

## CHAPTER 2 Literature Review

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### *Preview*

The chapter makes an attempt to provide a comprehensive overview of the various factors and their effect on the intention to adopt mobile payments. These variables are widely used to explain the consumer's adoption behaviour and the theories associated with it. The Chapter is portioned into four sections where section 2.1 offers an overview of the background of mobile payment in India. The following section 2.2 is devoted to the narrative review of the available theoretical models on technology adoption. The empirical studies available are analysed in section 2.3 to calculate the overall effect size of the variables. Finally, the gaps are presented in section 2.3.5.

### **2.1. Introduction**

In any country economic activity is settled by conducting a financial transaction where there is a transfer of currency from one party to another. Facilitation of this transaction is carried smoothly if the country has a developed financial system with institutions recognized by the regulator. The reserve bank of India (RBI) is the regulator which is at the helm of formulating and implementation of policies. The preamble of the RBI Act (Reserve Bank of India Act , 1934, 2019, p. 14) is as follows which delineates its functions as:

*“To regulate the issue of Bank notes and keeping of reserves with a view to securing monetary stability in India and generally to operate the currency and credit system of the country to its advantage; to have a modern monetary policy framework to meet the challenge of an*

*increasingly complex economy, to maintain price stability while keeping in mind the objective of growth.”*

For a long time, the financial ecosystem revolved around the use of instruments like cash and cheques as a form of currency to facilitate economic activity. Development in the field of ICT has led to new ways of conducting financial transactions. The new ways are transferring currency through National electronic fund transfer (NEFT), real-time gross settlements (RTGS), etc. [ A detailed list is already provided in Table 1.2]. The use of these technologies is facilitated by various channels e.g., unstructured supplementary services data (USSD), Credit card, short message service (SMS), near field communication devices (NFC), digital wallets, internet banking and mobile banking applications.

The use of mobile payment as an alternative form of currency payment started back in 1981 when Andhra bank issued the first credit card in India, 30 years after their first use in USA (2008). Currently there are four types of cards operational in India these are credit, debit, prepaid and electronic. Use of SMS, USSD, NFC has found limited amount of success in India.

Over last decade the popularity of mobile payment has surpassed paper-based payments. The bottleneck faced due to feature phone are no longer hindering the adoption of mobile payments. The revolution in the wide use of mobile payment is due to the ease of access for mobile payment application and wallets due to the wide availability of mobile devices such as mobile phones and tablets. Oxigen wallet is considered as the first ever service provider of mobile wallet in India. It was launched in 2004 and was followed by wallet365.com backed by times group in 2006. These wallets failed to have any impact on the payment landscape. Significant inroads were made by Mobikwik wallet after its launch in 2009. Other service providers of mobile wallet are Google pay backed by google, Phone pe backed by Walmart,

Paytm backed by Alibaba and Amazon pay backed by Amazon are the leading players in 2020<sup>1</sup>. Mobile wallets are now losing grounds after the introduction of united payment interface (UPI) in 2016. Through UPI users can transfer money directly to bank accounts which are linked with their respective mobile phone numbers. The service providers of wallets quickly integrated the UPI interface with their applications and Paytm also got its payment banking licence from RBI in 2019. However, Paytm is barred from extending credit similar to a traditional bank<sup>2</sup>. In 2021 mobile wallets and UPI are the most popular form of payment for in-store purchases with 33% followed by debit cards (20%) and credit cards (12%) respectively<sup>3</sup>.

Apart from having benefits such as user-friendly interface, security and low transaction fees; mobile payment adopting was boosted by two external shocks. These external shocks are demonetisation and the outbreak of SARS-coV-2.

The sudden explosion in the use of various mobile payment methods is evident from the figure 2.1. After demonetisation (Nov 2016) and the subsequent lockdown (Mar 2020) due to the corona virus pandemic has helped in the increasing use of these methods of payment. As explained earlier the use of UPI and mobile banking is the most popular form of payment.

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<sup>1</sup> History of digital wallets in India. <https://smebook.eu/knowledge-base/digital-wallet/history-of-digital-wallets-in-india/>

<sup>2</sup> <https://economictimes.indiatimes.com/industry/banking/finance/the-china-angle-that-could-hamper-paytms-forward-march/articleshow/87774896.cms?from=mdr>

<sup>3</sup> <https://www.financialexpress.com/industry/banking-finance/digital-wallets-emerge-second-most-popular-in-store-payment-method/2218021/>

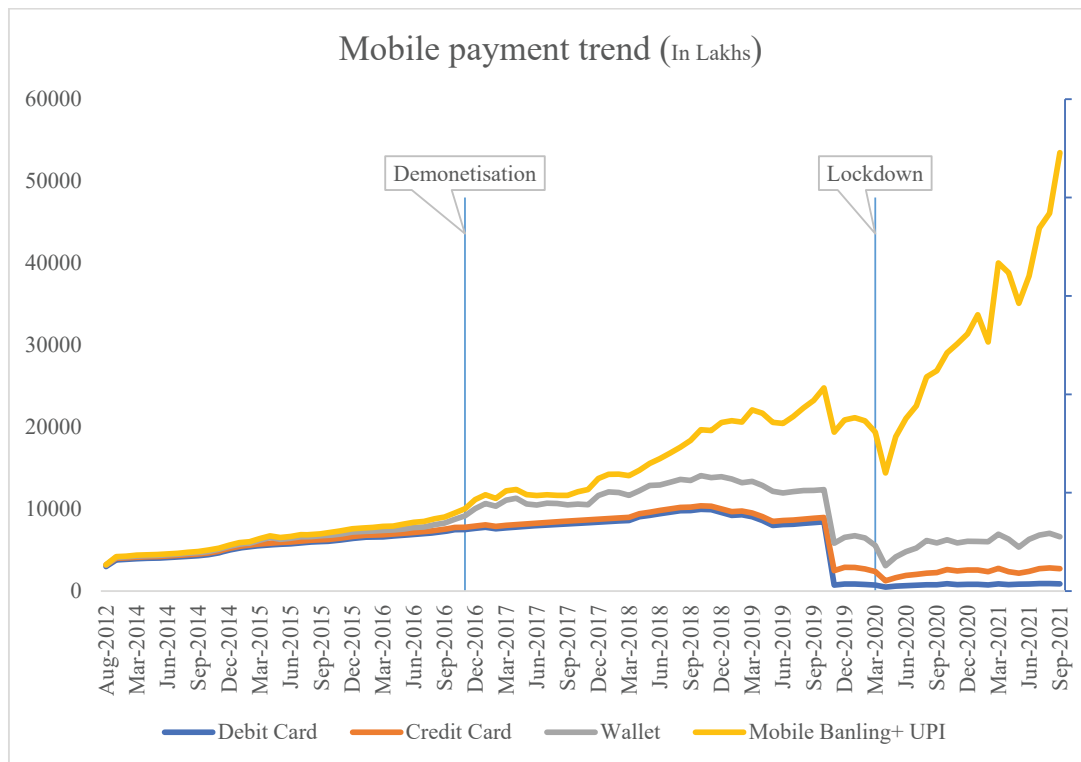


Figure 2.1 Mobile payment trends in India (values are in lakh)

Source: RBI 2021

The primary goal of literature review chapter is to identify the link between theory with empirical evidence and vice versa (Siddaway et al., 2019). The two broad types of literature reviews are the qualitative and quantitative nature of describing the existing studies. Qualitative reviews are the narration of the sequence in which the theory has progressed and is sometimes backed by empirical evidence. This method triumphs over the quantitative reviews in describing the rational for identifying and contextualising existing theories with recommendation for new theory development. But the major issues with qualitative reviews are their unsystematic nature and being prone to reviewers' bias. These biases are mainly due to accepting the empirical findings on face values without any criticism. Quantitative reviews

on the other hand offer a precise measure of the effect sizes by using statistical methods to correct the biases arising due to various artifacts present in empirical studies.

This study uses the best of both methods to overcome the shortcomings of each type of literature review. To describe the qualitative aspect of the existing studies narrative review is used and to explain the quantitative nature meta-analysis is preferred. Narrative review presents the gradual evolution of the theories of adoption along with the associated constructs in general while the section on meta-analysis presents a detail account of the constructs and their overall influence on the adoption/ continuance intention of mobile payments.

## **2.2. Narrative Review**

The explanation for human behaviour has been primarily studied in personality and social psychology disciplines. Personality based studies use traits while social psychologists use attitude to understand human behaviour. Traits and attitudes are latent constructs and can only be deduced from the observable characteristics of the individual (Heider, 1958; Jones & Davis, 1965; Kelley, 1987). Attitudes are relatively much easier to change than traits (Ajzen, 2005), hence for this study, we have focussed on theories and models that measure dispositional attitudes rather than a trait.

Before examining the factors responsible for a behaviour, it is pertinent to clearly define the adoption behaviour or intention, with the assumption that the decision-making process is influenced by the information available, belief system and past experiences. Individual behaviour also differs based on the demographic, culture and geographical factors (Fishbein & Ajzen, 2010, p. 41). The subsequent section in narrative review offers a comprehensive overview of the evolution of the various technology adoption models available in literature.

### **2.2.1. Search Strategy for Identifying Theoretical Models on Technology Adoption**

Two popular databases i.e., Web of science and Scopus were used to search for theory explaining technology adoption in the context of information and communication technology. The keywords used to search the relevant literature are as follows: theor\*, framework\*, models, antecedent\*, intent\*, information system, information and communication technology, ICT, Adopt\*. Wild card characters were used to account for the possible orthographic variation. The collected data was further analysed to identify the major theoretical themes and a network diagram of the is presented in figure 2.2 using the VOSviewer software (van Eck & Waltman, 2010).

The theoretical network suggests there are two major themes from the literature search. The first theme is on theories related to intention and the related factors which influence adoption, and the second theme represents information system theories on usage or performance measurement. This research focuses only on the theories which describe intention to adopt and avoids usage/performance theories due to the following reasons:

- a) The use of technology is not a latent construct as the usage patterns can be obtained from the system logs. Treating usage behaviour as any factors related to perception or belief would result in measurement error.
- b) Simultaneous measurement of intention and usage would result in increase of measurement context effect and introduces covariance in the observed relationship (Le et al., 2009). But measuring the two constructs over two separate time period reduces common method variance (Jarvis et al., 2003; Sharma et al., 2009; Venkatesh et al., 2012a).

- c) Temporal separation between measurement of intention and usage would make the intention susceptible to change and the behaviour would not correlate with the measured intention (Fishbein & Ajzen, 2010).

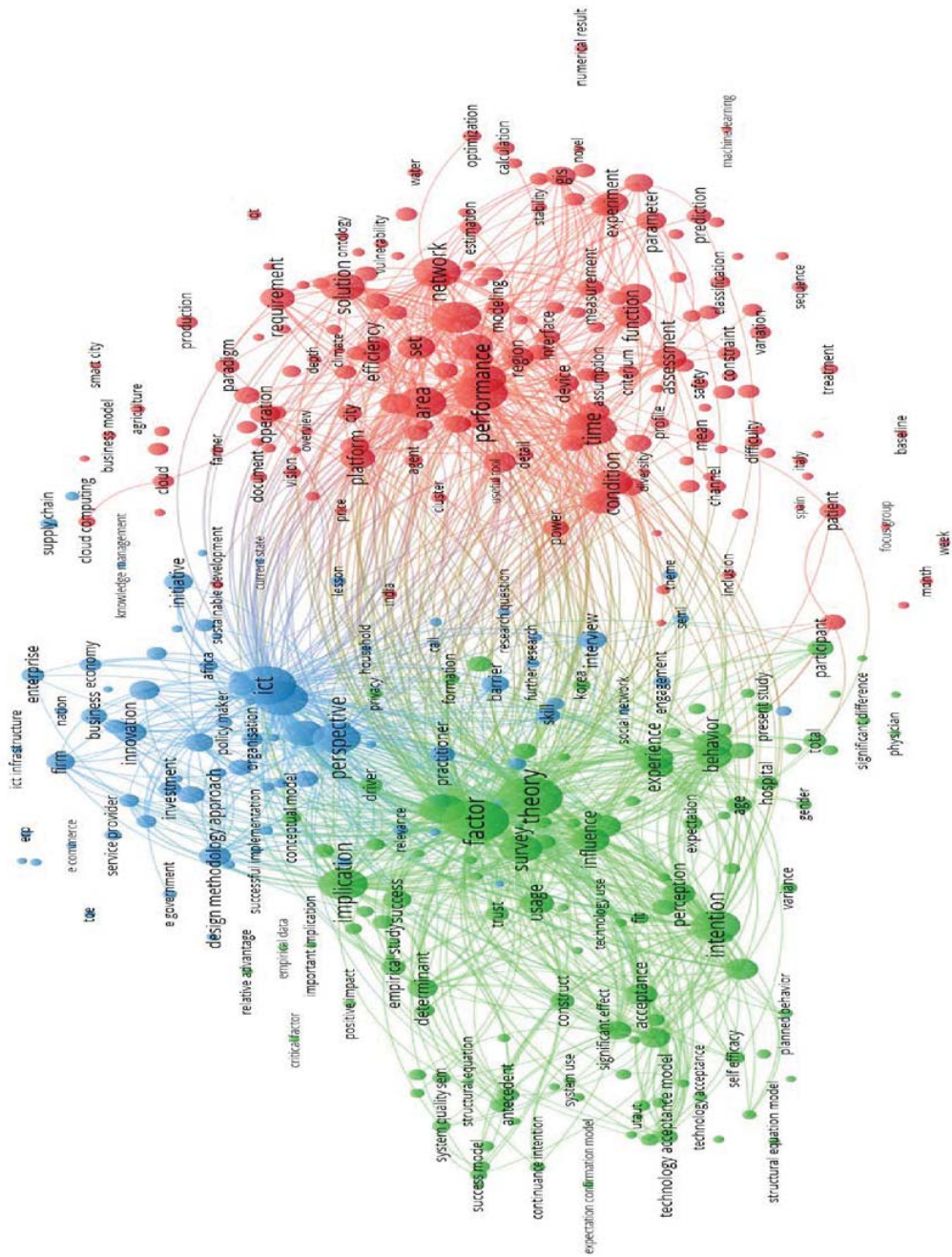


Figure 2.2 Theory network



### 2.2.2. Theory Of Reasoned Action (TRA)

Outcome of a decision making process i.e. behaviour is an observable event as needs four attributes namely action , target , context and time to understand social behaviour measured in the model (Fishbein & Ajzen, 2010).TRA proposes that in order to explain the dispositional behaviour, intention is the key construct. Intention is defined as the “*likelihood or perceived probability of performing a given behaviour* “(Fishbein & Ajzen, 2010). Intention to act is primarily dependent upon the belief system of an individual and is further split into behavioural beliefs and normative beliefs (Ajzen & Fishbein, 1975, 1980). Figure 2.3 is the graphical representation of the theory.

- **Subjective Norm**

Subjective norm is the user’s expectation of how the people associated with him would react to his actions and is delineated as “*person’s perception that most people who are important to him think he should or should not perform the behaviour in question*”(Ajzen & Fishbein, 1975, p. 302).

- **Attitude**

Dispositional attitude serves as the central construct in social psychology and is defined as “*an individual's positive or negative feelings (evaluative affect) about performing the target behaviour*” (Ajzen & Fishbein, 1975, p. 216). Attitude as a construct helps in the dispositional explanation of human behaviour in the field of social psychology (Ajzen, 2005). But, attitude like any other social psychology construct is latent in nature and can be inferred from the verbal, nonverbal and behaviour of an individual in a particular context (Jones & Davis, 1965; Kelley, 1973).



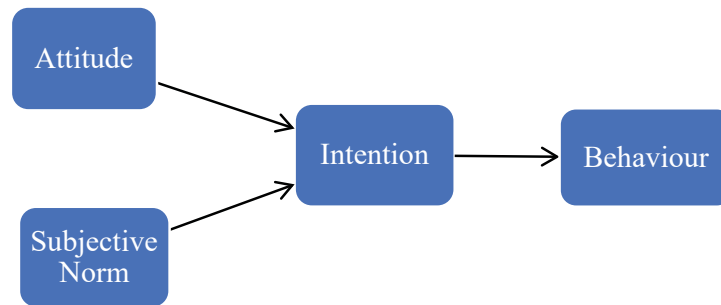


Figure 2.3 Theory of reasoned action (Ajzen & Fishbein, 1975)

### 2.2.3. Theory of planned behaviour

TRA is extended by including the belief for perceived behavioural control to explain for necessary resources and opportunities for performing the behaviour (Ajzen, Icek, 1985). This new model is named Theory of planned behaviour (TPA). Similarly, to the other beliefs the more resources an individual has it will have better behavioural control to perform the behaviour. Figure 2.4 presents the graphical representation of the theory. The indirect effect of behavioural control on the dispositional behaviour is based on the assumption of the motivational implication for behavioural intention (Madden & Ellen, 1992, p. 4).

TPA help to understand the motivational aspect which stems from the beliefs and its effect on behavioural intention /behaviour as well as the theory also forms the basis of various models to predict behaviour. These features help to identify the key areas to improve and formulate strategies to change or enhance the intention towards a product.

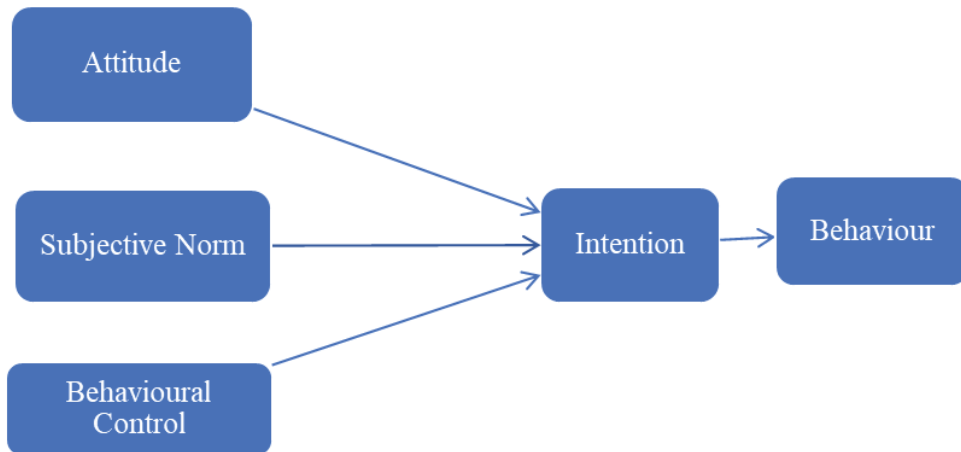


Figure 2.4 Theory of planned behaviour (Ajzen, Icek, 1985)

#### **2.2.4. Technology Adoption Model (TAM) And Its Modifications**

The model was developed by Davis (1985) to provide a theoretical foundation to improve the decision making process for technology adoption and design of the technology products before implementation. TAM was also intended to test the prototype on future users and measure their motivation for switching to new systems. TAM is based on the theoretical support from theory of reasoned action (Ajzen & Fishbein, 1980) and expectancy value theories (Ajzen & Fishbein, 1975). The model is depicted graphically in figure 2.5.

TRA model is extended by addition of two new variables, perceived ease of use (PEOU) and perceived usefulness (PU) to explain the attitude for behavioural intention. Subjective norm is not part of TAM as it was explained that for new technology adoption the user might not be able to anticipate the normative beliefs (Davis, 1985).

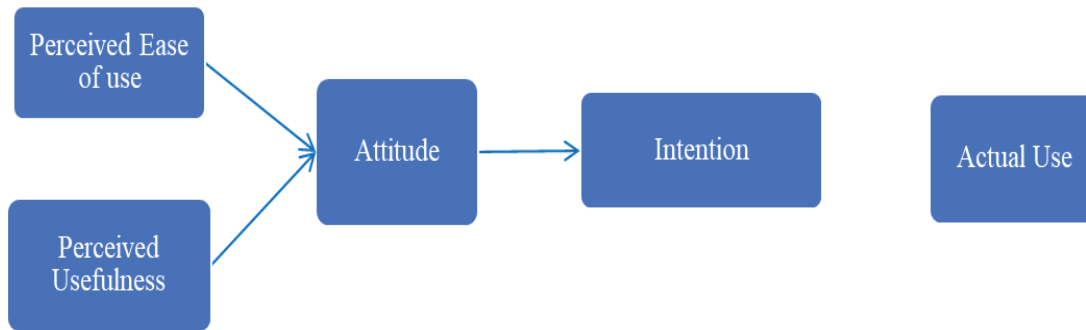


Figure 2.5 Technology adoption model (Davis, 1989)

Davis (1985, p. 27) delineated perceived usefulness as “*the degree to which an individual believes that using a particular system would enhance his or her job performance*” and perceived ease of use as “*the degree to which an individual believes that using a particular system would be free of physical and mental effort*”.

Lee et.al.(2003) identified the major limitations suffered by TAM were low variance scores, self-reported usage information and lack of credible usage data. The authors also identified majority of the studies were conducted on students which lacked proper representation. Similarly, when studies were conducted outside the student population only one homogenous group were selected in the empirical literature which were not representative in nature. These problems were addressed in the revised version of TAM.

Original TAM model was extended by including social influence process and cognitive instrumental process (Venkatesh & Davis, 2000). This second version of TAM is often referred

to as TAM2. Venkatesh et.al (2000) identified the variables associated with social influence are image, subjective norm, and voluntariness. The significance of subjective norm is affected by the mandatory or voluntary setting for information system adoption (Hartwick & Barki, 1994). These two factors are referred as compliance as it is dependent on the scenario for user's free will or mandatory adoption. Voluntariness is used as an moderating variable in TAM2 and defined as "*the extent to which potential adopters perceive the adoption decision to be non-mandatory*"(Hartwick & Barki, 1994; Moore & Benbasat, 1991; Prasad & Agarwal, 1997). TAM2 proposes that image will be positively influenced by subjective norm as individuals try to maintain a positive persona or image among the reference group (Kelman, 1958). The definition of image is "*the degree to which use of an innovation is perceived to enhance one's image or status in one's social system*"(Moore & Benbasat, 1991, p. 195).

Perceived usefulness is explained by four cognitive instruments namely result demonstrability, perceived ease of use, output quality and job relevance. These variables help to explain how the relationship between achievement of work goals are important for adoption of technology products. Job relevance is the mental assessment of how pertinent the new technology is for carrying out the task at hand and is defined as "*cognitive judgment that exerts a direct effect on perceived usefulness, distinct from social influence processes*" (Venkatesh & Davis, 2000, p. 191). While job relevance reflected the necessity of the technology to perform tasks, output quality measures the user's perception on the performance of the new technology. When the performance impact can be clearly understood through measured benefits that will help the prospective users to assess the job demonstrability. The definition for job demonstrability is "*tangibility of the results of using the innovation*" (Moore & Benbasat, 1991, p. 203).

### **2.2.5. Technological, Organizational and Environment Framework (TOE)**

The TOE framework proposed the three aspects of technology, organisation and the environment, required for the adoption of technology innovation in the organisation context (Tornatzky & Fleischer, 1990). The technology aspect describes the current technology used by the firm and the other technologies available, and their assessment helps to identify the limitation or opportunities for technological change, that can be undertaken (Collins et al., 1988; Hage, 1980; Thompson, 1967). The organizational aspect refers to the size, management structure, number of employees and the other available resources to measure the possible shift in change of technology and its impact on a firm's performance. The communication process in the organisation can also be a key criterion to assist or inhibit innovation (Tushman & Anderson, 1986). Industry regulation, possible suppliers of technology and competition are represented by the environmental aspect. The environment aspect is important in terms of providing a broad strategic outlook for the firms as the competition among rivals would require firms to invest in research that can increase the overall rate of innovation (Mansfield et al., 2008), securing resources to avoid supply-side shocks caused by the dominant players (Kamath & Liker, 1994)

### **2.2.6. Task Technology Fit (TTF) and Extensions**

The majority of theories study attitude as a predictor for utilisation, while TTF measures the performance of utilising the technology. Goodhue (1995) proposed that the necessary condition for a positive impact on performance due to ICT is ultimately dependent on the compatibility of features and tasks of the end-users. Floyd (1986, 1988) has found that “*system/work fit*” does

have a positive influence on the managerial use of information technology. graphical representation of TTF is presented in figure 2.6.

The constructs of TTF are defined by Goodhue & Thompson (1995, p. 216) are as follows :

- Technology is defined as “*tools used by individuals in carrying out their tasks*”.
- The task is delineated as “*the actions carried out by individuals in turning inputs into outputs*”
- Task technology fit is the “*degree to which a technology assists an individual in performing his or her portfolio of tasks*”

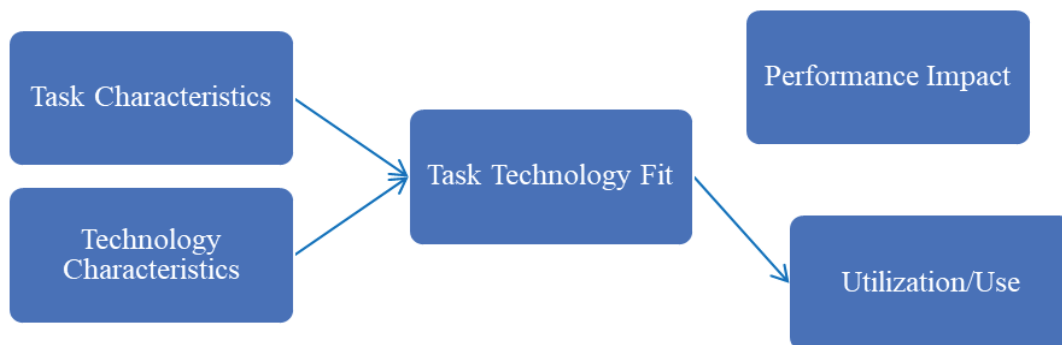


Figure 2.6 Task Technology Fit (Goodhue, 1995)

One of the limitations of TTF is the assumption of the voluntary use of the information system. In an organization use of technology is mandated by rules but individual use of technology outside the organization is primarily due to the users’ own volition. The second limitation is increased utilization of the information system does not warrant improved performances as a poor fit of information system and the task will always result in poor performances and the

major factors for use could be driven by social, habit, ignorance and availability (Goodhue & Thompson, 1995). To overcome these shortcomings, they proposed “*The technology to performance chain*” model Figure 2.7 represents technology to performance chain model. combining the utilization theories and TTF to explain utilization and performance impact. The model can be applied on voluntary use or mandated by an organization where the precursor to utilization can be derived from appropriate theories of behaviour and attitudes. The phenomenon of TTF on utilization can be explained as a direct effect and through the beliefs of the user which can predict utilization, this is mentioned as the link between TTF and expected consequences of utilization (Figure 2.7).

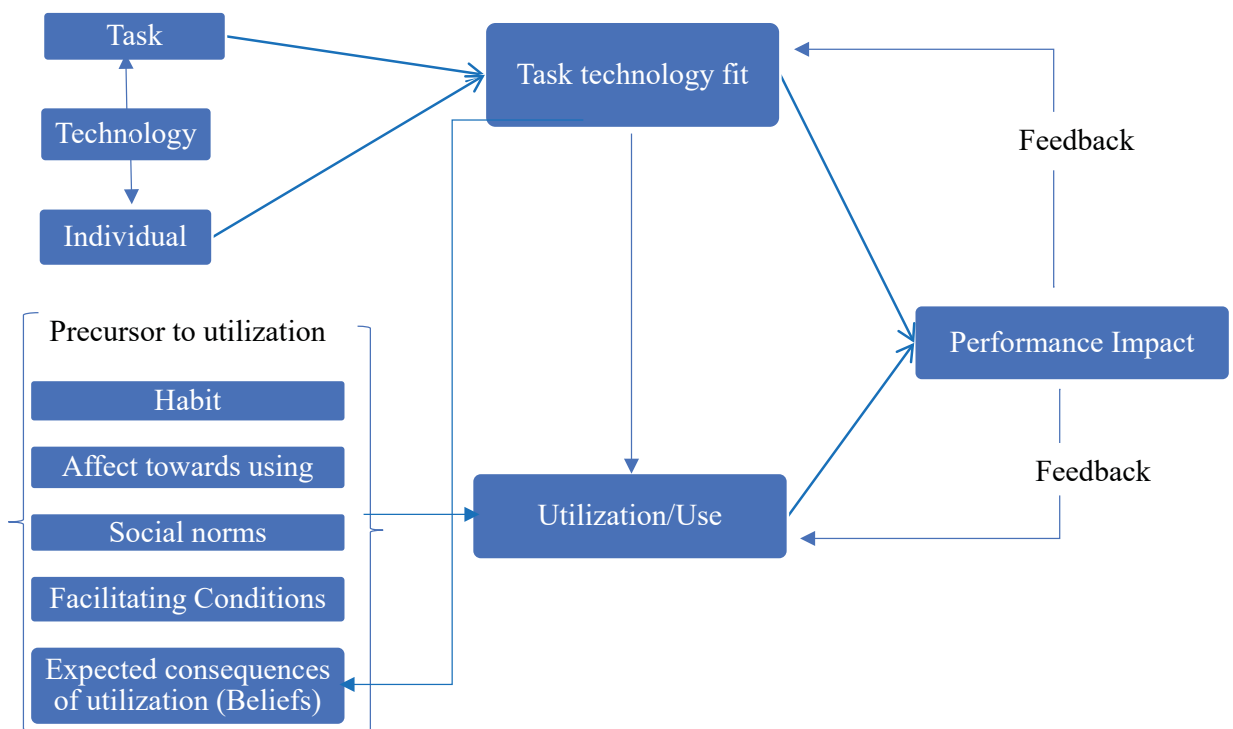


Figure 2.7 Technology to performance chain model (Goodhue & Thompson, 1995)

High TTF can increase the chances of utilisation and in turn can improve the performance impact which is the sum of efficiency, effectiveness, and quality. Feedback is the learnings for using the information system and can affect future utilisations. Empirical investigations have also found TTF model is able to dispositional behaviour. Oliveira et.al. (2014a) conducted a study to assess the impact on the performance of the users of mobile banking by integration of information and success model (Delone & Mclean, 1992) and TTF model . The authors found a significant effect of the information system characteristics along with the moderation effect of TTF for the usage and performance of an adopter of mobile banking.

### **2.2.7. The unified theory of acceptance and use of technology (UTAUT) And Its Extension**

The problem faced by information system researchers was due to the existence of multiple models with various antecedents to explain intention to adoption. Each model had some benefit over the other and combining a few different models to increase the explained variance in the adoption was even more challenging and often resulted in complex models. To address these concerns Venkatesh et al.(2003) studied 8 prominent theories and formulated a parsimonious model with four determinants and four moderating variables to explain user intention and called it the unified theory of acceptance and use of technology(UTAUT). These 8 models are theory of planned behaviour (TPB), theory of reasoned action (TRA), combined model of theory of planned behaviour and technology adoption model, model of PC utilization, technology adoption model (TAM), social cognition theory (SCT), motivational model and innovation diffusion theory. The analysis of 8 models resulted in four significant variables (performance expectancy, effort expectancy, facilitating conditions and social influence) but three (attitude, self-efficacy, and anxiety) of them were not direct antecedents of behavioural intention and



were removed from the final UTAUT model (Venkatesh et al., 2003). Figure 2.8 depicts the UTAUT model and associated factors and moderators to understand how intention is changed due to use of ICT.

- **Effort Expectancy**

An individual's decision to choose a specific method for accomplishing a task is not only dependent on the preference among the possible outcomes but also on the subjective evaluation of the outcomes derived from the beliefs or expectancy that has a higher probability of achieving the outcome (Tolman, 1999). This aspect is known as Tolman's behaviourism where the choice of method is dependent on the best possible outcome (Vroom, 1964, p. 18). Vroom's expectancy-value theory explains the intention of an individual to act a certain way is primarily guided by the attractiveness and probability of an outcome and effort will be given to achieve the desired outcome (Snead & Harrell, 1994). Effort expectancy has similarity with perceived ease of use, complexity and is defined as the "*degree of ease associated with the use of the system*". (Venkatesh et al., 2003, p. 450)

- **Performance Expectancy**

Expectancy theory as explained in the previous section helps to explain the effort that might be necessary to achieve a certain outcome. Effort expectancy thus sets the expectation for the achievement of tasks and further scope for performance improvement.

Perceived usefulness, extrinsic motivation, job-fit, job advantage and outcome expectation reflect the essence of performance expectancy which is defined as the "*degree to which an individual believes that using the system will help him or her to attain gains in job performance*" (Venkatesh et al., 2003, p. 447).

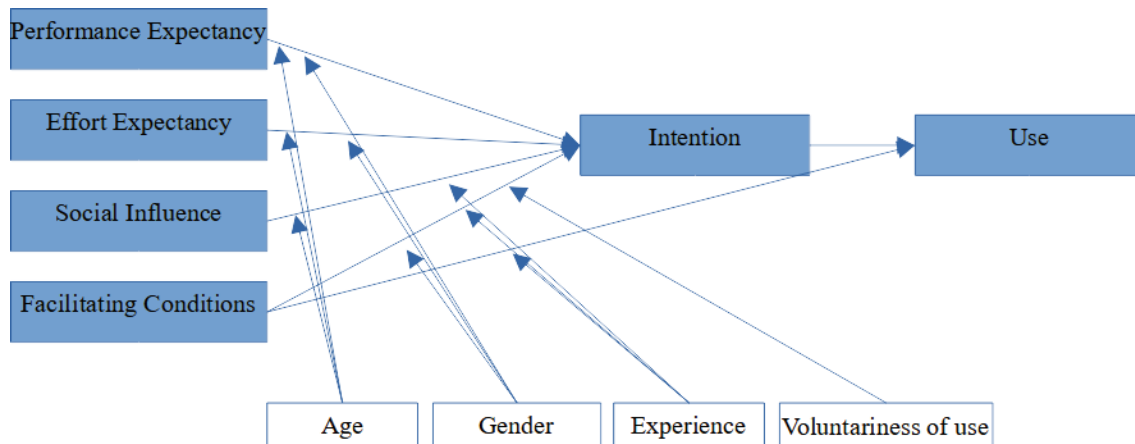


Figure 2.8 UTAUT (Venkatesh et al., 2003)

- **Social Influence**

Normative belief dictates behaviour towards technology adoption which will satisfy or is in agreement with the expected behaviour of the people who are associated with an individual (Karahanna et al., 1999). Innovation diffusion theory proposed social influence plays a critical role in the diffusion of any innovation but are largely ignored in research to study adoption behaviour (Rogers, 1962). Social influence can be categorised into two types namely, informational influence and normative influence. Information influence takes prominence when the information presented is accepted as reality by an individual while normative influence moulds the user behaviour to conform with the approval of other individuals (Bearden et al., 1986; Burnkrant & Cousineau, 1975). Social influence can affect decision making through the process of internalisation, identification and compliance (Kelman, 1961). Internalisation helps the user to accept the information if it comes from a credible source. the user perceives the utility of the information to enhance knowledge. Identification is the acceptance of the information source and its relevance while compliance is a normative belief

where the user is aware of the action and how it will be perceived by the people around him/her. These actions are undertaken to keep in mind the perceived negative and positive consequences.

Social influence is similar to the subjective norm, social influence, social factor and image and is defined as the “*degree to which an individual perceives that important others believe he or she should use the new system*”. (Venkatesh et al., 2003, p. 451)

- **Facilitating Conditions**

The adoption decision is not entirely dependent on an individual’s belief and other internal factors but also on the external factors which may affect the intention. Facilitating condition captures the external factors which may help or prevent adoption, but facilitating condition cannot account for all the external factors (Venkatesh et al., 2008). In an effort to capture the non-volitional effect of the external factors, facilitating condition was introduced into the theory of planned behaviour (Ajzen, 1991; Mathieson, 1991) and the personal computer utilization model (R. L. Thompson et al., 1991, 1994).

Facilitating conditions resembles perceived behavioural control and compatibility. Venkatesh et al (2003, p. 453) defined facilitating condition as the “*degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system*”

UTAUT has been used extensively to study the adoption behaviour of computers (Al-Gahtani et al., 2007), mobile banking (Lau & Tan, 2016; Oliveira et al., 2014a), enterprise systems (Sykes et al., 2014). Most of the research on technology adoption was conducted in an organizational context with the increasing use of technology in consumer space an appropriate

model was needed to explain the adoption behaviour. To improve the theoretical contribution in the consumer context an extended version of UTAUT was proposed by including three additional constructs (Venkatesh et al., 2012b). Figure 2.9 shows the addition of hedonic motivation, price value and habit to the UTAUT model for explaining the adoption of general-purpose technology in a consumer context, this new model was named UTAUT2.

- **Hedonic Motivation**

Hedonic motivation is defined as “*the fun or pleasure derived from using a technology*” (S. A. Brown & Venkatesh, 2005). The hedonic aspect of an information system is significantly weaker compared to the perceived usefulness and perceived ease unless the primary objective of the technology is solely to get pleasure out of it (Adams et al., 1992). These products with a specific emphasis on enjoyment are termed hedonic products and offer self-fulfilling value over utility and are driven by intrinsic motivation as enjoyment is derived by using the system. A study conducted on users of a Dutch movie website found significant to affect the intention which was a better predictor over perceived ease of use and usefulness (Heijden, Der, 2004). Hedonic motivation has its theoretical foundation based on use and gratification theory (Trowbridge, 1976). This theory used four constructs namely utilitarian gratification, technology gratification, hedonic gratification and social gratification to explain the intention to use an information system offering. (Gan & Li, 2018) conducted a study on 297 Chinese users of an instant messaging application and found a significant effect of utilitarian, hedonic and technology gratification on the intention.

The hedonic aspect of technology use can also have a negative impact on the continuance over a period of time, these studies are categorised as information system discontinuance. The primary driver for discontinuing the use of a technology product is guilt

which can negate the effect of satisfaction and habit. The predictors associated with information continuance can also be used to study discontinuance as low levels for intention to continue can be assumed to favour discontinuance (Turel, 2014). The cognitive evaluation of a process results in confirmation, where a higher confirmation drives satisfaction and continuance intention and low confirmation results in dissatisfaction and discontinuance (Bhattacharjee, 2001)

- **Price Value**

Price can be closely linked with perceived quality for evaluation of value for a product and service, where quality represents the relative superiority of the offering (Zeithaml, 1988). Higher price can be associated with a higher degree of quality and which in turn can increase the willingness to purchase but, a higher price also warrants a monetary sacrifice which in turn can decrease the willingness to purchase (Dodds et al., 1991). This paradoxical situation was applied to commodities where the attractiveness of the offering is increased due to lower price (Scitovszky, 1944).

The intangible nature of service represents quality and affects the perceived value in an adoption model (H. Kim et al., 2013). Price value is defined as the “*consumers' cognitive trade-off between the perceived benefits of the applications and the cost for using*” (Dodds et al., 1991, p. 308). While price value might not affect the adoption decision in an organizational setting, but it can play an important role for voluntary adoption in the consumer setting, as the user has to pay for the technology.

The study on WiMAX users of Korea suggests that lower prices can have a positive impact on continuance intention (H. Kim et al., 2013). Similar findings are also reported by

Chan et al. (2008) where perceived cost-effectiveness has a significant impact on intention to adopt short messaging service (SMS) among the user of China and Hong Kong.

- **Habit**

Schema/ta are structures that store knowledge about certain objects or topics. The structures stored in memory are not only to a specific experience but also to the characteristics of those experiences. These schemas have the ability to describe the consumer's behaviour (Erasmus et al., 2002). In a situation where individuals are overburdened with too much information, these schemas stored in memory helps to focus on limited information and help in decision making (Schurr, 1986). These learnings can further help to form a habit. Habit is defined as “*the extent to which people tend to perform behaviors automatically because of learning*”, and forms due to behavioural patterns (Limayem et al., 2007, p. 705).

A study on 1067 German travellers who use mobility as a service, found a significant effect of habit on the behavioural intention to adopt the technology. This study highlighted the congruence of habit and schema and how it can enrich the adoption theory to explain for intention to adopt a technology (Schikofsky et al., 2020). Expectation confirmation theory was used to study the adoption behaviour of blogs using a survey of 430 users and found no significant relationship between the habit and adoption intention, but the study identified the hedonic motivation as the primary driver for adoption of blogs (Shiau & Luo, 2013). The possible reason for habit not being a significant predictor can be explained by self-perception theory (Bem, 1972), as users frequently reevaluate their enjoyment due to the discovery of new information from blogs but habit is the act of browsing through various blogs for the search of new information which increases the enjoyment once the new information is found but the process itself is not enjoyable.

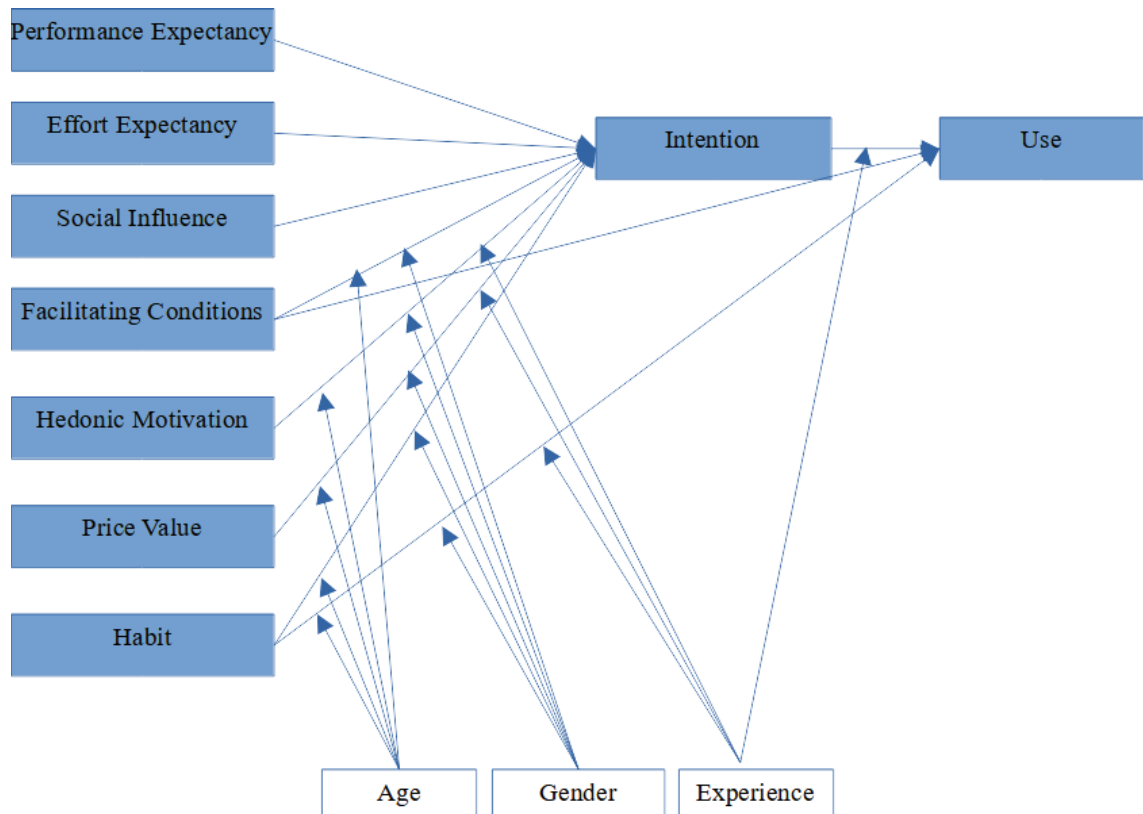


Figure 2.9 UTAUT2 (Venkatesh et al., 2012b)

### 2.2.8. Other Constructs

- **Culture**

Hofstede (1980) proposed that national culture helps to shape the values shared by the members of the society and the leading theory to explain the national culture is Hofstede’s cultural dimensions typology. The author defined national culture as the “*collective programming of the mind which distinguishes the members of one human group from another*” (Hofstede, 1980, p. 18). Five dimensions of national culture were identified, namely: uncertainty avoidance, power distance, masculinity, individualism, and long-term orientation uncertainty avoidance. Studies have found varying adoption levels of information technology in different countries

which can be attributed to the national culture prevailing in those countries (Krishnan & AlSudary, 2016; Veiga et al., 2001). The literature on culture can primarily be divided into 6 themes which are culture and IT development; culture, IT and diffusion; culture, IT and outcomes; culture, IT management and strategy; IT's influence on culture and IT culture (Leidner & Kayworth, 2016). Among these themes on culture, IT and diffusion have received the least amount of attention.

Al-Gahtani et al.(2007) explored the adoption behaviour for the use of computers in Saudi Arabia and found a significant effect from performance expectancy and social influence but a decrease in social influence is also observed with increasing age and experience. The authors explain this phenomenon due to high power distance and low individualism Risk

Risk is defined as a “*consumer’s subjective belief of the possibility of loss or harm from installing an application*” (Dinev & Hart, 2006, p. 63; Ganesan, 1994; Kim & Koo, 2016). Online payment can be characterised by impersonal nature and implicit uncertainty over an open network. These characteristics can give rise to environmental and behavioural uncertainty (Bensaou & Venkatraman, 1996).

Behavioural uncertainty can arise if there exists a chance to take undue advantage due to the impersonal nature of the online transaction and the non-existence of a regulatory framework. Environmental uncertainty can be attributed to the external forces that can disrupt the services even if the organisation has taken the necessary steps to mitigate these risks. The significant factor contributing to environmental risk is the open nature of the internet and poses some inherent risk to conducting an online transaction (Pavlou, 2003).



- **Trust**

Trust is defined as “*the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party*” (Mayer et al., 1995). A higher level of trust offers an opportunity to maximise gain while lower levels help to avoid potential loss (Camp, 2002, p. 3).

For a successful mobile payment operation, it is necessary to have the perception of trustworthiness, reliability and dependability among potential consumers. The existing concerns of mobile payment’s vulnerability to intrusion is a significant factor and is expected to have a long term effect (Hanafizadeh et al., 2014; H. Lee et al., 2015). The extant literature mentions ease of use, utilitarian interface design has a positive influence on trust (Chien et al., 2012). In the Indian context perceived trust has a significant effect on the adoption of mobile payment among merchants (N. Singh & Sinha, 2020)

- **Privacy**

Individuals’ willingness to share personal information is contingent upon the economic and social benefit under the privacy calculus. Privacy calculus or calculus of behaviour suggests that the information gathered would seem less invasive if the following conditions are met (Culnan & Armstrong, 1999; Laufer, Robert and Wolfe, 1977):

- a) Existence of a prior relationship before the information is sought
- b) User is under the perception that he/she can have control over future information use
- c) The information collected is relevant to the transaction, and

d) Information will be used to draw correct inferences about their behaviour

The main motivation of the users to share personal information with organizations are the expectation of better customer service, offering of new and high-quality products rather than the aspect of financial benefit. While the organization's rationale is to identify the specific needs of its consumers (Blattberg & Deighton, 1991; Glazer, 1991). The research on privacy is mostly focused on the interpersonal aspect of the user and the firm rather than impersonal relationships. The impersonal aspect of a transaction would open more avenues to understand human behaviour when it comes to privacy. Privacy has been found to have a significant effect on adoption (Culnan & Armstrong, 1999).

- **Perceived Security**

Inadequate security for personal and financial data could hamper the adoption of a technology product. The multidimensional nature of perceived security can be explained by four sub-dimensions namely, confidentiality, integrity, availability, and non-repudiation (Hartono et al., 2014). A system with a higher level of confidentiality will prevent unauthorised access to user information. Access to the data can be prevented using an advanced encryption algorithm. Confidentiality is defined as the "*prevention of unauthorized parties to capture, interpret or understanding data*" (Tsiakis & Sthephanides, 2005, p. 11). Information systems have checksums or hash algorithms to prevent errors in the data are helps to preserve data integrity during storage and transmission. Integrity is the "*assurance that data have not been altered or manipulated by unauthorized parties*" (Tsiakis & Sthephanides, 2005). The information system should have the ability to provide information whenever desired by the user can is possible by implementing backup systems and fault-tolerant systems to withstand security attacks (Denial of service, distributed denial of service). Availability is defined as "*continuously and*

*uninterrupted provision of services*” (Tsiakis & Sthephanides, 2005, p. 11). Non-repudiation is to assess the authenticity of the valid transaction conducted between the user and the service provider. This can be achieved by using digital signatures. It is defined as “*prevention of denying the action of participating into a transaction by a person or entity*” (Siponen & Oinas-Kukkonen, 2007; Tsiakis & Sthephanides, 2005, p. 11).

Perceived Security is defined “*as the extent to which one believes that the World Wide Web is secure for transmitting sensitive information*” (Salisbury et al., 2001). Perceived web security has been studied in a combination of TAM to predict the intention to adopt online banking (Cheng et al., 2006). Similarly, perceived security along with innovativeness, privacy, product involvement, products are significant factors for determining attitude towards online shopping (Lian & Lin, 2008).

### **2.3. Meta-Analytic Review**

The process of theory building starts with the careful analysis of existing theories and relevant empirical literature to explain the desired phenomena. In the previous section where the narrative review was used to analyse the existing model now the focus shifts on synthesising the empirical literature available to better understand how we can improve our understanding of mobile payment adoption. Meta-analysis is a robust quantitative tool that allows us to produce an overall effect size. Meta-analysis offers some benefit when it comes to making an informed decision on the variables that can have an influence on the desired outcome. Artifacts like sampling error, measurement error, dichotomization of the dependent variable, range restriction, etc. can be corrected to obtain the true correlation in meta-analysis where narrative review just accepts the reported values without any modifications. In this study, it has been

observed that the empirical literature available suffers from sampling and measurement errors and needs modifications to obtain values close to the true effect size.

### **2.3.1. Search Strategy for Empirical Studies on Mobile Payment**

Scopus and Web of science are the two databases that were used to look for empirical evidence in mobile payment using the keywords with wildcard characters. The search was limited up to 31st December 2020. Additional search methods like hand-searching citations of authors with a special contribution in adoption literature (especially technology adoption) and systematic reviews to augment the search process. The following keywords were used to identify literature on the adoption of mobile payments: Mobile payment\*, mobile bank\*, mobile transfer\*, internet bank\*, intention\* and adopt\*. Additionally, Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines were followed. After searching from the databases with the help of keywords, 1473 articles were found. After the removal of duplicate records and careful examination of the abstracts, the list was further reduced to 980 records. Upon further examination of the individual articles, 78 articles were finally chosen for the meta-analysis. These articles can be segmented into journal articles (87%) and conference proceedings (13%). The study eligibility criteria are discussed in section 2.2.2.

### **2.3.2. Study Eligibility**

The meta-analytic review included studies with the following criteria:

- a) The review includes journal or conference articles that are published in mobile payment adoptions.
- b) The behavioural outcome measured in the study must be on the intention to adopt or continue using mobile payment.

- c) The articles must report the correlation values between the constructs along with reliability values associated with the constructs used.

Details on the inclusion and exclusion criteria are mentioned in table 2.1

Table 2.1 Inclusion and exclusion criteria for meta-analysis

<b>Decision Metrics</b>	<b>Inclusion Criteria</b>	<b>Exclusion Criteria</b>
Study Type:	Only surveys are included (peer-reviewed journal and conference articles)	Literature review and experimental studies are excluded
Population:	Respondents of 18 years of age and above are included	Respondents below 18 years are not included
Behavioural Outcome:	Only studies using intention as the behavioural outcome are included	Studies with attitude and usage behavior are excluded
Language:	Only English language studies are included	Other international languages are excluded from the review

### **2.3.3. Study Characteristics**

79 empirical papers are selected for meta-analysis based on the inclusion criteria discussed earlier. The selected studies are presented in table 2.2 to offer an overview of the methodologies, sample size, popular theories, variables and the gaps existing in the empirical literature.

Table 2.2 Summary of empirical studies

Author	Country	Technology	Methodology	Model/Theory	Sample Size	Variables used in the study	Significant Variables	Gaps
Chin et.al. (2020)	USA	Mobile Payment	PLS-SEM	Valence framework	234	Perceived benefit, Trust, Risk	Trust	Younger respondents
Lee et.al. (2020)	Malaysia	Wearable payment	PLS-SEM	TAM	307	Perceived usefulness, Perceived ease of use	Perceived usefulness	Cross sectional dataset Does not offer a comprehensive overview due to non-inclusion of social influence, convenience, perceived risk
Flavian et.al. (2020)	USA + Spain	Mobile Payment	PLS-SEM	TAM	794	Perceived usefulness, Perceived ease of use, subjective norms	Perceived usefulness, Perceived ease of use, subjective norms	Only online data was used instead of both online and offline

Chung et.al. (2020)	Taiwan	Mobile Payment	PLS-SEM	IDT	348	Perceived complexity, Risk	Perceived complexity, Risk	Only online data was used Only factors related to consumer resistance were studied
Al-Saedi et.al. (2020)	Oman		PLS-SEM	UTAUT	436	Performance Expectancy, Effort Expectancy, Social Influence, Trust, Risk, Cost, Perceived self efficacy	Performance Expectancy, Social Influence, Effort Expectancy, Trust, Cost, Perceived self-efficacy	Literature review was not conducted using scientific database (web of science, Scopus etc.)
Abayomi et.al. (2020)	China	Mobile Banking	Multiple Regression		425	Coercive Pressure, Normative Pressure, Mimetic Pressure, Risk	Coercive Pressure, Mimetic Pressure	Only student population was studied
Arif et.al. (2020)	Pakistan	Mobile Banking	CB-SEM		300	Value, Risk, Image, traditional barrier	Value, Risk, Image	Nonuser data was not used for the study

Pu et.al. (2020)	China	Mobile Payment	PLS-SEM	TAM	166	Perceived ease of use, Perceived usefulness, Trust	Perceived usefulness, Trust	Only users of one service provider (apple pay) were studied
Wang (2019)	Taiwan	Mobile Payment	CB-SEM	TAM	418	Perceived self-efficacy, Perceived Benefit, Risk	Perceived self-efficacy	The majority of the sample (63%) consists of women and is not representative of the population
Verkijika (2020)	South Africa		PLS-SEM	Social-Cognitive Theory (SCT)	325	Perceived self-efficacy, Perceived Norm	Perceived self-efficacy	Low variance explained (38.5%)
Zhang et.al. (2019)	China		CB-SEM		252	Perceived security, Perceived behavioural control	Perceived security	The study does not include external factors in the model
Albashrawi et.al. (2019)	USA	Mobile Payment	PLS-SEM	TAM	486	Perceived usefulness, Perceived ease of use, Satisfaction	Perceived usefulness, Perceived ease of use, Satisfaction	self-reported data



Crabbe et.al. (2009)	Ghana	Mobile Banking	Multiple Regression	TAM	271	Facilitating Conditions, Perceived usefulness, Perceived ease of use, perceived credibility	Facilitating Conditions, perceived credibility	Factors such as satisfaction or hedonic motivation are not studied
Jebarajakirthy (2021)	South Africa	Mobile Banking	CB-SEM	Social-Cognitive Theory (SCT)	325	Hedonic Motivation, Perceived Security, convenience	Hedonic Motivation, convenience	A cross-sectional dataset is used
Rahi et.al. (2020)	Pakistan	Internet Banking	PLS-SEM		500	Satisfaction, Image	Satisfaction, Image	Cross sectional dataset is used
Picoto (2020)	Brazil + India + UK + USA	Mobile Banking	Multiple Regression		208	Performance Expectancy, Facilitating Conditions, Perceived usefulness, Risk, Perceived Credibility, Culture	Perceived Credibility, Culture	self-reported questionnaire

Cabanillas et.al. (2020)	Spain	P2P Mobile payment	PLS-SEM	TAM	701	Hedonic Motivation, Perceived usefulness, Perceived ease of use, Trust, Innovativeness, Perceived Norm	Perceived usefulness, Perceived Norm, Innovativeness	Variables like experience, habits, and customization were not included Cross Sectional data
Phuong et.al (2020)	Vietnam	Mobile Payment	PLS-SEM	TAM	276	Perceived usefulness, Perceived ease of use, Trust	Perceived usefulness, Perceived ease of use, Trust	Variables like structural assurance, service quality, efficacy, and Expectancy
Rehman et. al. (2019)	Pakistan	Mobile Banking	PLS-SEM	TAM	384	Perceived usefulness, Perceived ease of use, risk	Perceived usefulness, Perceived ease of use	cross-sectional survey design
Foroughi et.al. (2019)	Malaysia		PLS-SEM	TAM	369	Perceived usefulness, Perceived ease of use, Satisfaction, Perceived self-efficacy	Perceived usefulness, Satisfaction, Perceived self-efficacy	Respondents belong to the age group of 20-40
Suhartanto et.al. (2019)	Indonesia	Mobile Banking	PLS-SEM	TAM	300	Perceived usefulness, Perceived ease of use, Satisfaction	Perceived usefulness, Perceived ease of use	Data was collected from a particular religious group

Alkhalidi et.al. (2019)	Saudi Arabia	Mobile Banking	CB-SEM	UTAUT	389	Performance Expectancy, Effort Expectancy, Risk, Perceived Cost	Performance Expectancy	Small female representation (13.6%)
Elhajjar et.al (2019)	Lebanon	Mobile Banking	CB-SEM	TAM + IDT	320	Perceived compatibility, Perceived usefulness, Perceived ease of use, Risk, Innovativeness	Perceived usefulness, Perceived ease of use, Risk, Innovativeness	Variables like habit and social influence were not included in the model
Baabdullah et.al (2019)	Saudi Arabia	Mobile Banking	CB-SEM	TAM + TTF	320	Task Characteristics, Technology Characteristics, Task Technology fit, Price value, perceived security, Perceived ease of use	perceived security, perceived usefulness, Task Technology fit	The moderating effect of demographic variables was not tested
Gupta et.al (2019)	India	Mobile Banking	CB-SEM	UTAUT	660	Performance expectancy, Effort expectancy, social influence, Facilitating conditions, Perceived Credibility	Performance expectancy, social influence, Perceived Credibility	Variables like hedonic motivation and risk were not included

Wiese et.al (2019)	South Africa	Mobile Payment	CB-SEM	TRI + ECM	426	Perceived compatibility, Perceived usefulness, Perceived ease of use, Risk, Innovativeness, Cost, Satisfaction	Perceived compatibility, Perceived usefulness, Perceived ease of use, Satisfaction	convenience sampling technique was used
Lee et.al (2019)	South Korea	Mobile Payment	CB-SEM	UTAUT	528	Performance Expectancy, Effort Expectancy, Social influence, Facilitating Conditions, Risk	Performance Expectancy, Social influence	The moderating effect of demographic variables was not undertaken
Zhang (2018)	China	Mobile Payment	CB-SEM	TAM	180	Perceived security, Perceived compatibility, Perceived usefulness, Perceived ease of use	Perceived security, compatibility	only female sample is used in the dataset
Gupta et.al (2017)	India	Mobile Banking	CB-SEM		176	Risk, Perceived behavioural control	Risk, Perceived behavioural control	A small sample size was used (176)

Kalaiarasi (2017)	India	Mobile Banking	CB-SEM	TPB + IDT	345	Relative advantage, Perceived compatibility, Perceived trialability, Perceived complexity, Risk, Self-efficacy	Relative advantage, Perceived compatibility, Perceived trialability, Perceived complexity, Self-efficacy	Factors like habit and social influence were not included in the model
Puriwat et.al. (2017)	Thailand	Mobile Banking	CB-SEM	TAM	348	Perceived usefulness, Perceived ease of use, Service Quality	Perceived usefulness, Perceived ease of use	cross-sectional sample and the moderating effect of demographic variables were not tested
Makanyeza (2017)	Zimbabwe	Mobile Banking	CB-SEM	TAM + IDT	232	Social influence, Facilitating conditions, Relative advantage, Perceived compatibility, Perceived trialability, Perceived complexity, Perceived ease of use, Perceived usefulness, Risk, Self-efficacy	Facilitating conditions, Perceived ease of use, Perceived compatibility, Perceived trialability	Cross sectional dataset is used

Raza et.al. (2017)	Pakistan	Mobile Banking	PLS-SEM	TAM	300	Perceived compatibility, Perceived ease of use, Perceived usefulness, Risk	Perceived compatibility, Perceived ease of use, Perceived usefulness, Risk	Non-consumer's behaviour was not studied. The influence of culture was also not included in the model.
Baptista et.al. (2017)	Brazil	Mobile Banking	PLS-SEM	UTAUT 2	326	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Hedonic Motivation, Price Value, Habit	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Hedonic Motivation, Price Value, Habit	Biased user sample
Al Khasawneh et.al. (2017)	Jordan	Mobile Banking	PLS-SEM	TPB	404	Social influence, Facilitating conditions, Relative advantage, Perceived compatibility	Relative advantage, Perceived compatibility	cross-sectional survey design
Ozturk et.al. (2017)	USA	Mobile Payments	CB-SEM		412	Perceived compatibility, Risk	Perceived compatibility, Risk	hedonic benefits, social norms, usefulness was not included in the study

Wirthe et.al. (2017)	Germany	Mobile Payment	PLS-SEM	Push + Pull	267	Perceived usefulness, Perceived ease of use	Perceived usefulness	Cross sectional dataset is used
Ramos-de-Luna et.al. (2016)	Spain	Mobile Payment	PLS-SEM	TAM	191	Perceived security, Perceived compatibility, Perceived usefulness, Perceived ease of use, Innovativeness, Perceived Norm	Perceived compatibility, Perceived usefulness, Innovativeness, Perceived Norm	cross-sectional survey design
Morosan et.al. (2016)	USA	Mobile Payments	PLS-SEM	UTAUT 2	794	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Hedonic Motivation, Habit, Perceived security	Performance Expectancy, Social influence, Hedonic Motivation, Habit	Intention was used as a surrogate for actual usage Cross sectional dataset is used

Yuan et.al. (2016)	China	Mobile Banking	CB-SEM	TAM+TTF+ECM	434	Satisfaction, Task technology fit, Perceived ease of use, Perceived usefulness	Task Technology fit, Perceived ease of use, Perceived usefulness, Satisfaction	Moderate variance explained (53.5%),  Representational sample of Malaysian consumers were not used
Kassim et.al. (2015)	Malaysia	Internet Banking	PLS-SEM	TAM	413	Perceived ease of use, Perceived usefulness, Risk	Perceived usefulness, Risk	Representational sample of Malaysian consumers were not used
Zhou et.al. (2010)	China	Mobile Banking	CB-SEM	UTAUT+TTF	250	Performance Expectancy, Effort Expectancy, Social influence, facilitating conditions, Task Characteristics, Technology Characteristics, Task Technology fit	performance expectancy, task technology fit, social influence, and facilitating conditions	Theories like perceived value theory could have been used in the model and inclusion of variables such as cost and trust could also have been explored.
Nan et.al. (2020)	South Korea	Social Mobile Payments	CB-SEM	TAM	205	Perceived security, Perceived ease of use, Perceived usefulness, Satisfaction, Enjoyment	Perceived usefulness, Satisfaction, Perceived security, Enjoyment	Moderate sample size was used (205), Sample consists of university students



Lin et.al. (2020)	Taiwan	Mobile Payment	CB-SEM	CBT	302	Price Value, Relative advantage, Perceived compatibility, Risk, Perceived Norm, Image	Price Value, Perceived Norm, Image	Survey responses were obtained using online mode, Qualitative analysis is not conducted
Chen et.al (2019)	Taiwan	Mobile Payment	CB-SEM	SOR	425	Hedonic motivation, Satisfaction	Hedonic motivation, Satisfaction	cross-sectional survey design
Foroughi et.al. (2019)	Malaysia	Mobile Banking	PLS-SEM	TCT	369	Perceived ease of use, Perceived usefulness, Satisfaction, Self-efficacy	Perceived usefulness, Satisfaction	Majority of the sample is from age 20-40
Rahi et.al. (2019)	Pakistan	Inter Banking	PLS-SEM	UTAUT	398	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions	UTAUT2 Could have been used instead of UTAUT

Hong (2019)	South Korea	Mobile Banking	CB-SEM	SCT+ID T	751	Perceived security, Perceived ease of use, Perceived usefulness, Innovativeness, Self-efficacy, Perceived behavioural control	Perceived security, Perceived ease of use, Perceived usefulness, Innovativeness, Self-efficacy, Perceived behavioural control	The effect of culture was not included in the study
Siyal et.al (2019)	China	Mobile Banking	PLS-SEM	TAM	129	Perceived ease of use, Perceived usefulness, Risk, Perceived Benefits	Perceived ease of use, Perceived usefulness, Perceived Benefits	Non-account holders were not studied, Moderating effects of demographic variables were not included, Cross-sectional design
Kwateng et.al. (2019)	Ghana	Mobile Banking	PLS-SEM	UTAUT 2	300	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Hedonic Motivation, Price Value, Habit	Price Value, Habit, Trust	

Chelminski (2013)	UK	Mobile Payment	Multiple Regression	IDT	110	Trust, Relative advantage, Perceived compatibility, Observability, Perceived complexity	Relative advantage, compatibility, Observability	Motivation factors are not studied
Dlodlo(2014)	South Africa	Mobile Payment	CB-SEM	UTAUT +TTF	269	Service quality, Trust, Satisfaction	Trust, Satisfaction	Cross-sectional design
Oliveira (2014b)	Portugal	Mobile Banking	PLS-SEM	UTAUT +TTF+I TM	194	Performance Expectancy, Effort Expectancy, Social influence, facilitating conditions, Task Characteristics, Technology Characteristics, Task technology fit	Performance Expectancy, Technology Characteristics, Task technology fit	Small sample size (194) Differences exist in the rural and urban locality and need to be explored

Slade et al. (2015)	UK	Mobile Payment	CB-SEM	UTAUT	268	Performance Expectancy, Effort Expectancy, Social influence, Trust, Risk, Innovativeness	Performance Expectancy, Social influence, Innovativeness, Risk	Cross-sectional dataset
Oliveira et al. (2016)	Spain	Mobile Payment	PLS-SEM	UTAUT 2+IDT	301	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Hedonic Motivation, Price Value, Perceived Security, Compatibility	Compatibility, Perceived Security, Effort Expectancy, Social influence	Trust and risk were not included, 88% of the sample is less than 45 years of age
Mahfuz et al. (2016)	Bangladesh	Mobile Banking	PLS-SEM	UTAUT 2	415	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Hedonic Motivation, Price Value, Habit	Effort Expectancy, Social influence, Facilitating conditions,	Demographic moderators were not used in the study

Afishan et al. (2016)	Pakistan	Mobile Banking	CB-SEM	UTAUT +TTF+I TM	198	Performance Expectancy, Effort Expectancy, Social influence, facilitating conditions, Task Characteristics, Technology Characteristics, Task Technology fit, Trust	Trust, facilitating conditions, Task Characteristics, Technology Characteristics, Task technology fit	Small sample size (198) Only urban consumers are studied
Bhatiasevi (2016)	Thailand	Mobile Banking	CB-SEM	UTAUT	272	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Perceived Cost, Perceived Credibility	Perceived Cost, Perceived Credibility	cross-sectional survey design
Williams et al. (2017)	Middle East and Africa	Mobile payments	PLS-SEM	TAM	237	Perceived compatibility, Perceived ease of use, Perceived usefulness, Trust	Perceived compatibility, Perceived ease of use, Perceived usefulness, Trust	Social influence and other external factors were not studied

Bhuvana (2017)	India	Mobile Banking	CB-SEM	TAM	300	Perceived ease of use, Perceived usefulness, Trust, Risk	Perceived ease of use, Perceived usefulness, Trust, Risk	
Alalwan (2017a)	Jordan	Mobile Banking	CB-SEM	UTAUT 2	343	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Hedonic Motivation, Price Value	Performance Expectancy, Effort Expectancy, Hedonic Motivation, Price Value	The moderating effect of gender and age were not studied, Cross-section Sample,
Khan et al.(2017)	Pakistan	Online Banking	CB-SEM	UTAUT 2	328	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Hedonic Motivation, Price Value, Habit, Perceived security	Performance Expectancy, Effort Expectancy, Habit, Perceived security, Price Value	Social factors were not studied
Shankar (2018)	India	Mobile Banking	CB-SEM	TAM	381	Perceived ease of use, Perceived usefulness, Trust, Innovativeness, Perceived self-efficacy, Perceived Norm	Perceived ease of use, Perceived usefulness, Trust	Cross-section sample

Alalwan et al.(2018)	Jordan	Internet Banking	CB-SEM	UTAUT 2	348	Performance Expectancy, Effort Expectancy, Social influence, facilitating conditions, Hedonic Motivation, Price Value, Habit, Risk, Benefit, Perceived behavioural control	Performance Expectancy, Effort Expectancy, Hedonic Motivation, Price Value	The moderating effect of gender and age were not studied, Cross-section Sample
Islam (2019)	Bangladesh	Mobile Banking	PLS-SEM	UTAUT	186	Performance Expectancy, Effort Expectancy, Social influence, Facilitating conditions, Credibility	Effort Expectancy, Social influence, Facilitating conditions, Credibility	A representative sample is not used, The moderating effect of gender and age were not studied, Cross-section Sample
Giovanis et al.(2019)	Greece	Mobile Banking	PLS-SEM	UTAUT	513	Performance Expectancy, Effort Expectancy, Social influence, Trust, Risk, Innovativeness	Performance Expectancy, Social influence, Trust, Risk	Cultural factors were not studied
Zhang (2019)	USA	Mobile Payments	PLS-SEM	TAM	394	Perceived ease of use, Perceived usefulness, Perceived Norm	Perceived ease of use, Perceived usefulness, Perceived Norm	Factors such as compatibility, complexity, divisibility, and communicability were not included in the model

Kaur (2020)	India	Mobile Wallets		CB-SEM	IDT	1256	Relative advantage, Perceived compatibility, Observability, Trialability, Complexity	Relative advantage, compatibility, Observability, Complexity	cross-sectional survey design
Cabanillas et al.(2020)	India	Mobile Payment		CB-SEM	TAM	260	Perceived ease of use, Perceived usefulness, Trust, Risk, Satisfaction, Innovativeness	Perceived ease of use, Perceived usefulness, Innovativeness, Trust, Risk, Satisfaction,	Hedonic and utilitarian motivation were not studied
Reith (2020)	Germany	Mobile Payments		CB-SEM		380	Trust, Risk	Trust, Risk	Culture's Effect on trust and risk are not tested
Singh et al. (2018)	India	Mobile Wallets		CB-SEM	TAM	462	Perceived ease of use, Perceived usefulness, Innovativeness	Perceived ease of use, Innovativeness	



Hossain (2016)	Bangladesh	Mobile Payments	PLS-SEM	TAM	75	Perceived ease of use, Perceived usefulness	Perceived ease of use, Perceived usefulness	A small sample size was used (69)
Jia (2015)	China	Mobile Payments	PLS-SEM	TAM	106	Perceived usefulness, Trust	Perceived usefulness, Trust	The average age of the sample is small (<30) and small size (106)
Jia (2015)	China	Mobile Payments	PLS-SEM	TAM	106	Perceived usefulness, Trust	Perceived usefulness, Trust	The average age of the sample is small (<30) and small size (106)
Albshrawi et al.(2015)	USA	Mobile Banking	Multiple Regression	TAM	486	Perceived ease of use, Perceived usefulness	Perceived ease of use, Perceived usefulness	Can be generalised to customers of mid-size US banks

Jamshidi et al.(2018)	Iran	Mobile Banking	PLS-SEM		1300	Social influence, Hedonic Motivation, Trust	Trust	The rural population is not included in the sample
Susanto et al. (2016)	South Korea	Mobile Banking	PLS-SEM	ECM	301	Perceived usefulness, Trust, Satisfaction, Perceived self-efficacy	Perceived usefulness, Trust, Satisfaction, Perceived self-efficacy	External factors such as social influence were not included
Al Khasawneh (2015)	Jordan	Mobile Banking	PLS-SEM		268	Trust, Credibility, Complexity, Relative advantage, Norm, compatibility, Social Influence, Perceived Behavioural Control	Relative advantage, compatibility, Perceived Behavioural Control	Cross-Sectional sample

### 2.3.4. Statistical Analysis

This section covers the calculation of the overall effect size between the various constructs and the dependent variable (BI). The popular modelling techniques are discussed in section 2.3.4.1 followed by the calculation on effect sizes.

#### 2.3.4.1. Descriptive Statistics

30 independent constructs were identified in the empirical literature with a majority of the studies using PLS-SEM (49%), followed by CB-SEM (45%) and multiple regression (6%) to analyze the survey data. The models/frameworks which are dictated by the underlying theoretical base are critical towards increasing our understanding of mobile payment adoption. The most popular model used is the technology adoption model (43%). A summary of the models/frameworks used to understand mobile payment adoption is presented in figure 2.10.

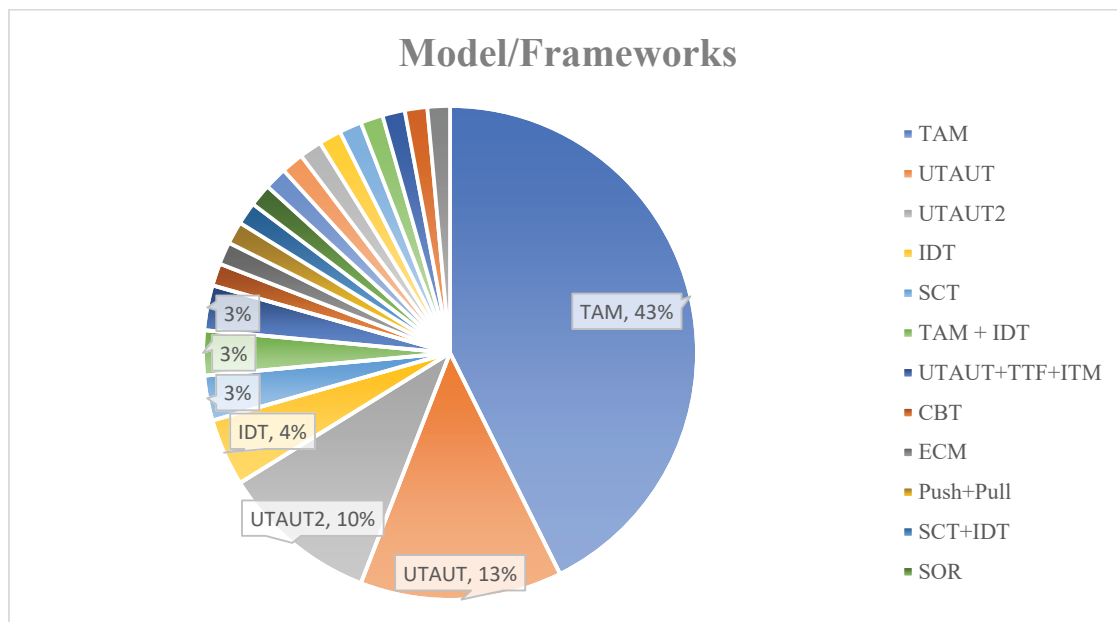


Figure 2.10 Models/ Frameworks used in the empirical studies

Notes: SCT, social cognitive theory ;IDT, innovation diffusion theory; ITM, initial trust model; ECM, expectation confirmation model; SOR, stimulus organism response

### **2.3.4.2. Effect Size Calculation**

The empirical literature on mobile payment is mostly carried out as a survey and most of the studies report the correlation coefficient ( $r$ ) of the independent variables with respect to their dependent variable (intention). Hence, the correlation coefficient is selected as the effect to be considered in this study. There are two ways to calculate the correct effect size i.e., individually correct effect size and correction using artifact distribution. In this research the preferred method to calculate the overall effect using individually corrected effect sizes over artifact distribution as the latter suffers from low statistical power (Hedges & Pigott, 2004).

In this research effect sizes are corrected in two steps where each step corrects for one specific artifact.

STEP1: Sampling error is random or unsystematic in nature. The true correlation values could be above or below than reported in the article. It is however possible to estimate and correct the correlation values in a meta-analysis as a greater number of studies are used to increase the overall sample size on which a better estimate can be made with decreased influence from sampling error. Sampling error introduces a constant term called sampling error variance to variance of correlation values across studies and this should be deducted from the observed variance.

STEP 2: True correlation values can also be affected by the measurement error associated with the variable that is used to measure the phenomenon. This measurement error is captured by the reliability coefficients associated with the variable. The most popular reliability coefficient is Cronbach's alpha, which is usually reported in the articles. The correlation values are

corrected by dividing the observed correlation by the product of square root the reported reliabilities for the independent and dependent variable.

The overall effect sizes were calculated by using the psychmeta package in r programming language (Dahlke & Wiernik, 2019; R Core Team, 2013). The summary of the effect sizes is mentioned in table 2.3 along with their confidence intervals.

Table 2.3 Summary of effect sizes

<b>Independent Variables</b>	<b>Dependent Variable</b>	<b>No. of studies</b>	<b>Total Sample Size</b>	<b>Corrected_r</b>	<b>Confidence Interval (Lower Limit) @.95</b>	<b>Confidence Interval (Upper Limit) @.95</b>
Perceived Usefulness	Behavioural Intention/ Intention to continue	36	11894	0.575	0.58	0.76
Perceived Ease of use		32	11173	0.472	0.45	0.63
Risk		24	8454	-0.070	-0.27	0.11
Social Influence		23	9254	0.417	0.34	0.59
Trust		21	7277	0.593	0.55	0.77
Performance Expectancy		21	7655	0.605	0.59	0.79
Effort Expectancy		21	7707	0.533	0.53	0.67
Facilitating Condition		21	7216	0.469	0.46	0.63
Comparability		14	5016	0.561	0.48	0.84
Hedonic Motivation		12	5906	0.475	0.35	0.72
Perceived Security		11	3881	0.534	0.50	0.71
Efficacy		10	3962	0.493	0.31	0.77
Innovation		10	4314	0.439	0.36	0.61
Norm		9	3769	0.541	0.41	0.78

Satisfaction		9	3289	0.606	0.57	0.90
Price Value		9	2983	0.394	0.22	0.67
Complexity		6	2695	0.439	-0.02	1.05
Credibility		6	1865	0.557	0.44	0.91
Task Technology Fit		6	1656	0.554	0.57	0.71
Relative Advantage		6	2649	0.513	0.21	1.05
Habit		6	2511	0.554	0.32	0.91
Control		5	1716	0.481	0.38	0.80
Task Characteristics		5	1222	0.286	-0.10	0.76
Technology Characteristics		5	1222	0.438	0.34	0.63
Cost		4	1523	0.441	-0.17	1.19
Trialability		3	1833	0.296	-0.48	1.20
Image		2	602	0.457	-1.69	2.73
Observability		2	1366	0.505	0.52	1.35
Benefit		1	418	0.300	0.24	0.44

Note: Corrected<sub>r</sub>, represents the correlation coefficient after adjusting for sampling and measurement error

### 2.3.5. Gap Analysis

From the study characteristics section [refer to table 2.2] we found the following gaps in the literature:

- Samples consist of students and the results cannot be generalized. This is not a true representation of countries that have an older population.
- Inadequate sample size selected for the study affecting the power to detect the true effect
- A comprehensive list of variables is not undertaken, mostly external factors are ignored

- The variance explained by the models is not satisfactory.
- A single data collection method was used and can often lead to biased samples.
- Multiple samples were not taken from different countries and this process makes the results contextual
- Most of the studies have used the technology adoption model (TAM) as the basis of designing structural models.

The Gaps addressed in this research are discussed as follows:

- TAM is still the widely used model to study intention for mobile payment, which is shown in the survey of the literature. The inherent problem associated with TAM is it does not offer a comprehensive picture of adoption as perceived usefulness and ease of use cannot dictate the adoption behaviour. Factors associated such as norms in the society, pleasure derived out of using technology and price can also influence adoption behaviour(Limayem & Hirt, 2003; Venkatesh et al., 2003, 2012b). The underlying assumption of these models is that the user is a rational human being and takes the decision-based evaluation of benefits associated with using technology but factors like a habit that represents the irrational side of human behaviour are seldom used.
- TTF is rarely studied to understand the intention to study mobile payment. The primary use of TTF was to study the utilisation aspect of adoption but it does affect adoption behaviour (refer to section 2.2.6) and should be included in the model to improve our understanding of technology adoption.

- Due to the transmission and storing of sensitive financial and personal information security should be studied when measuring intention to use mobile payment adoption (Wang et al., 2020). But very few studies include any construct to understand the security aspect and even if some studies do include security, they use unidimensional constructs (e.g., risk, trust).
- Government policy has never been studied in the context of ICT technology even if the technology under study is a general-purpose technology and is mostly guided by the volitional aspect of an individual. The influence of government policy on the adoption of information and communication have garnered limited attention from researchers (Khan et al., 2020). Technology does provide better information and knowledge sharing, reduce inefficiencies, promote technical and economic growth. Governments of various countries have tried to popularise the use of technology and even mandated their use. Hence, institutional isomorphic theory can be used as a theoretical foundation to study the influence of government policy on the intention to adopt mobile payments in India.
- The statistical power of the study has never been reported in these articles which prohibits us to generalise the findings.
- PLS-SEM and CB-SEM are the two methodologies used to analyse the data, but these methods can only identify the sufficient factor. To understand the adoption of the population at large new methodologies should be used to identify the necessary factors and can act as a complement to the SEM-based methods.



The exhaustive literature review helped to identify the variables that can affect users' intention to adopt mobile payments. The Models with a comprehensive set of variables offer a better explanation of the variance in intention to adopt. As the study is focused to explain the intention of end-users, UTAUT2 offers significant benefits. In the next chapter, a model is proposed along with the necessary hypothesis.