption of the emerging technologies like internet and mobile banking.The intention to conduct this review was to provide a useful and usable resource for future researchers by providing information on the key areas. UTAUT has evolved and been empirically tested extensively, and by introducing new variables in various contexts, cultures and environments. There is still ample space for the researchers to develop a comprehensive standalone model in the field of internet and mobile banking adoption. This research was limited to the subject specialist topic in the developing countries and has studied only one theory. The author has tried to fill gap to provide a literature review in subject-specialist area and tried to cover all relevant studies under it but still the author fully acknowledged that there could be some other studies in the same context which might have been skipped unintentionally. A comparative study can further be undertaken to investigate the factors influencing adoption of internet banking and mobile banking in developed countries and developing countries.

REFERENCES

1. Malik M (2020) Elements influencing the adoption of Electronic Banking in Pakistan An Investigation carried out by using Unified Theory of Acceptance and Use of Technology (UTAUT) Theory. Journal of Internet Banking and Commerce 25:2.
2. Hanafizadeh P, Keating BW and Khedmatgozar H R (2014) A systematic review of Internet banking adoption. Telematics and informatics, 31:492-510.
3. Varma A (2018) Mobile Banking Choices of Entrepreneurs: A Unified Theory of Acceptance and Use of Technology (UTAUT) Perspective. Theoretical Economics Letters, 8:2921.
4. Hafeez-Baig A, Gururajan R and Wickramasinghe N (2018) Readiness as a Novel Construct of Readiness Acceptance Model (RAM) for the Wireless Handheld Technology. In Technology Adoption and Social Issues: Concepts, Methodologies, Tools, and Applications 27-45.
5. Abu FB, Jabar JB and Yunus ARB (2014) A Review Unified Theories of Acceptance and Use of Technology (UTAUT): Technology Empowering and Acceptance in Malaysia. 8th MUCET 2014. Melaka, Malaysia.
6. Morris MG, Hall M and Davis GB (2003) User Acceptance of Information Technology: Toward A Unified View 1, 27:425– 478.
7. Rogers EM (1995) Diffusion of Innovations (4th ed.), The free press, New York pp. 208
8. Sheppard BH, Hartwick J and Warshaw PR (1988) The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. Journal of Consumer Research 15: 325-343.

9. Ajzen (1991) The theory of planned behavior. Organizational Behavior and Human Decision Processes 50: 179-211.
10. Ajzen I (1985) From intentions to actions: A theory of planned behavior. In Action control, Springer, Berlin, Heidelberg.11-39.
11. Davis FD (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly 319-340.
12. Venkatesh V, Davis FD (2000) A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science 46:186-204.
13. Samaradiwakara GDMN, Gunawardena CG (2014) Comparison of existing technology acceptance theories and models to suggest a well improved theory/model. International technical sciences journal, 1:21-36.
14. Compeau DR, Higgins CA (1995) Computer self-efficacy: Development of a measure and initial test. MIS Quarterly 189-211.
15. Thompson RL, Higgins CA and Howell JM (1991) Personal computing: toward a conceptual model of utilization. MIS Quarterly 125-143.
16. Venkatesh V, Thong JY and Xu X (2012) Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS Quarterly 157-178.
17. Ahmed Z, Kader A and Nurunnabi M (2017) User perception of mobile banking adoption: an integrated TTF-UTAUT model.
18. Venkatesh V, Morris MG, and Davis FD (2003) User acceptance of information technology: Toward a unified view. MIS Quarterly 425-478.
19. Venkatesh V, Zhang X (2010) Unified theory of acceptance and use of technology: US vs. China Journal of Global Information Technology Management 13: 5-27
20. Williams MD, Rana NP and Dwivedi YK (2015) The unified theory of acceptance and use of technology (UTAUT): a literature review. Journal of enterprise information management.
21. Khan IU, Hameed Z and Hamayun M (2019) Investigating the Acceptance of Electronic Banking in the Rural Areas of Pakistan: An Application of the Unified Model. Business and Economic Review, 11:57-87.
22. Venkatesh V, Thong JY and Xu (2016) Unified theory of acceptance and use of technology: A synthesis and the road ahead. Journal of the Association for Information Systems, 17: 328-376.
23. Paré G, Trudel MC and Kitsiou S (2015) Synthesizing information systems knowledge: A typology of literature reviews. Information & Management, 52:183-199.
24. Sylvester A, Tate M and Johnstone D (2013) Beyond synthesis: Re-presenting heterogeneous research literature. Behaviour & Information Technology, 32:12.
25. Pare G, Kytsiou S (2017) Methods for literature reviews. In: F. Lau, & C. Kuziemsky (Eds.), Handbook of eHealth Evaluation: An Evidence-based Approach. Victoria: University of Victoria.
26. Huang CY, Kao YS (2015) UTAUT2 based predictions of factors influencing the technology acceptance of phablets by DNP. Mathematical Problems in Engineering, 2015.
27. Bhatiasevi V (2016) An extended UTAUT model to explain the adoption of mobile banking. Information Development, 32:799-814.
28. De Sena Abrahão R, Moriguchi SN and Andrade DF (2016) Intention of adoption of mobile payment: An analysis in the light of the Unified Theory of Acceptance and Use of Technology (UTAUT). RAI Revista de Administração e Inovação, 13:221-230.
29. Sarfaraz J (2017) Unified theory of acceptance and use of technology (Utaut) model-mobile banking. Journal of Internet Banking and Commerce, 22:1-20.
30. Alalwan AA, Dwivedi YK and Algharabat R (2018) Examining factors influencing Jordanian customers' intentions and adoption of internet banking: Extending UTAUT2 with risk. Journal of Retailing and Consumer Services, 40:125-138.

31. Iskandar M, Hartoyo H and Hermadi I (2020) Analysis of Factors Affecting Behavioral Intention and Use of Behavioral of Mobile Banking Using Unified Theory of Acceptance and Use of Technology 2 Model Approach. International Review of Management and Marketing, 10:41-49.
32. Giri RRW, Wellang KM (2016) Impact of website design, trust, and internet skill on the behaviour use of site internet banking in Bandung Raya: A modification of the Utaut Model. Pertanika International Journal of Social Science and Humanities (JSSH), 24:35-50.
33. Rahi S, Ghani MA and Ngah AH (2019) Integration of unified theory of acceptance and use of technology in internet banking adoption setting: Evidence from Pakistan. Technology in Society, 58, 101120.
34. Rahi S, Mansou MMO and Alnaser, FM (2019) Integration of UTAUT model in internet banking adoption context. Journal of Research in Interactive Marketing.
35. Rahi S, Ghani MA (2019) Investigating the role of UTAUT and e-service quality in internet banking adoption setting. The TQM Journal.
36. Abbas SK, Hassan HA and Waris A (2018) Assimilation of TTF and UTAUT for Mobile Banking Usage. International Journal of Advanced Engineering, Management and Science (IJAEMS) 4.
37. Tarhini A, El-Masri M and Serrano A (2016) Extending the UTAUT model to understand the customers' acceptance and use of internet banking in Lebanon. Information Technology & People.
38. Gupta KP, Manrai R and Goel U (2019) Factors influencing adoption of payments banks by Indian customers: extending UTAUT with perceived credibility. Journal of Asia Business Studies.
39. Raza SA, Shah N and Ali M (2019) Acceptance of mobile banking in Islamic banks: evidence from modified UTAUT model. Journal of Islamic Marketing.
40. Khan YMH (2019) An Essential Review of Internet Banking Services in Developing Countries. e-Finanse, 15:73-86.
41. Boonsiritomachai W, Pitchayadejanant K (2017) Determinants affecting mobile banking adoption by generation Y based on the Unified Theory of Acceptance and Use of Technology Model modified by the Technology Acceptance Model concept. Kasetsart Journal of Social Sciences.
42. Daka CG, Phiri J (2019) Factors Driving the Adoption of E-Banking Services Based on the UTAUT Model. International Journal of Business and Management, 14.
43. Sharma R, Singh G and Sharma S (2020). Modelling internet banking adoption in Fiji: A developing country perspective. International Journal of Information Management, 53, 102116.
44. Johar RS, Suhartanto D (2019) The Adoption of Online Internet Banking in Islamic Banking Industry. In IOP Conference Series: Materials Science and Engineering 662:3. IOP Publishing.
45. Khan I U, Hameed Z and Khan SU (2017) Understanding online banking adoption in a developing country: UTAUT2 with cultural moderators. Journal of Global Information Management (JGIM), 25:43-65.
46. Morales DT, Trinidad FL (2019) Digital mortgage banking acceptability in philippine universal banks: evidence from utaut model. Journal of Information, 4:1-15.
47. Olasina G (2015) Factors influencing the use of m-banking by academics: case study sms-based m-banking. The African Journal of Information Systems, 7:4.
48. Rajendran A, Shenoy SS and Shetty K (2017) Understanding the Customer's Attitude Towards Acceptance and Usage of Online Banking Services Using Utaut Model. International Journal of Economic Research, 14:465-478.
49. Rahi S, Ghani M and Ngah A (2018) A structural equation model for evaluating user's intention to adopt internet banking and intention to recommend technology. Accounting, 4:139-152.
50. Rahi S, Ghani M and Ngah, A. (2018). Investigating the role of unified theory of acceptance and use of technology (UTAUT) in internet banking adoption context. Management Science Letters, 8:173-186.

51. Taylor S, Todd PA (1995) Understanding information technology usage: A test of competing models. Information systems research, 6:144-176.
52. Fishbein M, Ajzen I (1975) Belief, attitude, intention, and behavior: an introduction to theory and research.
53. Bandura A (1986) The explanatory and predictive scope of self-efficacy theory. Journal of social and clinical psychology, 4:359-373.