"Mobile-App Adoption in Tourism and Hospitality: Understanding Influence of Customer Typology based on Uses, Gratification and Risk Perception"

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by

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DECLARATION

I, **Mayanka Singh Chhonker (2013RBM9544),** declare that this thesis titled, **"Mobile-App Adoption in Tourism and Hospitality: Understanding Influence of Customer Typology based on Uses, Gratification and Risk Perception"** and the work presented in it, are my own. I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this university.

2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this university or any other institution, this has been clearly stated.

3. Where I have consulted the published work of others, this is always clearly attributed.

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                                                                   Student ID: 2013RBM9544

CERTIFICATE

This is to certify that thesis entitled "**Mobile-App Adoption in Tourism and Hospitality: Understanding Influence of Customer Typology based on Uses, Gratification and Risk Perception**" is being submitted by **Ms. Mayanka Singh Chhonker (ID No: 2013RBM9544)** to the Malaviya National Institute of Technology Jaipur for the award of the degree of **Doctorate of Philosophy**. This is a bonafide record of original research work carried out by her. She has worked under our guidance and supervision and has fulfilled the requirement for the submission of this thesis, which has reached to the requisite standard.

The results contained in this thesis have not submitted to any other University or Institute for the award of a degree or diploma.

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ABSTRACT

Due to the rapid development in the usage of smartphones caused a phenomenal shift in travelling and hospitality sector. The adoption of technologies in the market changed the way travellers and guest consumes tourism product and services. The use of smartphones, tablets and available information on traditional websites are constantly persuading the travellers to experience various unexplored destinations. To identify the factors that predict the acceptance towards these evolving technologies in the market have been investigated with the help of various models. Predominantly, technology acceptance model (TAM) have been utilised the most. The current study although aims to explore the factors influencing the usage of travelling apps based on unified theory of acceptance and use of technology (UTAUT). UTAUT was conceptualised by Venkatesh *et al.* (2003) and it has been widely employed in various studies. Venkatesh *et al.* (2003) conceptualised UTAUT by integrating eight behavioral intention models previously implemented in technology acceptance domain. Despite the extensive number of studies in various domain, studies in the context of travelling and hospitality sector are still inadequate. Literature also indicated that many hedonic factors are still unexplored in the model that influences the usage behavior. Thus, many extended frameworks have been proposed and tested to increase the explanatory power of UTAUT. For example, perceived trust, perceived risk, innovativeness, entertainment, perceived value, perceived benefits, perceived security and so on. The usage of mobile applications are soaring for various activities and at the same time various barriers that have been affecting the continued usage of such applications. These factors may not directly influencing due to collective usage in the present era, but a number of user segments are indeed affected thus inhibiting their continued usage. The current study explores the influence of the barriers in regard of perceived risk. Similarly, the motivations behind using travelling apps are indeed essential to explore. Hence, the study aims to identify the homogenous profile of such travellers based on their perceived risk and uses and gratifications and examine their influence on travelling app usage behavior.

In order to overcome the discussed limitations, the present study proposed a conceptual framework demonstrating the direct influence of factors predicting the usage of travelling apps. In addition, the model examined the overlooked influence of the travellers typology based on risk perception and uses and gratifications along with age, gender and experience. The conceptual framework investigated the direct relationship between performance expectancy, effort expectancy, social influence, facilitating conditions, behavioral intentions and usage behaviour (PE→BI, EE→BI, SI→BI, FC→BU, BI→BU). Likewise, the relationships were investigated between age→PE, EE, SI and FC; gender→PE, EE and FC; experience→EE, SI and FC. Lastly, the key contribution of this study in regard to examine the influence of typology of travellers based on risk perception and uses and gratifications viz. typology→PE, EE, SI and FC.

In order to examine the correlational paths the current study employed quantitative methodology. Cross-sectional survey method was used to collect the data. The data for the study was collected from travelling app users in across India. The final model was examined with 707 responses, with a response rate 84.6% (i.e. 707 out of 835). The proposed hypothesis were investigated using structural equation modelling (SEM) based on partial least square (PLS) using SmartPLS software. The influence of indirect relationships were investigated in two ways: one using multigroup analysis and other using moderating effect using smartPLS. The age, gender and experience were classified into two categories, further were examined using multigroup analysis (MGA). Lastly, the typology was classified into four categories namely, worried traveller, anxious traveller, savvy traveller and deal seekers. Further, these typologies were examined using moderating effect in the study.

Findings of the study implicates that the extended framework qualifies to be fit with the data and the direct relationships were significant except social influence on behavioral intention (SI→BI). The explained variance by independent variables on dependent variables were consistent with UTAUT (R^2 = 29% and BI→BU 20% using SmartPLS). Behavioral intention to usage behavior (BI→BU) and effort expectancy to behavioral intention (EE→BI) followed by performance expectancy to behavioral intention (PE→BI) and facilitating condition (FC→BU). The results of the moderators indicates that PE→BI has no influence of gender, age and typology. Similarly, EE→BI has no

significant indirect influence typology, gender and age but influenced by experience. The influence of gender on SI→BI was supported and age, experience and typology did not supported. Lastly, FC→BU was not supported by the indirect influence of age and experience but was supported by traveller typology. The influence of moderators on direct relationships indicates that the traveller's typology in terms of four profiles identified in the current study implicates the significance of support system to use travelling applications such as robust customer care executive system, uninterrupted mobile data or wireless services to use travelling apps, more offers and promotional coupons and so on. Similarly, among gender females are influenced by their social circle to use travelling apps than males. Further, effort expectancy on behavioral intention has indirect influence of low experienced travelling app users than high experience. The continued usage for such by low experience users demand more efforts. Limitations, future scope and managerial practices are formulated based on these discussed findings.

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CHAPTER 1
INTRODUCTION

1.1 INTRODUCTION

In this chapter, the primary aim is to identify and discuss the factors influencing usage of mobile app. The chapter addressed various information systems' theories grounded to explain the behavioural determinants for adopting proper technology. In addition to this, it also presents the significance of risk perception and uses-and-gratifications in the context on mobile application acceptance by the travellers. The structure of this chapter is as follows:

1. Section 1.2 - In this, a brief explanation of the background on the mobile commerce and use of mobile applications in the travel and hospitality sector as well highlighted for proper knowledge.

2. Section 1.3 – In this section, the research problem and its rationality for the current study has been stated properly that prompted for the research.

3. Section 1.4 - This section focused on the research objectives exclusively.

4. Section 1.5 - In this section, the research design adopted for the current study is discussed in detail

5. Section 1.6 - The section dwells upon the contribution of the current study in the travel and hospitality domain.

6. Section 1.7 - The section presented structure for the rest of the thesis.

1.2 BACKGROUND OF THE STUDY

Technology has become an integral part of our lives. It helps human beings in every sphere of life, be it personal or commercial (da Costa Liberato *et al.,* 2018). The current era of technology advancement is more palpable than what it used to be in the earlier generations (Kellerman, 2015). The emergence of hand-held devices is getting popular, accessible, convenient and economical unlike the desktops and personal computers (Dieck and Jung, 2015). It has enlarged the scope of opportunities for the fields of trade, commerce and consumers as well (Boes *et al.,* 2015). These handheld devices can be categorized as mobile phones, various kinds of computers (notebook, play station portable, ultra-mobile PC), communication devices (mobile devices) and media recorders too (Kellerman, 2015). Mobile commerce is still in its evolving stage and

gaining attention phenomenally until date. Many academicians and scholars had explored to identify the significant growth and factors affecting behavioural intentions and usage. It was found that developing nations of Asia like India, China, Taiwan, Japan and Singapore are the potential markets in the world for mobile commerce acceptance, in contrast to the developed ones like US and Europe (Zhang *et al.,* 2012; Rather *et al.,* 2019). In the current study, the primary focus was given to the Mobile-App used for travel purposes.

In the past five years, there has been a phenomenal shift *(limited travelling services to holistic services)* of usage and experience by these travel app users with the help of Mobile-App's user base in India. India is the second largest market for mobile connections with unique subscribers in the world and is estimated to reach more than 500 million mobile internet users (Iyengar, 2017). In addition, in order to use various digital tools for travelling purposes, it has been appeared as *"the most digitally advanced traveller nation"*. It was also revealed that in order to utilise the digital services such as mobile boarding passes, e-tickets etc. smartphones have become the most adopted device for Indian travellers (IBEF, 2017). Thus, this scenario is an indicator for the rapid emergence of mobile application usage.

1.2.1 EVOLUTION IN TRAVELLING AND HOSPITALITY

The branches of Travel and hospitality is such sector that is witnessing the rapid development for Information Technologies (IT) and various digital transformations (Garau, 2014). Internet services have entirely changed the way travel and hospitality sectors used to operate a decade ago (Kramer *et al.,* 2007; Gretzel *et al.,* 2015). It has entirely changed the way markets, the organizations and customer interact with each other (Buhalis and Law, 2008). At present, the travellers are travel agents of their own, right beginning from selecting the destination to design the itinerary each element is now being taken care off by them at their costing and time convenience, travel duration, preference for accommodation and types of accommodation (Sigala, 2010; Hjalager and Jensen, 2012). Use of smartphones has become the primary source of information to search anything related to travel or for searching for an appropriate accommodation (Grønflaten, 2009a; Groth and Haslwanter, 2015).

Figure 1.1 demonstrates the evolution of e-commerce websites to m-commerce applications in travel and hospitality sectors. The website designs have evolved from static web designs to responsive and dynamic web designs. Due to the shift in user

behaviour and rise in number of mobile devices in the market, the need was observed to make these websites responsive to any device or size of the screen (Gardner, 2011). The approach of responsive web design is a method to alter the static websites (*that does not alter for viewer*) and dynamic websites (*alters everyday as per viewer*) based on device perspective (Groth and Haslwanter, 2015). This method transforms the websites into receptive and adaptive elements that are flexible (*images, grid and content as per viewer*) to be rearranged automatically as per the screen/device (Bohyun, 2013).
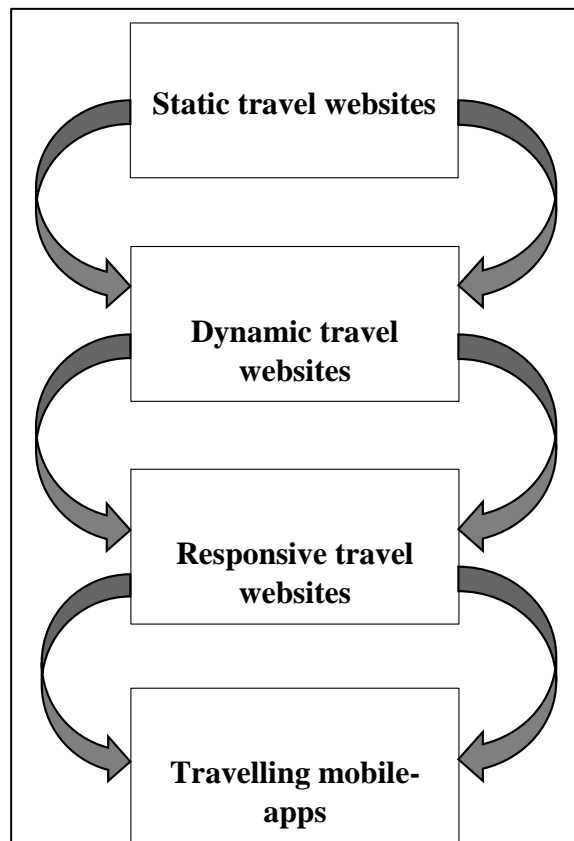
Figure 1.1 Evolution of online travel platform

In the earlier phase of m-commerce application in the market, the online travel companies and hotel chains were responding the travellers through the dynamic websites. Responsive websites and mobile applications began serving travellers with improved searched results, easy to understand interfaces and ubiquitous experiences while travelling (Groth and Haslwanter, 2015a). Despite the successful implementation of responsive web designs (RWD) it also encountered with various limitations as well. Exceptionally from the perspective of tourism and hospitality, RWD method could not assure the same content as effective and aesthetic for a mobile user (Wessels *et al.,* 2011). Therefore, the challenge to provide the content in a restricted screen and limited

space led the mobile application emerged as a platform meant for the mobile devices (Bohyun, 2013).

Various travelling applications offered by all leading travel companies and hotel chains are available on mobile application stores such as Apple App Store, Google Play Store etc. (Ho *et al.,* 2012). With the increasing phenomenal demand from the side of travellers and supply from the travel giants and hotel chains, the battle for Operating Systems (OS) platforms among the tech-giants such as Apple, Google and Microsoft has gained a lot of focus in the market (Ricci, 2010). Due to the growing adoption of Mobile-App among smartphone users. Scholars and researchers are exploring the pre-requisites of traveller acceptance for mobile services and usage of such applications (Rasinger *et al.,* 2009). As discussed in a study conducted by Bouwman *et al.* (2012), the studies on mobile travel services so far have focused on building new services. However, it is also significant to explore and understand the question "why such a user acceptance?" and "how they accept the travelling applications?".

A vast number of research studies have been conducted in predicting the user behaviour of mobile commerce applications (Nysveen *et al.,* 2003; Riebeck *et al.,* 2008; Kim *et al.,* 2008; No and Kim, 2011; Young Im and Hancer, 2014). As per KPMG report, 54% consumers spent on e-commerce via mobile shopping app. There has been a dramatic price cut in mobile data and a significant increased consumption. According to the "*Digital transactions shoot up (2018)*", the growth rate of the digital payments industry, which was earlier in the range of 20 to 50 percent, has accelerated post demonetization to 40 to 70 percent. According to a report *"The mobile travel market in 2016",* people are spending more than two hours in a day on Mobile-App. It can be observed that Airbnb has recently started their promotions to Indian markets with the help of celebrity endorsements through internet marketing. Due to the increased amount of time spent on smartphones, Airbnb chose digital marketing strategy to attract Indian customers. Khare and Khare (2010) discussed that purchase of travel services over internet platforms are complex in nature due its vertical arrangements that were influenced by user's demographics and intentions.

As Indian travellers are highly influenced due to their cultural beliefs, the acceptance for mobile applications is hugely dependent on such factors. Developing nations such as India still lacks the robust infrastructure in terms of networks, security of payment gateways and personal details and so on. Consequently, it is essential to understand the

traveller's inhibitors as well their drivers in terms their perceived risks and uses-and-gratifications associated with travelling mobile applications.

1.3 RESEARCH PROBLEM AND RATIONALE OF THE STUDY

Economic liberalization has led the aspirational class to travel international, inflow of foreign investments and establishments brought the international arrival of delegates, events, and competition among airline companies has led reduction in the airfares, opening up skies for many companies (Kwon *et al.,* 2013; Sinha *et al.,* 2018). Therefore, factors in the context of globalization and liberalization have changed the way today's era market is functioning (Radas and Božić, 2009). Consequently, holidaymakers and travellers are experiencing a transforming digital revolution across the world (Avgerou, 2008). In a developing country like India planning holidays and travel is no more subject to contact or visit to a local travel agent. Smartphones are omnipresent with nearly 500 million of Indian population having access to mobile internet (IAMAI, 2018). India is ranked third largest market in online segment followed by China and USA. The penetration of internet is higher in the urban India than in rural that constitute around 64%. The proportion of internet users in urban India is higher despite the acute population divide, where the rural population is larger but lesser in terms of internet users. Out of 455 million urban users, nearly 291 million mobile internet user base belongs to urban and out of 918 million population nearly 187 million mobile internet user base belongs to rural segment. Therefore, it is evident from the asserted facts that penetration of mobile internet based services is higher in urban segment of the country than the rural one. The report also revealed that the mobile internet users are predominantly youngsters ranging from 25 to 44 years old. Apparently, the male users in both urban and rural base are higher than female users. Consequently, the increased reach of the mobile internet services in the market has transformed the travel and hospitality sectors as well (Khare and Khare, 2010).

Studies in the domain of information systems are rapidly changing due to the tremendous advancement in the services being provided through smartphones or mobile devices. Many researchers have been implementing various traditional theories of information systems to identify the motives to use mobile devices or services. Some of these studies either have modified these traditional theories or extended their version by introducing direct and indirect relationships (Nysveen *et al.,* 2005). For example, Mobile Travel Guide Systems (Tsai, 2010); App-Based Tour Guide (Lai, 2013); travel

information on smartphone (No and Kim, 2014); Travel Mobile Applications (Im and Hancer, 2014); NFC Mobile Payments (Morosan and DeFranco, 2016).

Due to the increased number of mobile internet users and increased number of smartphone users in India, it has influenced and changed the way travel and hospitality sectors have been functioning so far. Smartphones enables value added services (VAS) as a tool to a user such as web browsing, radio, mobile applications, caller tunes and so on (Kim *et al.,* 2008; Eriksson and Strandvik, 2009; Groth and Haslwanter, 2015). On that account, the use of mobile applications grew at explosive growth in travel and hospitality sectors as well (Kramer *et al.,* 2007; Kim *et al.,* 2008). The use of such applications has opened up platforms to build relationship among travellers, travel companies, hotel chains and so on (Gretzel *et al.,* 2006).

By the virtue of intangibility in high degree in travel and hospitality sectors, it is challenging to cater needs and preferences of travellers without a clear understanding of technological models (Buonincontri and Micera, 2016; da Costa Liberato *et al.,* 2018). Various perceived risks and factors affecting the travellers using the Mobile-App need thorough comprehension of attitudinal and behavioural analysis (Wethner *et al.,* 2015). The quality delivered on online platforms by service provider are highly associated with perceived risks, credibility, trust and reliability (Claycomb and Martin, 2001; Thakur and Srivastava, 2014; Chopdar and Sivakumar, 2019). With the growing number of empirical studies exploring the impact of various perceived risk, still there is insufficient understanding on mobile applications usage for travelling purposes.

While there is an enough research on the attitudinal behaviour of travellers that are using digital platforms in the US, European Union and South East Asian countries (Chhonker *et al.,* 2017). However, not enough research were conducted in terms of behaviour usage and various unexplored moderating variables influencing the Mobile-App user. In addition, limited studies were able to explore the travellers who are profiled together based on their particular perceived risks and particular gratifications.

It is essential to identify such profile of travellers based on their risks and gratifications as they can help the travel agents, hoteliers and Mobile-App developers to improvise on traveller retention (Hyun *et al.,* 2009). However, in the current study the difference between tourist and a traveller was irrelevant since usage of travelling app was the primary focus of the study. For example, various mobile applications are subjected to its use by an individual who utilises them in the due course of his/her travelling, irrespective of the reasons (destination/official/personal). In a qualitative study

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conducted by Mccabe (2005) it was clearly differentiated based on various in-depth interviews where the respondents identified themselves either tourist or traveller for the specific reasons. Where the traveller was identified as a person who is open to explore, take risk, embrace culture, food, transport where as a tourist is restricted to popular destinations only. Hence, considering one among the category had no relevance in the context of travel app usage as they all are being used in combination by a tourist *(searching accommodation/transport/touristic destinations)* or individually by a traveller *(executive manager availing the facilities for his official trip Ola/Uber/Google maps/)*.

Therefore, the scope to conduct a study explored these profiles and further identified their indirect influence on usage behaviour would provide in-depth insights to practitioners as well as academicians. Although, studies based on segmentation in the domain of consumer behaviour are abundant, however, studies on travellers are still less in numbers (Chen and Hsu, 1999). Apparently, stand-alone studies treating risk perceptions (Featherman and Pavlou, 2003), uses-and-gratifications have been reported in the literature. In addition, studies conducted on uses-and-gratifications have mostly been explored in the areas of media and consumer behaviour, literature found in the context of Indian travel and hospitality is inadequate. However, the current study is an attempt to explore the influence of the Mobile-App user profile on usage behaviour.

The literature indicates that earlier studies and empirical research conducted worldwide have exhibited only behavioural intentions and work on typologies of travellers have not been explored sufficiently (Chan and Uysal, 2003). Nysveen *et al.* (2005) pointed out that many studies have explored the motivation behind using mobile services, however though there are still some unidentified dimensions related to behaviour intentions. This can be further discussed in terms of the influence of moderating variables on intention and usage. In addition, San-Martín *et al.* (2013) cited out that, identifying the influence of moderators assist in getting more nuance understanding of the motivation for using the mobile services has assisted. Exploring the moderating effects is essential due to the developing sophistication in information technologies. A less number of studies have explored the moderating influence of mobile users based on their perceived drivers and inhibitors. Although, these studies have explored the profiles based on experience or age; however, these were not based on drivers or inhibitors (Taylor and Todd, 1995; Bigné *et al.,* 2009). Further, San Martín and

Camarero (2008) discovered that users perceived drivers and inhibitors could influence the technology adoption behaviour of the user.

As asserted, due to the limited literature on examining, the influence of profiles in this area i.e. travel and hospitality based risk perceptions (Featherman and Pavlou, 2003) and uses-and-gratifications (Stafford and Stafford, 2004). These were considered as identified research gap (McKnight and Chervany, 2001; Khare and Khare, 2010; Kim *et al.,* 2011; Choi *et al.,* 2016). This can contribute in understanding the factors affecting preferences of the users for selecting Mobile-App in travel and hospitality purposes in order to provide the tailored services.

1.4 OBJECTIVES OF THE STUDY

Following were the proposed research objectives in context of Mobile-App adoption in Travel and Hospitality are:

1. To examine factors influencing Mobile-App usage behaviour.
2. To study influence of customer typology based on their uses-and-gratifications.
    a. To classify and profile travellers based on their risk perceptions (and uses-and-gratifications)
3. To assess the influence of demographics (age, gender, experience) on mobile application adoption behaviour.

1.5 RESEARCH DESIGN

Creswell *et al.* (2017) stated that research design is an architectural set up of how the research and the proposed objectives are going to be delivered with defined target to collect data and analyse them for further interpretations. The structure of research design facilitates and ensures in addressing the research problem, further to enumerate all the elements of research design chapter 4 discussed them in detail. The research applied for current study is positivistic paradigm from the philosophical perspective. Data collection was accomplished with the help of survey method. According to Gilber (2001), while choosing a research approach the involvement of the researcher's role is also studied as part of the research. Overall, the primary purpose of this study is to test the proposed hypothetical relationships and examine the moderating influence of the introduced variable in the conceptual framework along with other existing moderators. The classification of the investigation is correlational. The research setting is uncontrolled or non-contrived in nature as survey or field studies involve limited

arbitration of the researcher. In order to carry out the data analysis, individual who uses the Mobile-App was carefully targeted. Lastly, the approach for timeline selected for the current study is cross-sectional also known as one-time study with the help of the primary data collected from the respondents who represented the sample.

The survey instrument was developed with the help of the existing theory in the literature of information systems i.e. Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh *et al.* (2003). In order to formulate the typology as moderating variable, two theories were employed, risk perception and uses-and-gratifications (Featherman and Pavlou, 2003; Stafford and Gillenson, 2004; Luo and Remus, 2014; San-Martin *et al.,* 2014). Instrument was finalized for the main study for the post content validity and reliability in the pilot study. Post instrument finalization, using a non-probabilistic sampling approach the data was collected through self-administration for the target of 900 respondents from India.

With the help of descriptive statistical technique in SPSS version 21.0, completed questionnaires were scrutinized for the data analysis. The components of the data analysis employed in the current study includes identifying missing values from the dataset, assumptions of normality, multi-collinearity, outliers followed by Exploratory Factor analysis and cluster analysis. In the second stage, CFA and SEM was used to test and validate the model fit of the proposed conceptual framework and proposed hypotheses. The fundamental analysis technique within structural equation modelling (SEM) i.e. partial least square (PLS) method was used in the current study using SmartPLS version 3.2.8 to confirm the robustness and model fit.

1.6 CONTRIBUTION OF THE STUDY

Contribution of this study will be added into the theoretical knowledge of technology adoption followed by methodological and practical understanding towards the traveller's Mobile-App usage behaviour. The key contribution of this study is the determination of typology of Mobile-App users based on risk perceptions and uses-and-gratifications. Further the study delineated the new variable i.e. customer typology (travellers) that moderates the usage behaviour of Mobile-App users. Therefore, the empirical findings of this study contribute to the theoretical knowledge about the Mobile-App usage behaviour.

1.7 OUTLINE OF THE THESIS

The structure of the thesis consists of seven chapters. Chapter 1 describes the brief Introduction and background of the study along with the research objectives, problem, contribution of the study and outline of the thesis. Chapter 2 describes the literature review regarding the information system theories, and comprehensive overview of the theories and constructs employed to identify the typology i.e. risk perceptions and uses-and-gratifications. Chapter 3 discusses the conceptual framework and proposed research hypotheses of the study and moderators that were anticipated to influence the usage behaviour of the travellers. Chapter 4 presents the detailed explanation of the research methods implemented in the current study along with their justifications. Moreover, the research process, research design, instrument development, preliminary study, results of preliminary study, sample selection, sample size, method of data collection, data analysis and data interpretation have been comprehensively discussed in this chapter. Chapter 5 presents the results of the main study in terms of Exploratory Factor Analysis, multivariate analysis, and cluster analysis to identify the customer typology and structure equation modelling (SEM) to validate the model fit using SmartPLS software version 3.2.8. Chapter 6 discusses the key findings of the study and its implications including theoretical and implications for practitioners and the conclusion followed by suggestions for the scope in future research and limitations of the study.

CHAPTER 2
LITERATURE REVIEW

2.1. INTRODUCTION

The main purpose of this chapter is to scrutinize and discuss the relevant literature, which helped in to build the conceptual framework. Literature review helps reader to have an in depth knowledge and a better understanding about the specific area or subject. It highlights the further growth channels in a field of study. The publication of these reviews are laborious in nature and many of them actually require more of hands on experience and manual approach. The current study explicitly focuses on the growth of mobile commerce adoption literature. Although, various mobile commerce studies found in the review process were based on various theories except technology adoption frameworks in the literature. The chapter summarizes three essential theories named Unified Theory of Acceptance and Use of Technology (UTAUT), Uses-and-gratifications, Risk Perception/Perceived Risks in the stated context. With the radical shift in the usage of mobile devices to smartphones has evolved the market from both perspectives i.e. from consumer and from producers as well.

It also presents the evolution of the prominent technology adoption theories/models in information systems research. With the growing emergence of technological innovations, these theories have been playing a vital role to predict and manifest the acceptance by human behaviour. The main objective of these theories/models is to identify the intention and pattern of technology acceptance usage. These theories have encountered gradual improvisation with the advancement of the technological innovations. Apparently, models of technology adoption have been predominantly derived from two elementary information systems' theories called **Diffusion of Innovation (DOI) and Social Cognitive Theory (SCT)**. These theories are followed by brief explanation from Section 2.2 onwards.

2.2. THEORIES OF TECHNOLOGY ADOPTION

It has been more than two decades that the user acceptance of technology has been studied in an exhaustive manner and irrespective of streams. Nowadays, technology plays a vital role in trade and commerce, in facilitating government and individuals. Many adoption theories have been developed to predict and explain the user intention

to accept technology. The following sections presents the theories of technology adoption comprehensively.

2.2.1. DIFFUSION OF INNOVATION THEORY (DOI)

Diffusion of Innovation theory (DOI), also known as the Innovation Theory of Diffusion (IDT) (Rogers, 1995) is one of the earliest and oldest theories that have been used to explain the acceptance behaviour of humans. This theory was later taken as an instrumental background for the modern and recent technology adoption models. Although the concept of this theory is based on "S-shaped Diffusion Curve Theory", and is introduced by a French Sociologist Gabriel Trade, it measures the rate of adoption in innovation (Rogers, 2003). Besides this, Roger has defined diffusion as "a process via an innovation is transmitted through a certain channel over a specific period in the social system". A predictable pattern has been observed in many studies forming an "S" shape over a time in diffusion dispersion. The prime components of diffusion of theory are as follows:-

1. *Innovation*- briefly explained by Roger in the form of five attributes viz. *relative advantage* as the degree to which an innovation is perceived as better than the idea it supersedes (Rogers, 2003, p. 16). It describes that an individual, until and unless will not find the innovation as an objective of benefit, the user will not find it worthy. The higher perceived relative advantage of an innovation, greater will be its adoption. *Compatibility* as degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters (Rogers, 2003, p. 16). *Complexity* is the degree to which an innovation is perceived as difficult to understand and use (Rogers, 2003, p. 16). *Trialability* as degree to which an innovation may be experimented with on a limited basis (Rogers, 2003, p. 16). In Everett M. Rogers as cited by Chen (2013), complexity was explained as a perceived difficulty of any user to adopt an innovation. This attribute is negatively correlated to innovation adoption unlike the earlier attributes. Therefore, if a technology is more complicated than its hurdle results in less rate of adoption. Lastly, *observability* as the degree to which the results of an innovation are visible to others and are positively related to the rate of adoption (Rogers, 2003, p. 16). In other words, when members in the social system observe and communicate the innovation effectively with the other members of the system, the rate of adoption becomes higher.

2. ***Adopter***- *It is* defined as individual degree of innovativeness. In other words, where an adopter is relatively adopting the innovation in the early stages of the transition.

3. ***Social system***- *It is defined* specifically as the structure of the system including its leaders and the potential adopter's perception of the societal influence to accept.

4. ***Individual adoption process***- *It is* defined as a model of stage-order where an individual gets aware, persuades, takes decision, implements it and continues to use an innovation.

5. ***Diffusion system***- *It is defined* especially as an external change agency and its paid change agents who, if well trained correctly seek out and intervene with the client system's opinion leaders, paraprofessional aides, and innovation champions.

This model was widely used and implemented in various studies by academicians and research scholars viz. Mobile banking (Al-Jabri and Sohail, 2012), IT adoption in school education system (Jwaifell and Gasaymeh, 2013), internet banking (Nor *et al.,* 2010) and mobile banking adoption (Lin, 2011). According to the theory, it defines that any individual perceived the innovation in a certain manner. It has also been explained that the characteristics of innovation perceived by individuals as relative advantage, compatibility, complexity, trialability and observability. Moreover, Moore and Benbasat (1991) reviewed the theory and stated that the instruments, which were developed and used to study the innovation, were lacking reliability and validity. They developed an instrument specifically for information system naming its perceived characteristics of innovation (PCI) by using the DOI attributes. Further two constructs (image and voluntariness) were also added later, in order to make it more parsimonious.
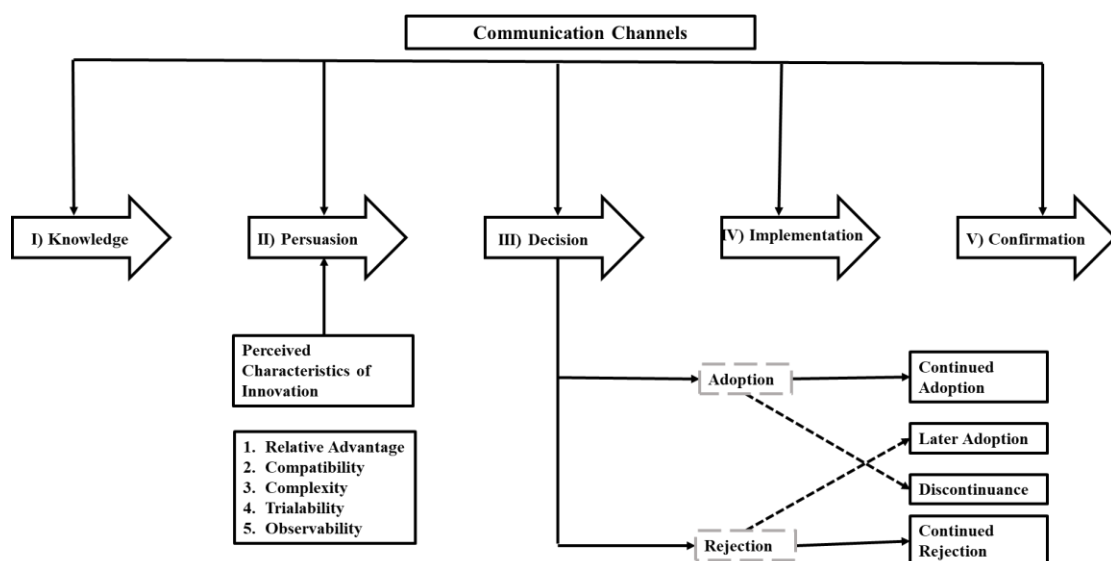
Figure 2.1 Diffusion of Innovation

Since technology advancements keeps transforming, the factor innovation remains constant, thus, the application of this theory is still justifiable in the research of information system. Emergence of mobile application has not yet reached it maturity; therefore, the application of this theory in many studies has been justified from this perspective. For example, Bouwman *et al.* (2008) and López-Nicolás *et al.* (2008) explored the trends of mobile services using DOI. Lu *et al.* (2011) explored the factors influencing behavioural intention to use mobile payment services using two constructs from DOI i.e. relative advantage and compatibility. It was discovered that both determinants significantly influences the behavioural intention to use mobile payment services

Yang *et al.* (2012) examined the effects of behavioural beliefs, social influences and personality traits on mobile payment services adoption using two constructs i.e. relative advantage and compatibility from DOI. Similarly, Chung (2012) reported that behavioural intention towards mobile commerce is significantly influenced by the determinants of DOI namely, complexity, compatibility, observability, trialability and relative advantage. In another study, Ryu *et al.* (2014) analysed the factors affecting application developers' loyalty to mobile platforms in which compatibility was found statistically significant influencing the credibility. In a study by Chen *et al.* (2009) and Pietro *et al.* (2015) reported that compatibility is positively associated with usefulness. However, Ozturk *et al.* (2016) explored the relationship between compatibility perceived ease of use influencing the intention to use mobile commerce. Based on the discussion, it can be concluded that relative advantage and compatibility were predominant exploited factors of DOI in the literature of mobile commerce application.

2.2.2. SOCIAL COGNITIVE THEORY (SCT)

Social cognitive theory by Bandura (1986), presents the essential outlook to examine the reasoning behind the adoption of certain behaviour by individuals. Further, Wood and Bandura (1989) asserted SCT a theory to describe the psychological functions from the perspective of triadic reciprocation i.e. (1) Behaviour (2) Personal and (3) Environmental Factors as engaging enablers to individuals behaviour. It was stated that people contemplate their own behaviour by evaluating the behaviour of their social circle and manipulate their behaviour to take decision accordingly.

A vast number of studies were conducted using this theory to identify people inclination towards certain task that will lead them towards favourable/unfavourable consequences,

thus he defined this ability as *self-efficacy* (Bandura, 1986). "Self-efficacy" is an ability to analyse one's own potential and in which an individual possesses certain abilities in order to perform certain actions. Ratten and Ratten (2007) analysed the behaviour that influences Australian youths towards wireless application protocol banking services based on SCT to support the conceptual framework.
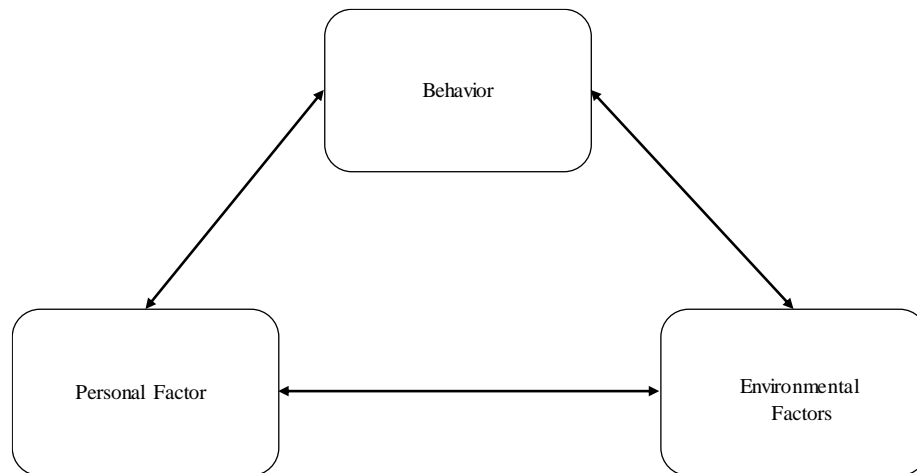
Figure 2.2 Social Cognitive Theories

Similarly, Lin and Huang (2008a, 2008b) integrated the constructs from SCT to explore the factors influencing the knowledge management system. The study reported that self-efficacy and expected outcomes, the employed constructs from SCT found to be statistical significant determinants of usage behaviour. Additionally, Peters (2009) reported that expected outcomes has strong effect on habit, however self-efficacy also has a strong significant influence on expected outcomes towards the intention to adopt. Boateng *et al.* (2016) also noted that behaviour intention of an individual is influenced by social environment, beliefs, and knowledge about specific technology. Hence, to draw a conclusion based on the discussion, it is justified to state that SCT have been served in the body of literature on behaviour intention to adopt technologies.

2.2.3. THEORY OF REASONED ACTION (TRA)

Fishbein and Ajzen's (1975) established the Theory of Reasoned Action that explains individual rational decision-making is highly dependent on the usage of all the information is available. In order to make favourable or unfavourable decision-making, the information is further assessed. Any individual behaviour based on his or her

individual's attitude toward the behaviour and perceived subjective norm predicts the behavioural intention.

An attitude towards behaviour reflects a belief of a person, which directs him or her to specific agreeable or disagreeable outcomes. On other hand, perceived subjective norm states, "an individual is influenced by social environment towards behavioural intentions that successively affects how people perform actions". Studies based TRA theory were explored in almost every area, yet this was also being criticized for its own drawbacks.
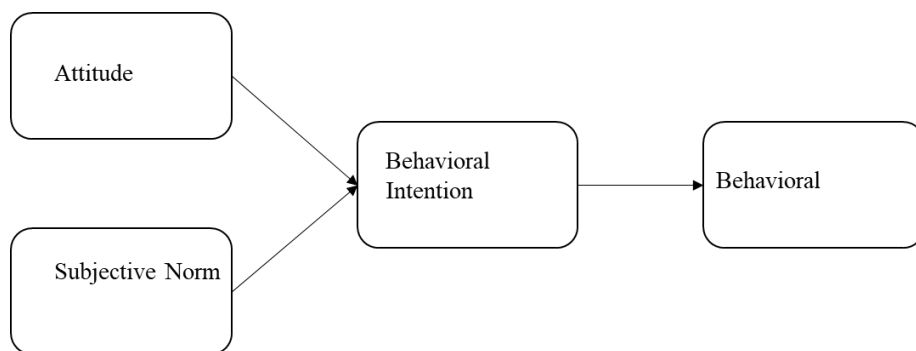
Figure 2.3 Theory of Reasoned Action

In a study by Sheppard *et al.* (1988) reviewed and criticized, that TRA model can predict behaviour not the actual outcome or usage. The study also explained that, if an individual intend to perform an action then there are numerous other extrinsic factors that affect the actions. Thus, it is the belief and attitude together that functions an individual behaviour. The model has been foundation to many studies exploring attitude and behavioural relationships. In addition, several studies revealed well-employed constructs from TRA (e.g., Chen *et al.,* 2009; Yang and Jolly, 2009; Gao *et al.,* 2012; Leong *et al.,* 2013; Lo, 2014).

2.2.4. THEORY OF PLANNED BEHAVIOUR (TPB)

Theory of planned behaviour is an extension of TRA by adding an additional construct i.e. perceived behavioural control (PBC). PBC reflects an individual intentions and behaviour directly. The model have been extensively been used as foundational support in various disciplines such as psychology, sociology (Khalifa *et al.,* 2008). This theory posits that individuals' intentions towards a specific behaviour are predictable through attitude towards behaviour, subjective norms and perceived behavioural control. Based

on this theory plenty studies have been carried out such as mobile viral marketing attitude, Yang and Zhou (2011), mobile banking adoption Aboelmaged and Gebba (2013), factors affecting internet banking adoption Nasri and Charfeddine (2012) and m-commerce adoption Mishra (2014).
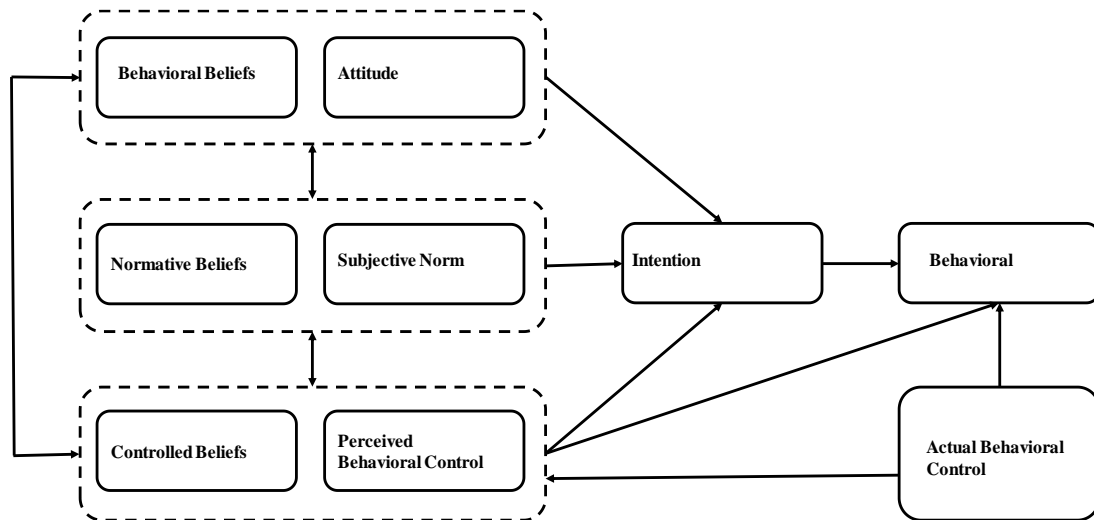
Figure 2.4 Theory of Planned Behaviour

The dimensions of TPB are explained in the following manner:

1. Attitude towards Behaviour

In the process of predicting behaviour when a person's belief reflects favourable or unfavourable outcomes- after an evaluation is termed as "**Attitude Towards Behaviour"**. An attitude influences an individual behavioural intention in order to accomplish a task. Ajzen (1991) stated that an attitude is directly proportional to many beliefs an individual carries. Song *et al.* (2012), in a qualitative study, implemented TPB theory and tried to explain the regional differences amongst the Chinese consumers towards the new mobile technology acceptance. The study derives the dimension of TPB by splitting them into certain themes of individual construct viz. Attitude towards behaviour and this has been categorized as facilitating routines, enhanced lifestyle, fun, status gains and status loss.

2. Subjective Norm

When there is a substantial influence of others on an individual's perception in order to approve or disapprove something it is termed as "**Subjective Norm**". These influences the perception of an individual that can be determined from the social networks viz. family, friends and colleagues. However, studies grounded in this theory have found

this dimension significant in many studies (e.g., Yang and Jolly, 2009; Premkumar *et al.,* 2008 and Wang *et al.,* 2014).

3. *Perceived Behavioural Control*

When an individual overcomes any impediment in order to perform an action, it exhibits a higher degree of perceived behavioural control. Past research studies attempted to find out the relationship of perceived behavioural control on attitude such as mobile applications Gurtner *et al.* (2014), online travel purchase Amaro and Duarte (2015). Whereas, Martín and Herrero (2012) identified the factors influencing online purchase in rural tourism and substituted construct with facilitating conditions in their study. They defined that facilitating condition of UTAUT by Venkatesh *et al.* (2003) is similar to perceived control of TPB.

2.2.5. TECHNOLOGY ACCEPTANCE MODEL (TAM)

TAM established by Davis (1989) which has been considered as widely utilized, robust and parsimonious model in the literature of information system. Davis proposed perceived usefulness (PU) and perceived ease of use (PEOU) to analyse people's attitude and intention to use a specific technology/innovation. It is conceptually based on the theory of reasoned action Fishbein and Ajzen (1975). Therefore, it also postulates the similar outcome what TRA (Attitude→Intention→Actual Use) posits. The theory posits two constructs viz. "perceived usefulness" wherein it means *"it is the degree to which a person believes using a particular system would enhance his/her job performance"* and perceived ease of use *"it is the degree to which a person believes that using a particular system would be free of effort"* Davis (1989) p. 320.
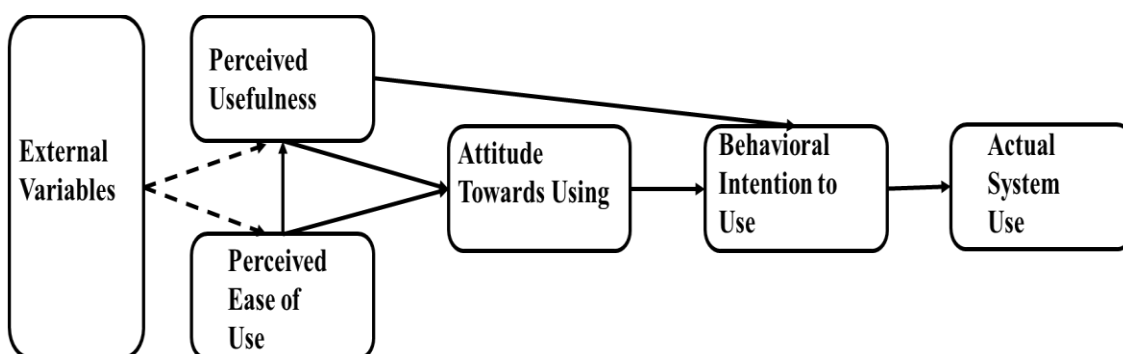
Figure 2.5 Technology Acceptance Model

Many behavioural intention theories have been developed and examined individual's attitude and intentions to adopt any innovation/technology, also observed that most of these theories were social based studied in psychology (Wei *et al.,* 2011). For example, Oh *et al.* (2009) reported the factors affecting the user's perception towards mobile technologies. Likewise, Im and Hancer (2014) explored the factors influences behaviour to use mobile applications. Furthermore, many recent studies have implemented TAM to explore the behaviour intention. Mobile chat services (Nysveen *et al.*, 2005), hotel websites and front office system acceptance (Kim *et al.,* 2008; Morosan and Jeong, 2008), airline website acceptance (Kim *et al.*, 2009), hotel staff m-learning acceptance (Kim and Kizildag, 2011), travel mobile application acceptance (Lai, 2013), consumer generated-media for travel planning (Ayeh *et al.*, 2013) and online purchase behaviour of travellers (Nunkoo *et al.,* 2013), mobile payment (Phonthanukitithaworn *et al.,* 2016).

2.2.6. UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT)

Established by Venkastesh *et al.* (2003), Unified Theory of Technology Acceptance and Use of Technology (UTAUT) was conceptualized integrating eight technology adoption theories namely, Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behaviour (TPB), Combined Theory of Planned Behaviour/Technology Acceptance Model (C-TPB-TAM), Model of PC Utilization (MPCU), Diffusion of Innovation (DOI), and Social Cognitive Theory (SCT). All these theories have been studied and grounded well in many research studies. It also asserts that the individual's gender, age, experience and voluntariness influence the relationship between the intention and usage behaviour.
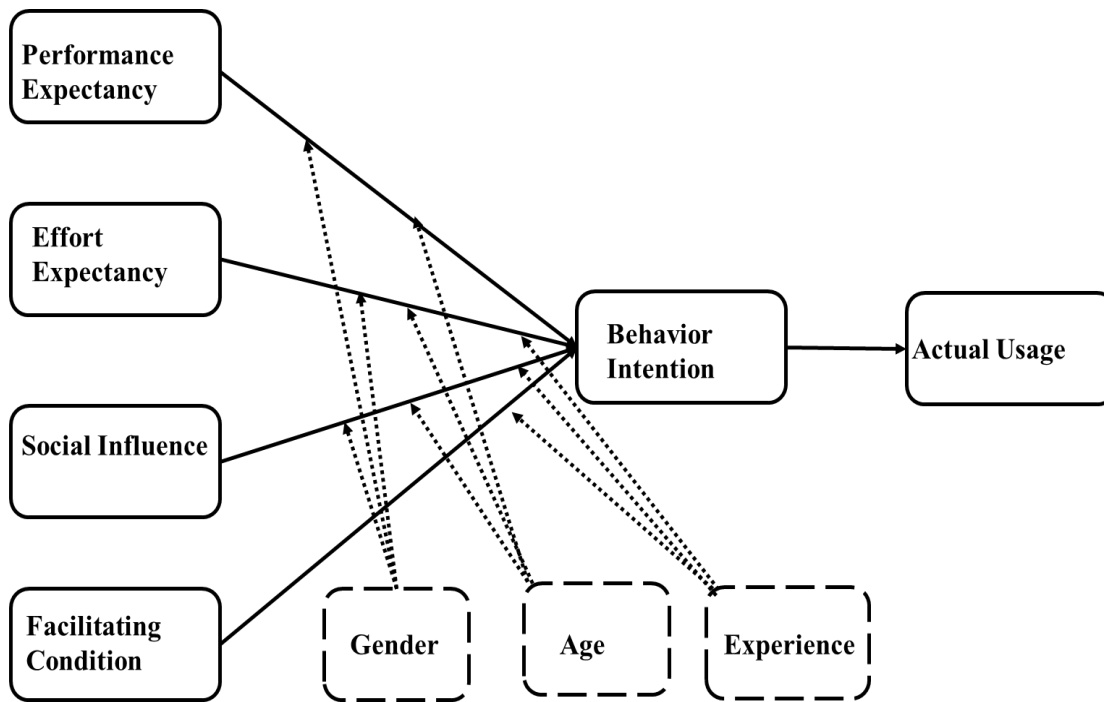
Figure 2.6 Unified Theory of Acceptance and Use of Technology

1. *Performance Expectancy*

   Venkatesh *et al.* (2003) stated, *"The degree to which an individual believes that using the system will help him or her to gains in job performance"*. This dimension is derived from usefulness of TAM and relative advantage of DOI. PE within each individual model is the strongest predictor to measure both in voluntary and mandatory settings.

2. *Effort Expectancy*

   Venkatesh *et al.* (2003) stated, *"The degree of ease associated with the use of the system"*. It has been derived from DOI complexity and perceived ease of use of TAM.

3. *Social Influence*

   Venkatesh *et al.* (2003) stated, *"The degree to which an individual perceives that important others believe the he or she should use the new system*". The construct is similar to the subjective norm of TRA and TPB, as it also explains the influence of social circle of the user.

4. *Facilitating Conditions*

   Venkatesh *et al.* (2003) stated *"The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system"* In a study by Martín and Herroro (2012) reported facilitating condition as a significant

determinant influencing the intentions of the online users. Similarly, another study by Escobar-Rodríguez and Carvajal-Trujillo (2014) also discovered facilitating conditions as a significant factor influencing the intention of online purchasing of low cost carrier tickets. Therefore, it is essential and necessary to study this dimension in order to predict the intention of Mobile-App user.

5. *Behaviour intention and actual usage or use behaviour*

Any individual usage behaviour is being conditional on the intentions of the user to accept the technology. According to theory, behavioural intention directly influences the usage behaviour. There are less number of studies implementing or extending UTAUT. Nevertheless, implication of this observation does not indicate that this theory have been overlooked by the researchers compared to other theories of technology acceptance. Empirically, the theory has carried out substantial results in recent literature throughout culture and contexts. For instance, Lu *et al.* (2008) using UTAUT investigated further reported that facilitating condition and social influence has a significant impact on perceived usefulness. Wang *et al.* (2009) identified the direct influence of performance expectancy, effort expectancy and social influence on behaviour intention to use mobile learning. A study by Xu and Gupta (2009) revealed that performance expectancy and effort expectancy is positively related with behaviour intention.

Meanwhile, Zhou *et al.* (2010) discovered that performance expectancy, social influence and facilitating conditions has significant influence on usage behaviour. Luo *et al.* (2010) explored the relationship between performance expectancy and behaviour intention to adopt wireless banking and found the relationship significant. The study also revealed the significant inverse relationship between perceived risk and performance expectancy. Likewise, Yu (2011) empirically identified performance expectancy and social influence has significant impact on intention to use mobile banking whereas, the relationship between effort expectancy did not played significant role to identify behavioural intention to accept mobile banking.

As suggested by Oliveira *et al.* (2014) also performance expectancy and facilitating condition has indeed positive direct impact on behavioural intention to use mobile banking on contrary effort expectancy on behavioural intention was discovered insignificant due to comfort level and familiarity using mobile devices by Portugal citizens. However, studies based on mobile commerce application have gained attention in the recent years. Predominantly, the focus of the researchers was to identify the

behavioural intention and usage behaviour. Thereby, a study by Jaradat and Rababaa (2013) discovered that key constructs of UTAUT i.e. performance expectancy, effort expectancy, social influence directly influences the behavioural intention except facilitating condition that was found insignificant. In addition, it was reported that behavioural intention is an essential determinant of actual use. The study by Nysveen and Pedersen (2014) supports main results from Jaradat and Rababaa (2013), showing positive impact of key constructs on behavioural intention through the attitude from UTAUT. The study indicated the emerging scope and acceptance for the radio frequency identification (RFID) due to the advent of mobile devices and internet of things.

Dwivedi *et al.* (2015) conducted a study among diabetic patients of USA, Canada and Bangladesh to examine the behavioural intention towards m-health. The results revealed effort expectancy, performance expectancy social influence and facilitating condition significantly influences behavioural intention across three countries. It was suggested that UTAUT is a general model to identify behaviour intention, thus it requires refinement from the consumer behaviour context. The study also discussed the barrier of m-health adoption due to the security and privacy concerns by m-health user.

On the other hand, Madan and Yadav (2016) extended the model by adding two new variables perceived risk and perceived trust to examine the behavioural intention to accept mobile wallets. It was discovered that except effort expectancy, all key constructs had significant influence. The study revealed that risk perception has a negative influence on behavioural intentions, which in case of the study was to identify the mobile wallet acceptance. The results implicate that mobile technologies can be adopted when risk will be lower, thus intention to adopt is higher.

As stated above about the refinement of UTAUT, another study by Afshan and Sharif (2016) also attempted to explore the acceptance of mobile banking acceptance in Pakistan by integrating three established theory along with UTAUT (*task technology fit, initial trust*). The results revealed that except facilitating condition rest three key determinants were insignificant to influence the behavioural intention to accept mobile banking in Pakistan. Meanwhile, initial trust was significantly influenced by performance expectancy and effort expectancy, which implicates that a user's ease of use and utility to use mobile banking will establish the initial trust for behavioural intention. The result also suggested the substantial association of task technology fit

(TTF), initial trust (IT) and facilitating conditions towards the behavioural intention to adopt mobile banking. The reason behind insignificant results for performance expectancy, effort expectancy and social influence was indicated due to the 66% inactive mobile banking users in Pakistan. Another study instead reported performance expectancy, effort expectancy, social influence as strongest predictor, subsequently by risk perception to influence behavioural intention to accept mobile banking among Generation Y college/university students in Malaysia (Tan and Lau, 2016). Based on the discussion it is evidently clear that the application of this model produces distinctive results in various setups. The stated argument presents the rationality behind refining UTAUT because of different empirical findings in the literature.

2.3. PERCEIVED RISK (PR)

Perceived risks are associated with certain harm, danger or uncertainties and subsequent repercussions (Bauer, 1967). The behaviour of consumers gradually takes shape due to the influence of various risks they perceived (Goyal, 2008). It is the risk due to which a consumer cannot project the subsequent repercussions for the purchase they have made such as transaction performed though mobile wallet and uncertainty associated with card details and banking details. E-commerce and m-commerce are highly influenced by various perceived risk, thus they are barriers to accept emerging technologies in the market (Miyazaki and Fernandez, 2001). Likewise, in a meta-analysis conducted by Zhang *et al.* (2012) highlighted that constructs such as perceived trust, perceived risk, perceived cost and perceived enjoyment play an essential role in mobile commerce adoption. Featherman and Pavlou (2003) stated that when a user encounters certain losses while anticipating a value this prompts as perceived risk. Although, all these dimensions are distinctive from each other and necessarily may vary with the nature of the product.

Table 2.1 Dimension of perceived risk

Types of Risks	Operational Definition
Performance Risk	When a product or service fails to provide the perceived benefits of the user (Featherman and Pavlou, 2003).
Privacy Risk	Any loss of identity and confidential information extends such risk perceptions (Featherman and Pavlou, 2003).
Financial Risk	Any monetary loss caused due to bad purchasing, misuse of bank account or credit/debit card details. Users withstand any online or mobile transactions due to such risk perceptions (Featherman and Pavlou, 2003).
Time Risk	Users may experience the loss of potential time while buying any product or service if it does not meet their expected benefits or use. Any technical product/service may extend the time risk in order to learn how to use it (Featherman and Pavlou, 2003).
Psychological Risk	When a user experience a negative psychological risk (disappointment, frustration and shame) of choosing a particular product or service (Derbaix, 1982).
Social Risk	This risk is associated with user's social integrity, damaged image and status within this network (Featherman and Pavlou, 2003).
Overall	When all uncertainties together generates the possibilities of any risk, it is categorised in overall risk of the user perception (Featherman and Pavlou, 2003).

Perceived risks have been empirically tested by many researchers. For instance, Currás-Pérez *et al.* (2013) indicated that entertainment gratifications and perceived risk are two main enablers of attitude towards social networking sites. Meanwhile, Featherman and Fuller (2003) explored the indirect impact of perceived risk towards e-services adoption. The results discovered that, ease of using e-services possibly be inhibited due to higher level of perceived risk. The contemporary utilities of smartphones such as mobile payments, mobile shopping and mobile banking are riskier and prone to hack private information, fraud and malicious attacks. Increased number of such cases has gradually grown due to the utilization of various mobile commerce applications.

Several studies explored the role and influence of perceived risks such as mobile travel guide system (Tsai, 2010), m-commerce (Chang and Chong, 2013), mobile banking (Tan and Lau, 2016), mobile coupon (Im and Ha, 2013), mobile payment (Thakur and Srivastava, 2014; Yang *et al.,* 2015; Sinha *et al.,* 2018). With the growing acceptance of various technologies, travellers are attentive about perceived risks involved mobile

applications. As reported by Sahni (2013), trust and loyalty has negative influence on perceived risk in online banking, it can be implicated that when loyalty and trust are high, the risk will be perceived low. In addition, the association of website quality and perceived risk was found negatively associated towards online shopping intention (Kim and Lennon, 2013).

Although, only few studies have explored the influence of perceived risk towards usage of mobile applications, Lin *et al.* (2009) discovered that privacy risk and privacy risk inhibit the online purchase of travel products by Taiwanese. On the other hand, Lee (2016) asserted that perceived risk and perceived trust along with other key constructs such as ease of use, usefulness, social influence, perceived behavioural control influences the traveller web-based Self-service technology adoption. In a literature review on online travel purchasing conducted by Amaro and Duarto (2013), it was recommended that perceived risk have significant influence on online purchase of travel of products. The study also emphasized on the observed factor that has indirect effect on online travel purchasing i.e. perceived trust. The study also discussed that perceived trust has a positive influence on perceived risk and security issues have been explored in few studies that influences online purchase intention of a traveller. The discussion subsequently indicates that perceived risk may inhibit the travellers to use Mobile-App. Based on the previous research in this area, it is rationale to assume that perceived risk is a key factor to examine that influences the traveller intention to use mobile application. However, it has been investigated as single construct, limited knowledge is available that has explored the multidimensional effect on Mobile-App usage context (Zhou, 2012). As a result, the current study attempts to examine the influence on usage behaviour of Mobile-App in India

2.4. USES-AND-GRATIFICATIONS

The present scenario of technology manifested the swift flow and changes in internet services and mobile devices. It has taken the conventional mass media to the new heights of communications. Formation of attitude towards the adoption of any media communication is directed by the psychological needs of an individual (Yang, 2013). It is one of the early theories in media consumption is uses-and-gratifications (U&G) theory. The theory describes the motivation of an individual that 'how', 'why' and 'what' influences them to adopt a particular media. However, it was primarily established to investigate the components of conventional media (Haase and Young,

2010). The theory in the recent years has gained attention by researchers by integrating it with existing technology adoption models in order to identify the behavioural intentions and usage.

With the emergence of mobile technologies as discussed in chapter 1 sub-sections 1.2. and 1.2.1 travelling and hospitality sector is witnessing a significant rise in Mobile-App user base in India. In a survey conducted on Indian travellers it was revealed that more than 60 percent travellers using Mobile-Apps for hotel booking, social networking, navigation, payments, and ticketing. In addition, it was also observed that individual's research competencies are widening with the prominent usage of Mobile-Apps and facilitating them with meticulously thought-out plans based on reviews/feedbacks/ratings (IBEF, 2018). Based on the above discussion, the current study assimilated majority of the Mobile-Apps being used for travelling purposes. Hence,

it is essential to examine that what particularly motivates traveller to choose Mobile-Apps.

The hedonic motivations of users to choose various platforms to communicate, search information and so on have been empirically reported (Leung and Wei, 2000). In a study, suggested by Venkatesh and Davis (2000), acceptance of mobile services are extremely motivated and influenced by the expression of one's own status. Nevertheless, technology adoption theories strength to explain the behavioural intentions and usage behaviour is confined to its explained variance around 40 percent (Venkatesh and Davis 2000). As a result, a large number of extended models have been examined in the literature of technology adoption. Similarly, the current study also identified the gap in UTAUT, wherein it lacks to explain the hedonic motivations to use a particular technology. Hence, in the current study context the investigation to identify the motivation to use Mobile-App is integrated to study the indirect effect of uses and gratification on Mobile-App usage behaviour. A study by Stafford and Gillenson (2004) examined the motivations to use mobile devices.

The results revealed that the virtue of speed and connectivity gratifies a mobile device user. Similarly, Roy (2009) assessed the people motivations behind the usage of internet services in Indian context. In another study, Phua *et al.* (2017) reported various gratifying parameters using Facebook, Instagram or SnapChat, Twitter. Several studies invariably explored the significance of this theory in order to investigate the gratifications behind a chosen media component by a user. For example, Smartphone

Usage (Joo and Sang, 2013), Web-based Information (Luo and Remus, 2014), Social Media Usage and Online Marketing (Richard *et al.,* 2013; Gao and Feng, 2016), Mobile Applications (Chen *et al.,* 2015), Social Media Marketing In Hotel Industry (Choi *et al.,* 2016), life span of tablet computer in older adults (Magsamen-Conrad *et al.,* 2015), continuation of WeChat amongst Chinese citizens (Gan and Li, 2018), social media usage by travellers (Aluri *et al.,* 2016). Luo and Remus (2014) suggested that despite the existing technology adoption frameworks, a rigorous development is imperative to examine the motivation to adopt these evolving technology advancements. The emerging trends in information technology specifically have been increasingly using U&G to investigate the contemporary adoption.

2.5. CONCLUSION

The current chapter illustrates the comprehensive literature review on existing technology adoption theories. The chapter also provides insights of other two theories that were used to develop the conceptual framework moderators i.e. *perceived risk and uses-and-gratifications*. Literature review conducted in the area of travelling and hospitality and various mobile commerce application adoptions was discussed in this chapter apart from chapter 1. The comprehensive review of previous work in the domain of mobile commerce and integration of these three theories has been discussed with their justifications. The highlighted studies discussed in each theory indicated that very few studies have been conducted in Indian context as well travelling and hospitality also. The association between risk perception and uses and gratification was used to examine the influence of typology and consider them as enabler and inhibitor of Mobile-App usage in the study.

CHAPTER 3
CONCEPTUAL FRAMEWORK

3.1. INTRODUCTION

This chapter discusses comprehensively the proposed research hypotheses and their conceptual association with each other. In order to achieve the same, a review of various technology adoption theories has been discussed in chapter 2. A detailed literature review has indeed provided the directions to borrow the constructs that helps to identify the research gaps for the current study. Further, the chapter manoeuvres the discussion of constructs of the proposed conceptual framework. The sections in the chapter are followed by the development of the research hypotheses directed primarily by the conceptual framework and the empirical results of the study.

3.2. CONCEPTUAL FRAMEWORK

Based on chapter 2, the conceptual framework (Figure 3.1) was developed post identifying the research gaps. The conceptual framework primarily conceptualized from a broader perspective i.e. Unified Theory of Technology Acceptance and Use of Technology (UTAUT) (Venkatesh *et al.,* 2003), Risk Perceptions (Featherman and Pavlou, 2003) and Uses-and-gratifications (Stafford and Stafford, 2003). Implementing UTAUT, RP and U&G is consistent to the research gaps proposed in the present study. According to Im and Hancer (2014), it is imperative for practitioners to understand the distinctive characteristics, behavioural intentions and usage of mobile technologies by travellers. Mobile applications for travelling these days are heavily used to search any information, to book tickets *(air tickets, railways, bus ticket)*, social media networking app to share and read experiences, to navigate during trips *(google maps)* and so on and so forth (Yang, 2013). Therefore, motivations to use mobile application is not only limited to its satisfaction but also to the perceived risks associated with it. With the gradual growth of the literature in this area, it indicates that studies based on behavioural intentions have not been able to capture the actual usage of Mobile-App. Thus, it becomes necessary to explore the usage of travelling mobile applications of travellers. Despite of the extensive literature on mobile technologies, there is still a scarcity of academic research attempted to study the usage of Mobile-App and traveller profiling based on risk and gratifications in travel and hospitality sector. The conceptual

framework provides the layout to study the mobile application usage behaviour of travellers and moderating influence of traveller profiles, age, gender and experience of using mobile applications. The components of the conceptual framework given in Figure 3.1 were already discussed in detail in chapter 2 sub-section 2.2.6, 2.3 and 2.4 respectively.

The research gaps further were classified into three parts: firstly with conceptualization of the framework *(to examine the predictors that influence traveller's Mobile-App usage behaviour).* In addition to this, the literature also indicated that typography of the mobile application users also influences the usage behaviour. Thus, this study also established the typologies of the travellers based on risk perceptions namely *performance risk (PR), financial risk (FR), privacy risk (PRIR), social risk (SR), time risk (TR), psychological risk (PSYR) and uses-and-gratifications namely promotion gratifications (PG), functional gratifications (FG), social gratification (SG) and entertainment gratification (EG).* Lastly, the third part exploring the influence of moderator characteristics viz. age, gender, experience and typology on the usage behaviour, specifically how traveller's typology influences the Mobile-App usage behaviour was the key contribution.
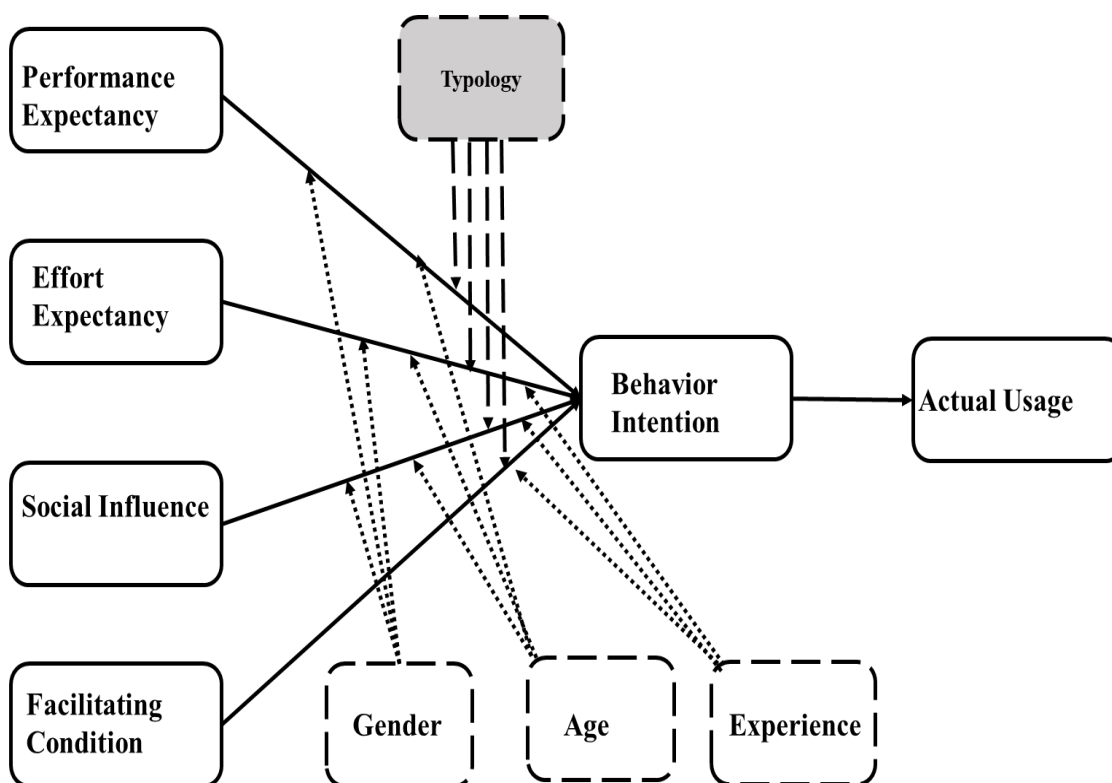
Figure 3.1 Proposed Conceptual Framework

3.3. HYPOTHESES DEVELOPMENT

A hypothesis is an exemplification of a logical presumption or speculation between any two or more variables in the form of testable statements. *"A hypothesis can be defined as a tentative, yet testable, statement, which predicts what you expect to find in your empirical data"* (Sekaran and Bougie, 2016). In other words, the development of the hypotheses are either based on previous empirical findings or existing theoretical frameworks in the literature of respective area. Predominantly, the researcher established the hypotheses based on the conceptual framework proposed by him/her. For the current study, the research hypotheses developed were consistent with the stated research objectives in chapter 1.

Therefore, the study investigated the mobile application usage behaviour of travellers and the moderating influence of typology as well as demographics. Table 3.3 presents the brief description of the research objective and research hypotheses based on them.

Table 3.1 Research objectives mapping research hypotheses

Research objective	**To examine factors influencing Mobile-App usage behaviour**
Research hypotheses	*H1: Performance Expectancy (PE) has a significant positive effect on behavioural intention (BI) of travellers to use Mobile-App*
	H2: Effort Expectancy (EE) has a significant positive effect on behavioural intention (BI) of travellers to use Mobile-App
	H3: Social Influence (SI) has a significant positive effect on behavioural intention (BI) of travellers to use Mobile-App
	H4: Facilitating Condition (FC) has a positive significant effect on Mobile-App usage of travellers
	H5: Behavioural Intention (BI) has a positive significant effect on Mobile-App usage of travellers
Research objective	**To study moderating influence of travellers typology based on their uses-and-gratifications and risk perception**
Research hypotheses	*H1c: Influence of Performance Expectancy (PE) on Behavioural Intention (BI) is moderated by typology*
	H2d: Influence of Effort Expectancy (EE) on Behavioural Intention is moderated by typology

	H3d: Influence SI on Behavioural Intention (BI) is moderated by typology *H4a: Influence of Facilitating Conditions (FC) on Mobile-App usage is moderated by typology*
Research objective	**To assess the influence of demographics (age, gender, experience) on Mobile-App adoption behaviour**
Research hypotheses	*Age* *H1b: Influence of Performance Expectancy (PE) on Behavioural Intention (BI) is moderated by age* *H2b: Influence of Effort Expectancy (EE) on Behavioural Intention (BI) is moderated by age* *H3b: Influence of SI on Behavioural Intention (BI) is moderated by age* *H4b: Influence of Facilitating Conditions (FC) on Mobile-App usage is moderated by age*
Research hypotheses	*Gender* *H1a: Influence of Performance Expectancy (PE) on Behavioural Intention (BI) is moderated by gender* *H2a: Influence of Effort Expectancy (EE) on Behavioural Intention (BI) is moderated by gender* *H3a: Influence of SI on Behavioural Intention is moderated by gender*
Research hypotheses	*Experience* *H1c: Influence of Effort Expectancy (EE) on Behavioural Intention (BI) is moderated by experience* *H2c: Influence of SI on Behavioural Intention (BI) is moderated by experience* *H3c: Influence Facilitating Conditions (FC) on Mobile-App usage is moderated by experience.*

3.3.1. Independent variables

In order to determine the usage behaviour of a traveller based on UTAUT framework, four key constructs were employed in the current study: performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC) followed by demographics such as age, gender, experience and voluntariness. Wherein, voluntariness in case of the present study was omitted. The establishment of UTAUT mainly examined the users in workplace setting, where voluntariness of technology may or may not be as per the user requirement and desire. In addition, the usage of smartphones and its respective functional facets for travelling purpose is voluntary in nature. Therefore, it was irrelevant to capture this variable in this study, as the travellers who uses the Mobile-App install them as per their requirement and convenience.

1. *Performance Expectancy (PE)*

    Performance expectancy is associated with the aid in performance for a user while implementing or utilizing any new technology; this is similar to perceived ease of use (TAM) and relative advantage (IDT). It identified the behavioural intention of a user, which in turn is a key determinant in describing consumer behaviour in the recent mobile application research. Venkatesh *et al.* (2003) defines it as *"The degree to which using a technology will provide benefits to will help him or her to attain gains in job performance"*. This was considered as the strongest determinant of behavioural intention. Previous studies have explored the relationship between performance expectancy and behavioural intention providing support for the significance of this construct (Zhou *et al.*, 2010; Im *et al.*, 2011; Khalilzadeh *et al.*, 2017). Whilst in the context of travelling for a Mobile-App user, PE indicated the quantum of benefits a traveller experiences while using them. Studies have documented that performance expectancy is the utilitarian attribute which positively affects the traveller's intention to use technology (Escobar-Rodríguez and Carvajal-Trujillo, 2014; Morosan and Defranco, 2016). Therefore, the degree of performance expectancy positively affects behavioural intention and leads to the formulation of the following research hypothesis for the present study:

H1 PE→BI: *Performance Expectancy (PE) has a significant positive effect on Behavioural Intention (BI) of travellers to use Mobile-App*

2. *Effort Expectancy (EE)*

This determinant reflects the user's perception towards the level of difficulty of using technology. It was derived from existing models, such as Complexity (IDT) and perceived ease of use (TAM/TAM2) (Venkatesh, 2003). In the context of Mobile-App for travellers, Effort Expectancy affects the traveller behaviour during the initial stages of the usage. Researchers examined Effort Expectancy in the context of various technologies acceptance (No and Kim, 2011; Lai, 2013; Hew *et al.*, 2015; Madan and Yadav, 2016). It has been clearly validated that EE plays a vital role in technology acceptance. This provides a clear indication that the ease of using a technology is essential to examine the traveller's behaviour to use a Mobile-App. In other words, when a traveller feels that using mobile applications is effortless and easy to use, he/she perceives a high expectation for better performance, otherwise the PE will be low for the traveller. In addition to this, there will also be a moderating effect of gender, age, experience and traveller typology on Effort Expectancy. Thus, a traveller's ability to use a mobile application for travelling purposes could be viewed as elementary in the development of behavioural intention (Dwivedi *et al.*, 2015) and the research hypothesis for the current study context is:

H2 EE→BI: *Effort Expectancy (EE) has a significant positive effect on Behavioural Intention (BI) of travellers to use Mobile-App*

3. *Social Influence (SI)*

The impact of Social Influence (SI) is defined by the extent to which a user perceives the amount of acknowledgment and approval by the members in his/her social network. It has been suggested that SI is an elementary aspect for people to make decisions when it comes to accepting new information system/technology (Davis, 1989; Venkatesh, 2003). It has been captured through various theories such as TAM2, theory of planned behaviour, 1991 (TPB) and IDT. In the context of a voluntary setting, SI has an indirect impact on intention via utilitarian and pragmatic benefits. The reason behind intention of an individual is affected by social influence is due to the mandatory concurrence in behaviour acceptance. In addition to this, the influence of this on behavioural intention increases as a user grows older, which was also been supported in UTAUT by (Morris, 2000). In the context of Mobile-App, travellers tend to install them after the recommendation or shared experiences by

their family, friends, colleagues or travellers on social networking platforms (Kim *et al.*, 2011; Yang, 2012). Thus, the research hypothesis for the current study context is:

H3 SI→BI: *Social Influence (SI) has a significant positive effect on behavioural intention of traveller to use Mobile-App*

3.3.2. *Influence of Behavioural Intention on Mobile-App usage (BI→BU)*

The dependent variables of UTAUT framework are behavioural intention and usage behaviour. According to theory, behavioural intention (BI) directly influences the eventual usage (BU) behaviour. Any individual usage behaviour is being conditional on the intentions of the user to accept the technology or vice-versa. In the context of Mobile-App usage by travellers, behavioural intention for the current study was measured based on the intent a traveller expressed to use it. In order to measure the Mobile-App user behaviour, frequency of using Mobile-App for travelling and hospitality purpose was asked in terms of searching information, performing payments, reading and writing reviews on Mobile-App. Intentions of consumers have been extensively explored and reported, that play an imperative role in shaping the usage behaviour and acceptance for new technologies. Similarly, this relationship has also been explored in the current study to identify the actual use through behavioural intention. With the advancement of various information technologies, the focus of researchers have been active on the digital divide. Thus, behavioural intention is an imperative determinant to study intention and actual usage. Higher the behavioural intention to accept a new technology, higher will be rate of adopters along with the recommendations in the social system (Miltgen *et al.*, 2013; Leong *et al.*, 2013; Tan *et al.*, 2016; Alawan *et al.*, 2017). The current study consequently proposes the research hypotheses:

H5 (BI→BU): *Behavioural Intention (BI) has a positive significant effect on Mobile-App usage of traveller*

3.3.3. *Influence of Facilitating Conditions (FC) on Mobile-App usage (FC➔BU)*

Venkatesh *et al.* (2003) reported that facilitating conditions are *"the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system".* The construct was derived from compatibility of IDT and perceived behavioural control of TPB. Many studies described the significance of this construct and the relevance of support system to adopt new technologies efficiently (Zhou *et al.*, 2010; Yu, 2012; Lai, 2013; Alalwan *et al.*, 2017). Therefore, this demonstrated that Mobile-App users are proactively interested towards the existing facilities that are available such as high-speed internet (mobile data or wireless), secured and user-friendly Mobile-App and advanced smartphones or mobile devices that support various mobile applications while travelling.

Findings from various studies examined this construct, defining the relevance of a support system for any technology adoption (Al-Gahtani *et al.*, 2007; Chen, 2013; Nysveen and Pedersen, 2014; Escobar-Rodríguez and Carvajal-Trujillo; Alalwan *et al.*, 2017). In addition, many studies have reported that facilitating conditions have shown non-significant impacts on actual usage (Chong, 2013; Barnett *et al.*, 2015). From the perspective of the current study, the availability of an aid which allows the traveller to seek different information and the required support of access and use of mobile applications when needed, such as reviews shared on various travelling app, destination navigations, FAQs, itinerary information and so on. In addition to this, travellers lifestyle also influences the facilitating condition where his/her perception towards usage of mobile application matters. Therefore, in an attempt to identify those conditions related to actual use of Mobile-App by travellers it is proposed that:

H4 FC➔BU: *Facilitating Condition (FC) has a positive significant effect on Mobile-App usage of traveller*

3.3.4. Moderating variables

1. Age

Age has been an important indicator to predict demographics while identifying the technology acceptance of a user (Gurtner *et al.,* 2014). Although in the early stages of research in the context of information technology, little attention was given (Morris and Venkatesh, 2000). Consequently, studies later explored the significance of the effect (direct or indirect) on user acceptance and usage behaviour. In the previous research, it

was also reported that younger generation is less likely to find it difficult to accept new technology evolution (Venkatesh *et al.,* 2003; Chung *et al.,* 2010; Yang *et al.,* 2010; Chung, 2014; Ghaderi *et al.,* 2018). In the current study context, age plays an important role, as most of the traveller using Mobile-App are young adults from various occupations such as students, professionals working in multinational companies, scholars, and travel bloggers/vloggers so on. In several studies, it was reported that young travellers are more likely adopt new technologies than the older generation aged from 40 years and above. Moroson and DeFranco (2016) reported that youth in the age category of 20 to 26 years were likely to be very efficient tech savvy and possess high behavioural intention towards acceptance of the mobile payments. A similar study by Lai, 2013 also supported that traveller half of the respondents in the survey were in the age category of 20 to 29 years old this explains clearly that it is essential to examine the moderating role of age for travellers using Mobile-App. Thus, the following sub hypotheses were established:

H1b: Influence of Performance Expectancy (PE) on Behavioural Intention (BI) is moderated by age

H2b: Influence of Effort Expectancy (EE) on Behavioural Intention (BI) is moderated by age

H3b: Influence of SI on Behavioural Intention (BI) is moderated by age

H4b: Influence of Facilitating Conditions (FC) on Mobile-App usage is moderated by age

2. Gender

Gender has been widely considered as significant demographic predictor in the literature of technology acceptance (Nysveen, 2005). Substantial amount of literature has reported the relevance of gender as an important indicator to identify a user intention from gender perspective (Riquelme and Rios, 2010). Both male and female perceived and reacted differently towards the acceptance of new technologies. Males with higher education tend to be more likely to adopt new technologies than females (Lee, 2011). Yang and Lee (2010) discovered that utilitarian value was significantly higher in males than females in using mobile data services. Further, many studies (Venkatesh and Morris, 2000; Cho *et al.,* 2003; Wang and Wang, 2010; Lee, 2011; Leong *et al.,* 2013; Liébana-Cabanillas *et al.,* 2014) also reported evidence in supporting that there was a

difference of perception and reaction between males and females. Moreover, Chung, (2014) observed mixed reactions towards mobile commerce adoption at the same time discussed contrary observations by other studies, where females have shown inclination towards new technologies than males. Therefore, based on contextual discussion the following research hypotheses developed for the current study:

H1a: Influence of Performance Expectancy (PE) on Behavioural Intention (BI) is moderated by gender

H2a: Influence of Effort Expectancy (EE) on Behavioural Intention (BI) is moderated by gender

H3a: Influence of SI on Behavioural Intention is moderated by gender

3. Experience

User experience as a variable have been examined in various context (Chatterjee and Kar, 2017). Various perspectives have been identifying the direct and influence of user experience. As far as technology adoption or digital platform consumption was concerned, this variable played significant role. It assisted to evaluate the level of experience by a user towards a specific technology. As a result, this provided the information and understanding of the user's familiarity and expertise of the technology he/she utilize. Chen *et al.* (2011) tested and found the significant moderating impact of user experience influencing the use mobile phones to play games. On contrary, Lee and Mills (2010) discovered the significant direct relationship of technology experience predicting perceived satisfaction and perceived value. Another research conducted by Li *et al.* (2012) identified that user consumption experience is significantly dependent on hedonic factors related to emotions. This indicated that a consumer prefer to consumer service where his/her particular hedonic motivation is served that further influences his/her experience of using m-commerce services. According to research published previously, it was stated that people who are familiar and experienced with technology shows higher level of trust and security. As a result their perceived risks will be lower and satisfaction will be higher (Liébana Cabanillas *et al.,* 2014). Thus, based on the discussion it can be rationally conclusive, it is equally important to examine the role of traveller experience in terms of using Mobile-App. The following proposed research hypotheses developed for the current study:

H2c: Influence of Effort Expectancy (EE) on Behavioural Intention (BI) is moderated by experience

H3c: Influence of SI on Behavioural Intention (BI) is moderated by experience

H4c: Influence Facilitating Conditions (FC) on Mobile-App usage is moderated by experience

4. Customer typology

This is the key contribution to the study, in which the moderating variable is identified based on risk perceptions (Featherman and Pavlou, 2003), uses-and-gratifications (Stafford and Stafford, 2003), further named as travellers typology. Typology in current study context, defines the profiles of the travellers grouped together sharing similar likes and dislikes towards using travelling app. Despite the high intention to use Mobile-App, there are certain technical hindrances (*risks*) that inhibits the user to continue the usage (Chahal *et al.,* 2014). Similarly, certain gratifying factors remain unexplored as influencers that satisfies (*gratifiers*) the Mobile-App user. Usually there is a trade-off by the user influenced either by inhibitor *(risk)* or by driver *(satisfaction).* As discusses by San Martín *et al.* (2013) that typologies based on inhibitors and drivers have not been explored as moderators, as they can specifically identify the user's profiles who are sharing similar interests and disinterests towards a particular product or service. Literature indicates that few studies have attempted to explore this variable in terms of identifying direct/influence or explored only inhibitors, drivers or few have explored both. For example, Teo and Pok (2003) worked on inhibitors (*perceived risk*) and drivers borrowed from technology adoption theories. Pagani (2004) discovered inhibitor (*price*) and drivers (*speed of use and relative advantage*) of mobile shopping. Wu and Wang (2004) examined the inhibitors (*cost and perceived risk*) and drivers (*compatibility*) of mobile shopping. San Martín and Camarero (2008) discovered that while development of trusts observed differences among the different types of users as per their drivers and inhibitors. Based on the above discussion, the following hypotheses were formulated:

H1c: Influence of Performance Expectancy (PE) on Behavioural Intention (BI) is moderated by typology

H2d: Influence Effort Expectancy (EE) on Behavioural Intention is moderated by typology

H3d: Influence SI on Behavioural Intention (BI) is moderated by typology

H4a: Influence of Facilitating Conditions (FC) on Mobile-App usage is moderated by typology

3.4 CONCLUSION

The current chapter summarizes and discusses the conceptual model and its interrelationships among constructs. It also provides an insight into the significant association between the factors influencing the behavioural intentions and behaviour usage. Further, the chapter also explains the proposed research hypotheses in detail in the context of Mobile-App users. The hypotheses construction was based on various variables included in the conceptual frameworks with their direct effects and indirect effects as well in terms of moderating influences. Post the discussion on research hypotheses the next chapter further discussed in brief regarding the research methods and various techniques and tools employed in the current study followed by their results in the chapter 5.

CHAPTER 4
RESEARCH METHODOLOGY

4.1. INTRODUCTION

Research methodology helped in implementing the research process systematically in order to achieve the aims of the study. It also helps to understand the proposed scientific query and the process to analyse them. This chapter provided an overview on the objectives of the study in detail and analyse the research techniques implemented in order to meet the discussed objectives. Further, the chapter is followed by Section 4.2 that explains the adopted research methodology of the current study, then Section 4.3 briefly illustrates about how preliminary and main study conducted. Henceforth, sections provided a comprehensive interpretation about the population, sample selection strategy utilized in the study and the procedures of the data collection for the preliminary and main study.

4.2. RESEARCH DESIGN

The primary objective of this study was to examine the adoption behaviour of mobile applications in the context of travelling and hospitality. Specifically the study focused on understanding influence of customer of typology of mobile-app adoption in the stated context.

The research process adopted in the current study is as listed below:

1. The extensive literature review was conducted to develop the propose framework
2. To identify research gaps in order to create the conceptual framework for the research. Conceptualization was based on the identified research gaps with the help of extensive literature review.
3. Research hypotheses were developed within the ambit of the conceptual framework.
4. A preliminary study conducted to test the reliability and validity of the instrument.
5. The research instrument was refined after the preliminary study
6. Data was collected using cross-sectional survey method.
7. Identification of customer typology based on cluster analysis
8. Data analysis conducted: EFA, CFA, Cluster analysis, Structural Equation Modelling (SEM)
9. Results of the analysis were evaluated and findings were summarised
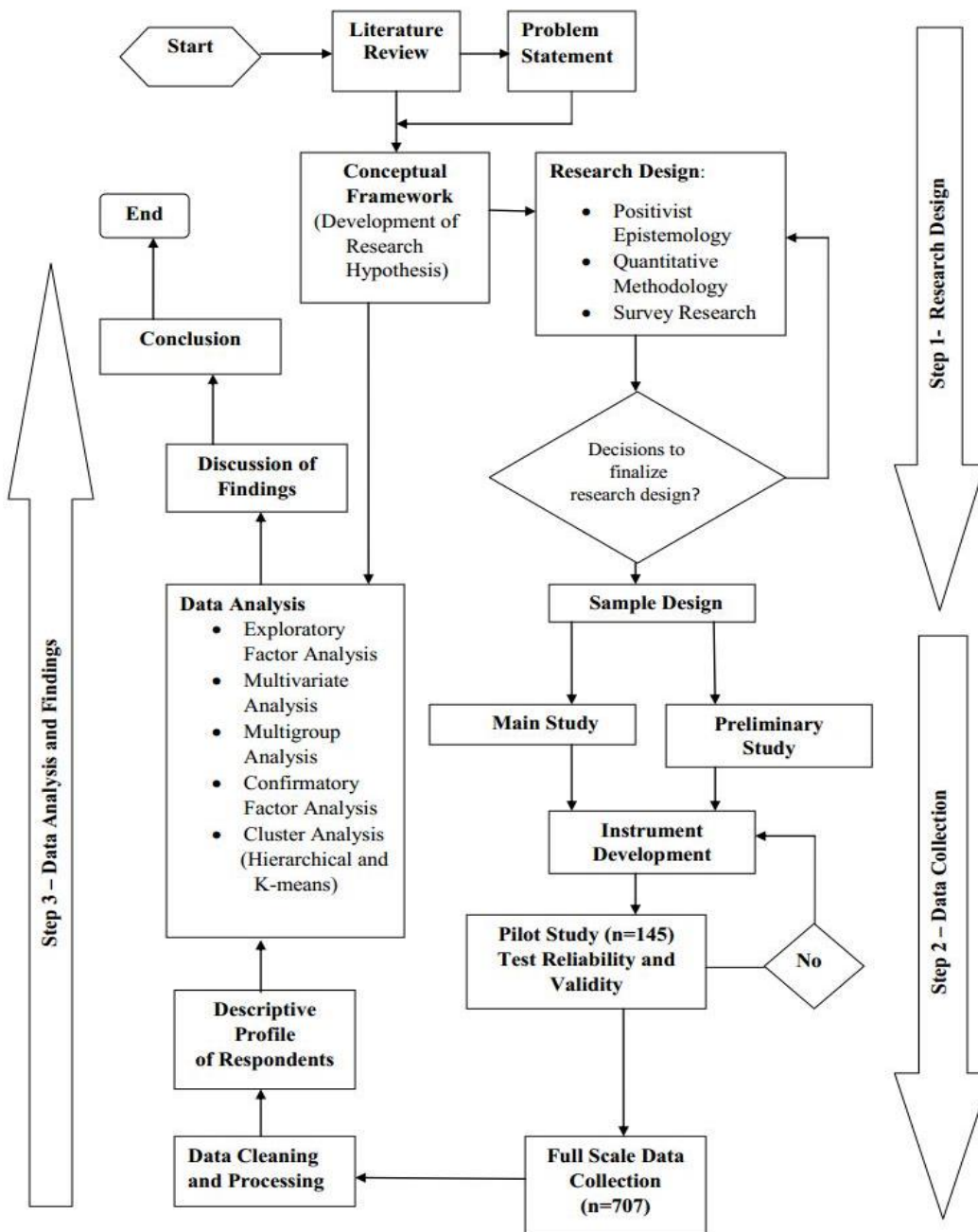
Figure. 4.1 Research design adopted in the present study

Research design was a blueprint or a systematic approach specifying various methodological procedures that have been adopted in order to design instrument, collect and analyse the data for the desired or defined objectives. In other words, it integrated the process of what was relevant to a researcher's purpose for the study and the procedural arrangements designed for it. In the literature, research design has been defined in various comprehensive as well simpler ways such as *"the Research Design*

is the blueprint for fulfilling objectives and answering questions" Cooper and Schindler (2014). Moreover Zikmund *et al.* (2013) defined *"Research Design is a master plan that specifies the methods and procedures for collecting and analysing the needed information".* It can be stated that research design demonstrate the track of research activities. Nevertheless, in order to achieve the objectives the research design was primarily dependent on the research problem of a domain within a study. Further, research design can be classified into the exploratory, descriptive and causal research or explanatory studies respectively (Malhotra and Das, 2009).

4.2.1. Exploratory research

Often when there was a requirement to seek new insights, assess them and bring development exploratory studies were preferred for investigation. The researchers conduct studies with the help of surveys or qualitative research tools. These studies help researchers to gain new observations, conclusions and establish fundamentals to foster investigations. It was also known as domain of discovery for new phenomena's in scientific philosophies or in nature and required to develop testable research hypotheses from new the ideas. Primarily exploratory research can be conducted with the help of three techniques i.e. Survey Method, In-Depth Interviews (expert of the domain) lastly focus Group Interview (Zikmund *et al.,* 2013).

4.2.2. Descriptive study

Unlike exploratory, Descriptive studies were more formalized and were mostly structured, there were clearly defined hypotheses or research questions. It serves variation of research objectives to identify phenomena addressing who, what, when, where and how of a particular domain while estimating the proportion of population that has these characteristics. The descriptive studies explored the association among various variables (Cooper and Schindler, 2014). Predominantly social researches were conducted under descriptive studies in order to explore and discover the phenomena with suitable research methods.

4.2.3. Causal research

Causal or exploratory research identifies the cause and effect relationships amongst variables. Findings of causal research were very significant and powerful because they lead to greater control. Descriptive research foundation were established with the help

of exploratory studies which establishes the groundwork for causal research. Therefore, while taking causal research, researchers generally have a sound knowledge and expertise of the phenomena's being investigated. By virtue of this, the researchers can provide rational predictions about the cause and effect relationships to be tested. Moreover, such research designs may consume a lot of time to execute and implement as well as expensive due to their intricate designs.

4.2.4. Research philosophy

Research philosophies were imperative elements of the philosophy of knowledge. It was technically classified into three essential categories namely, Epistemology, Ontology and Axiology. Where, Epistemology approach deals with what we can know or what we know about things, on the other hand Ontology deals with illustrating things and their relationships to explore answers to the question such as "what is..?". Ontology deals with the natural realism whereas Epistemology concern was with nature of knowledge also to investigate the ways that a researcher think. Last branch of philosophy i.e. Axiology approach was to answer the beneficial, desirable or valuable things. Therefore, the purpose of it is to identify the value of everything, therefore also popularly called as "value theory" or "theory of value". In other words, Axiology investigates how various people determine the value of things or judgments. These research philosophies were research paradigms that reflect upon the belief of a researcher or scholar in a particular domain. They enabled and influenced a researcher where he/she can identify what should be investigated, how it should be investigated and how the findings of the study should be illustrated. Thus, they are essential to constitute and shape how a researchers lens through the domain of research in the world, interprets and acts within that domain. In other words, it can also be considered as researcher's point of view or his/her looks at the area of focus to examine objectives, methodological and data analysis aspects to be identified for the chosen study.

The dominant research paradigms in the philosophy are categorized into three taxonomies, namely positivist, interpretivist or constructivist and critical. Although a large number of research paradigms have already been proposed, of which the fourth has also been introduced wherein the elements have been borrowed from these three paradigms and is known as pragmatic paradigm (Tashakkori and Teddlie 2003a; 2003b; Guba and Lincoln, 1994; Lincoln and Guba, 2000). The objective of this study is not to capture experiences of the respondents rather to identify behavioural patterns that can

be measured, positivist research paradigm employed to achieve the mentioned purpose. In other words, the process of experimentation in which various scientific methods were involved to explore different observations in order to answer research questions was purely a positivist approach of research paradigm. It establishes the research hypotheses, testing the research hypotheses, providing mathematical equations, operational definitions and calculations to draw conclusions.

4.2.5. Research approach: Qualitative vs Quantitative

To begin with, research choices are technically of two types, namely, qualitative and quantitative. They are differentiated based on the type of data in terms of numeric data and non-numeric data and nature of knowledge (Zikmund *et al.,* 2013). Selecting a particular research choice is an essential decision making by a research as the entire data collection techniques and analysis to-be used in the study. When required to explore and understand the phenomena's of culture and social system researchers preferred qualitative research methods. On the contrary, quantitative study are grounded in natural sciences to investigate the natural phenomena's and both are conducted in the field of education. Despite the fact that they are distinguish with each other, yet there is no evidence that can validate one is better than other; rather the suitability as per the context of the study, its purpose and the nature of the research questions determines which method would be suitable to use. In some exclusive and required cases, some researchers also prefer to use mixed method approach. By the virtue of this method, a researcher combines both qualitative and quantitative research approach for a single study (Brysman and Burgess, 1999).

Therefore, based on the arguments discussed in previous sections of this chapter the present study implemented survey method and quantitative approach for analysis. In the preliminary phase, the results helped identifying the potential customer typology based on risk perception and uses-and-gratifications. The typology further treated as moderator along with other namely, age, gender and experience. In addition, to study the behaviour usage of the traveller with the help of the proposed conceptual framework based on UTAUT. With the help of a self-administered questionnaire, the data have was collected from the Mobile-App users. Further, post refinement the questionnaire was used for the main study to explain the research findings.

4.2.6. Survey

Social science researches predominantly adopt survey methods and they were deductive in approach (Saunders *et al.,* 2012). In business and management research, survey methods were popular techniques have been extensively used (Hirschheim and Klein, 1992). In order to answer the questions in the form of what, who, how much, where and how much, it was observed that survey method strategy is frequently adopted (Choudrie and Dwivedi, 2005). While conducting descriptive and exploratory research, survey method was extremely effective at the same time economical in terms of cost, facilitate researcher to capture large amount of data from the target population (Creswell, 2003). Further, from the perspective of data analysis, the data obtained from this method is easy to compare, analyse and interpret quantitative output with the help of inferential and descriptive statistical findings in the study. Not only this, it also a researcher to administer the entire research process than other research strategies. Therefore, the assertion discussed justifies the choice of researcher behind the philosophical approach of research strategy adopted for the current study.

4.2.7. Time horizon

Selection of research strategy: It was essential to identify the timeline of the research study being a component of research design. It provided clarity to the researcher about the frame of time needed or required for a project. The taxonomy of time horizons for a research strategy can be of two types namely, cross-sectional and longitudinal (Saunders *et al.,* 2012). The cross-sectional studies were primarily associated with a definitive phenomenon at a single defined and particular timeline- it can be weeks or months- for both qualitative as well as quantitative data collection. Such research designs were easier to conduct and consumer's less amount of time to measure to solve the research problem. They were also known as **One-Time Study** (Sekaran, 2003; Malhotra, 2010).

On the other hand, longitudinal studies require follow-ups to observe the fixed sample from a population, for the desired findings over a period. Since the sample remains the same, these studies provided a series of outcomes and illustrations over a longer period, in order to portray the variations and transformations taking place. Longitudinal researches differ from cross-sectional researches in terms of utilization of resources and the time taken to complete the research. Given that, longitudinal researches were exhaustive in nature and more time and resource intensive (Brysman and Burgess, 1999;

Dabholkar *et al.*, 2000; Shepherd Sekaran, 2003), the strategy adopted for the current study was cross-sectional in nature. In order to accomplish the described research objectives i.e. to identify the behavioural usage of travellers using Mobile-App; analyse the moderating influence of demographics and identification of typologies, treated as moderators in the conceptual framework. These were analysed using multivariate techniques including cluster analysis, to identify the typology of Mobile-App users. As stated by Hair *et al.* (2010), in order to obtain a robust output for any multivariate analysis, especially structure equation modelling (SEM), a minimum sample size of 200 is required.

4.2.8. Methods applied in mobile commerce adoption literature

Zikmund *et al.* (2003) defined that while type of data captured in survey method varies substantially due to the objective of study. Questionnaire instrument or interviews enable researchers to capture the primary data from the sample. Primarily, objectives established in survey methods were used to identify various attributes and components of the research problem. Literature review conducted for the current study revealed that mobile commerce adoption studies have predominantly dependent on empirical methods. In addition to this, in the past decade, there has been growing attention of scholars and academicians towards mobile commerce phenomena such as mobile banking, mobile applications, and mobile data service and so on. Various frameworks were adopted in this area to predict the behaviour intention of the user. Consequently, survey method was considered as most suitable research method in order to examine the phenomena whilst capturing larger sample size. Numerous meta-analysis studies have been conducted in this domain (Ma and Liu, 2004; King and He, 2006; Schepers and Wetzels, 2007; Wu *et al.,* 2011; Zhang *et al.,* 2012; Wu *et al.,* 2012; Gerpott and Thomas, 2014). Thus, the discussed assertions rationalize that survey research method have been the predominant strategy in this domain which was evidently observable from the studies conducted in the past decade. Hence, the relevant literature indicated that employing survey method likely enables the researcher to achieve the objective of this study.

4.2.9. Research design adopted by present study

As assertions discussed in the previous section regarding selecting survey research as an appropriate method that was based on the parameters namely, time, cost and accurate

mediums to access the information about a target population. In order to achieve the research objectives, the study has adopted positivist research paradigm followed by deductive approach for the research strategy and quantitative data collection techniques and lastly followed by analysis process (Zikmund *et al.,* 2013). A detailed flow chart of the research process adopted for the current study given below in the Figure 4.1:

1. The conceptual framework and the identified research gaps for the current study were based on the literature review

2. The formulation of research hypotheses, later were based on the conceptual framework proposed in this study

3. In order to identify the typology of travellers and behavioural usage of Mobile-App, a preliminary study has been conducted with the help of survey method.

4. As asserted at the previous stage, the instrument for the main study was developed based on the extensive literature of the domain and the results obtained from the preliminary studies.

5. Lastly, collection of data for the main study was done based on survey and cross-sectional method.

The present study administered into two phases: (1) Preliminary Phase and (2) Main Study Phase, the followings are discussed in detail.

4.3. PRELIMINARY STUDY

The instrument used for the preliminary study was based on three theories namely, UTUAT by Venkatesh *et al.* (2003) to identify the behavioural usage of Mobile-App. In order to identify the customer typology based on risk perception dimensions introduced by Featherman and Pavlou (2003). Further, constructs for uses-and-gratifications were based on (Stafford and Stafford, 2004).

Khare and Khare (2011) reported that the hospitality and travel product consumption over internet are intangible in nature, therefore the risks involved are high, level of satisfaction is individualistic and usage may differ from age, gender and the experience of the user. As asserted, it was now clear that usage of Mobile-App in the stated context. It becomes essential to explore the influence of customer typology, gender, age and experience in order to identify the behavioural usage of these Mobile-App. The findings of respondents obtained were used to refine instrument for the main study.

4.3.1. Sample selection

In the quantitative studies, the primary challenge is to identify a sufficient sample size in order to represent the population, so that the conclusions obtained from them can serve a justification for the further inferences for the objective of the study (Blumberg *et al.,* 2008). As stated by Saunders *et al.* (2011) that before using the instrument in order to collect the data it is necessary to test the reliability and validity. The reason behind this step in the research process is to refine the instrument with regard to record the data free from encountered problems and errors. The minimum sample size for a preliminary study stated by Saunders *et al.,* (2011) may be "between 10 to 30 years" for a survey research. Due to lack of a clearly defined sampling frame, non-probabilistic sampling technique was used and this was followed by a purposive sampling and snowball sampling. According to Vogt (2005) snowball technique was used to find research subjects with the help of existing subject provides the name or lead for another, who in turn to provides the information of third subject and the cycle further goes on likewise. In other words, this technique worked like growing rolling snowball (Cohen and Arieli, 2011). The criteria was defined for sample unit where the Indian citizens 18 years and above of age and their Mobile-App usage of last six months were taken into consideration. For the present study, the sample was chosen by considering recommendation within the multivariate analysis and the prerequisites of data analysis techniques such as Structured Equation Modelling (SEM) using LISREL with the help of smartPLS and general approaches to analyse the model using SEM. The other criteria for selecting the sample size selected for the current study is the observations from the extant literature. For the preliminary study, 145 respondents were collected to identify the behavioural usage and to establish the customer typology of the Mobile-App users.

4.3.2. Data analysis process

As discussed in the previous sections also, it has been stated that the data analysis for the current study was classified into two phases. In the first phase data analysis, the results was carried out to provide a clear picture about the respondents and their responsive feedback towards the developed instrument. In order to obtain the results, IBM SPSS (Statistical Package for the Social Sciences) 21.0 version have been used. This statistical package for social sciences studies have been accredited by many academicians, scholars as well as the commercial practitioners (Tabachnick and Fidell, 2007; Hooper *et al.,* 2008; Cox *et al.,* 2009; Field, 2013). The tool allowed us to perform

necessary tasks required for the study such as coding of the data, editing, identifying missing values and outliers from the dataset, investigate the normality assumptions, multi-collinearity, factor analysis, and cluster analysis to establish typology. The brief discussion of these tests performed in this study are listed and explained in detail with their rationalization in chapter 5.

4.3.3. Results of preliminary study

A preliminary study was conducted on 145 respondents with the help of self-administered questionnaire method. The preliminary study was an attempt to validate the behavioural factors influencing technology adoption stated by Venkatesh *et al.* (2003) as unified theory of acceptance and use of technology. In addition to this, to identify the customer typology based on risk perceptions and uses-and-gratifications has also been explored with the help of preliminary study. Since, the literature on risk perceptions in the consumer behaviour have been validated extensively in the literature (Bauer, 1967; Cunningham, 1967). The current study borrowed the risk perception dimensions from an established theory by Featherman and Pavlou (2003). Lastly, to identify the uses-and-gratifications of Mobile-App by Indian travellers, the application of this theory originally developed in the domain of media (Katz *et al.*, 1974; Ruggiero, 2000). With the emergence of technological innovations, the use of this gradually gained attention of academicians and scholars in that past few years. Three constructs viz. content gratification, social gratification and promotional gratification have been borrowed post reviewing the relevant literature of uses-and-gratifications with regard to mobile applications (Stafford and Stafford, 2004). Therefore, studies in the context mobile commerce adoption were scarce. The dimensions for the current study was adopted from the gratification a traveller experience using Mobile-App.

The findings of preliminary study were consistent with the UTAUT by Venkatesh *et al.* (2003). Despite the consistent results, two constructs behaviour intention and behaviour usage obtained cross loadings. As stated in the previous chapter, very few studies had explored the behaviour usage in the domain of mobile applications specifically. It has also been verified by previous studies that usage behaviour is a significant determinant of behaviour intention (Dwivedi and Irani, 2009; Hsu and Lin, 2015; Pentina *et al.,* 2016).

Further, risk perception dimensions investigation obtained all the factors loadings within threshold except two items of *time risk* (TR2 and TR4) had cross loading issues. Lastly, the uses-and-gratifications factors could not be extracted factors as borrowed from the literature in the context of Mobile-App usage. The results of the factor analysis (EFA) were further treated by removing cross loadings. In order to identify the factors as mentioned in the conceptual framework did not obtained meaningful factors to be taken for the main study. Therefore, the literature was further investigated and later established four factors post preliminary study i.e. functional gratification, promotional gratifications, social gratification and entertainment gratification. These four constructs in the main study obtained factors loadings within threshold. Preliminary study provided significant contribution in developing and identifying the uses and gratification constructs, as the literature in the context of mobile application was not sufficient. Therefore, this study established an elementary structure to explore the significant factors influencing traveller's usage behaviour of Mobile-App. In addition to this, it has also provided further direction to pave the way to explore the operational constructs suitable for the current study context. These findings were incorporated in the instrument to improvise it for the main study.

The preliminary test of the questionnaire was self-administered and captured 145 responses distributed via email through Questionpro- a survey collection portal. Prior sending the emails, the respondents were identified and verified as *travelling app users*. Further, these respondents were not contacted for the main study to fill the survey, in order to avoid the known respondent bias behaviour influence (Haralambos and Holborn, 2000). To select the sample size, literature suggested that a sample size for preliminary study could be restricted anywhere between 10 to 30 individuals (Luck and Rubin, 1987; Isaac and Michael, 1995; Diamantopoulos and Siguaw, 2000). To capture the data within timeline, a reminder mail to the respondents have also been sent. A total of 168 responses were collected out of which 145 were retained post treating the data in terms of incomplete responses and large number of missing data. The response rate for the preliminary study was 86%. In addition, with the help of the survey collection portal (Questionpro), it has recorded the average time per respondent took to fill the questionnaire i.e. 12-15 minutes.

In the light of above assertion, the next stage in the preliminary study was to check the content validity and reliability of the instrument (i.e. Cronbach's α). Further, a principal component analysis (PCA) was run to ensure that the scales for the current study were

supported by the data. The justification about the literature and use of cut off values criteria have already been discussed in the sub-sections of main study results.

The reliability test was conducted using Cronbach's alpha using SPSS version 21. As recommended by Hair *et al.* (2010) any value above 0.6 can be considered as reliable for further survey. Similarly, Nunnally *et al.* (1978) recommended the threshold value of Cronbach's to be above 0.70. In the present study except for the four constructs i.e. TR *(time risk)*, PriR *(privacy risk)*, PsyR *(psychological risk)* and PG *(promotional gratification)* the reliability ranged from 0.6 to 0.83 (see table 4.1). The constructs that has produced lower reliability than the recommended ones (i.e. 0.39, 0.41, 0.54) were for two respectively. Nonetheless, post examining each item of these four constructs, it was observed that *(time risk)* TR2 and TR4 had cross loadings and *(psychological risk)* PsyR3 along with *(privacy risk)* PRIR3 made a new construct, which later was analysed and treated as it is for the main study.

Table 4.1 Measurement of sampling adequacy and total variance

Factor	No. of items	Cronbach's α	EFA No. of	KMO	Bartlett's Test	Variance Explained
Performance Expectancy (PE)	5	0.90	1	0.83	.000	72.5%
Effort Expectancy (EE)	4	0.88	1	0.83	.000	74.7%
Social Influence (SI)	4	0.73	1	0.70	.000	56.5%
Facilitating Conditions (FC)	5	0.90	1	0.87	.000	71.5%
Behaviour Intention (BI)	2	0.87	1	0.50	.000	89%
Behaviour Usage (BU)	2	0.72	1	0.50	.000	78%
Financial/Monetary Risk (FR)	4	0.72	1	0.71	.000	71.3%
Performance Risk (PR)	5	0.83	1	0.74	.000	61%
Time Risk (TR)	3	**0.41**	2	**0.41**	.000	64%
Psychological Risk (PSYR)	3	**0.54**	1	**0.49**	.000	66%
Privacy Risk (PriR)	3	**0.39**	1	**0.50**	.000	66%
Social Risk (SR)	4	0.81	1	0.74	.000	64%
Promotional Gratification (PG)	5	**0.54**	1	0.81	.000	55%
Content Gratification (CG)	11	0.76	3	0.76	.000	64%
Social Gratification (SG)	6	0.63	2	0.60	.000	58%

The critical issue was noticed that in the first round of principal component analysis, for uses-and-gratifications, it has extracted six constructs. Due to the insufficient literature in the domain of mobile commerce adoption, further the constructs were reviewed and an additional construct was later added in this theory i.e. ***entertainment gratification*** (EG) and ***content gratification*** (CG) was later changed as ***functional gratification*** (FG). The results of EFA revealed that, sample adequacy Kaiser-Mayer-Olkin (KMO) was within the threshold i.e. 0.6 for all the except *time risk* (TR), *psychological risk* (PsyR) and *privacy risk* (PriR) (Kaiser, 1974). In addition, the Bartlett's test of Sphericity for all the constructs indicated that the correlation among the items were higher than 0.3 (Hair *et al.,* 2006). However, UTAUT findings obtained consistent results, which was the main foundation in the proposed conceptual framework (See Table 4.1).

4.4. MAIN STUDY

This section is related to the main data analysis post obtaining results in the preliminary phase. In order to generalize the results of the population the main study was constructed to test the developed research hypotheses based on the research objectives proposed in this study. A self-administered structured questionnaire was used for the data collection, this method is considered as one of the most proficient method because by the virtue of preliminary study, the researcher understood what has to be done precisely, what was needed and how required variables needed to be measured (Codo *et al.,* 2008; Babbie, 2013).

Babbie (2013) recommended that a questionnaire facilitate a researcher to capture various behavioural and psychological patterns of consumer behaviour. Generally the quantification and analysis of consumer behaviour complicated, in order to identify what influences their behaviour towards a phenomena. It was also considered as most effective technique when there is a large sample size, this method proves to consumes less time and considered as cost effective than interview method (Sekaran, 2003). To justify the asserted discussion, this can be concluded with the help of earlier research conducted where mostly researchers have adopted survey (questionnaire) method in their studies. (e.g., Kim *et al.,* 2008; Okazaki and Hirose, 2009; Yang and Zhou, 2011; Venkatesh *et al.*, 2012; Pietro *et al.*, 2015; Shang and Wu, 2017) used the survey method only.

4.4.1. Target population

The selection of target population for any research study was an integral and essential part of research process (Baker, 1994). According to Best and Kahn (2006), a population is a group of people possess homogenous characteristics, which differentiates the group of individuals from others. Target population was essentially required mostly because of substantial size of a population and secondly due to its diversity in nature to bring out the findings for generalizations. Hence, a target population for a particular study comprises a specific group for whom the results can be generalized and applicable as well. In the present study, the target population would be the Indian travellers above 18 years of age. The respondents were the Mobile-App users (*citizens of India above 18 years of age*) who have used the travelling app in the past 6 months and at least once in the last year were considered for the current study.

A sampling unit is defined as a list of all the cases from the population are specifically identified (Bryman and Bell, 2007). It was also specified as document that can be useful for a researcher to identify and implement various procedures for a specific subset of the population for the study (Babbie, 2013; Zikmund *et al.,* 2013). The determined sampling frame was identified based on the usage of Mobile-App in the context of travel and hospitality purposes.

Malhotra and Das (2009), recommended two sampling techniques i.e. probabilistic and non-probabilistic. In the current study, non-probabilistic sampling method was adopted for the data collection. Non-probabilistic techniques includes quota sampling, convenience sampling, purposive sampling and snowball sampling (*chain sampling*) (Hair *et al.,* 2010). A non-probabilistic sampling method using purposive sampling and snowball sampling method was integrated in the current study. A purposive-snowball technique allows a researcher to use responses to meet the required information (*Mobile-App user*) with respect to the proposed objectives of the study. Hence, the prerequisites were carefully taken into consideration. The respondents were carefully approached and those individuals who have been using Mobile-App for the travel and hospitality purpose were considered.

The major penetration and consumption of Mobile-App from 2 Tier and 1 Tier cities of India such as **Delhi, Mumbai, Chennai, Bangalore, Hyderabad, Kolkata** (IBEF, 2018). Thus, these cities were our firstly targeted for the data collection followed by the 2 Tier identified as smart cities by Government of India (GoI). The reasonable

availability of wireless internet and mobile data services, it has enabled smartphone users to experience various services in real time such as navigations while travelling, social media platforms, booking air tickets, third party vendors enabling to connect traveller overseas and so on. The consumption pattern of Indian travellers has radically shifted from booking travelling packages on their desktops to self-monitored and customized travelling services on their smartphones (Louviers *et al.,* 2003; Tsiotsou and Ratten, 2010; Thakur and Srivastava, 2014). Mobile devices and smartphones becoming a key customer tool assisting them during their travel such as bookings reservations, mobile banking, navigations (*transportation and accommodation*) and so on.

4.4.2. Sample size

It is essential for a researcher to identify an exact number of sample size. Although, to identify it, it was a complex and tricky procedure. Zikmund *et al.* (2013) recommended that lower the estimated sample size there will be greater the chances of inaccurate improper results. On the contrary of the stated fact, larger the estimated sample size lower will be the margin of error (Bryman and Bell, 2007; Hair *et al.,* 2006; Zikmund *et al.,* 2013). Thus, it was a very crucial stage in the research process where the researcher has to make decision making between choosing a larger sample size or a smaller one so that the results can be generalized for the target population. Although, pointed out by Hair and Ortinau (2003), most of the sampling techniques adopted in the consumer research is under the circumstances where the researchers has no prior anticipation about the population. It was due to the fact that, business environment are complex and swiftly evolving, therefore in such condition it is challenging to ascertain the population characteristics. In order to obtain the reliable scale for the current study, a preliminary study was performed and a factor analysis was done, where the factor loadings and Cronbach's alpha above 0.70 were considered to finalize the final instrument items.

To determine the sample size and discuss 'rules of thumb', the method of analysis used for the current study was structural equation modelling (SEM). As recommended by Salant and Dillman (1994), sample size can be identified based on four factors: (1) tolerance of sampling error (2) size of population (3) variation of the population with respect to the components of interest and (4) representative subgroup from the sample to estimate the results. Based on discussed criteria's the Cohen's statistical power analysis was used in the current study to identify the sample size recommended (Hair

et al., 2010). In behavioural sciences, it was considered as one of the most popular method to determine sample size. If the sample size was smaller than the estimated size, there was a greater chance that failure of the approach selected, solutions obtained may be improper and the parameters may result in low accuracy (Hair *et al., 2010*). For the stated reasons, the current study determined the sample size based on the studies predominantly cited within multivariate analysis. Nevertheless, in case of the unknown population or sample size exceeds 50,000 the sample size have been derived from formula given for such cases. The probability cut-off for the significance level usually 0.05 or 5% used. The study adopted Cochran's formula to determine the sample size from unknown population. Nevertheless, the number of mobile internet users are nearly 500 million, but it does not represent the exact count of users and the user base is above 50,000. As a result, using Cochran's formula is rationale in the context of the current study.

Cochran's formula (population>50,000)

$$\text{Sample Size} = \frac{Z^2 \, X \, (p) \, X \, (1-p)}{e^2}$$

Where,

Z= it is the selected critical value (Z value) of desired confidence level, 1.96 for a 95 percent confidence level

P= it is the estimated proportion of the population

e= margin of error or desired level of precision, also known as confidence interval level i.e. 1.96 = 95% CI level

$$\text{Calculation of sample size} = = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$$

$$= \frac{3.8416 \times 0.5 \times 0.5}{0.0025} = 384.16$$

Considering stated discussion, the minimum sample size required for the current study based on the sample frame as per the mobile internet user base in India. Based on the above calculations a minimum 384 respondents are should be included to obtain accurate and meaningful results. The study is analysing the conceptual framework with the help of SEM. It comprises of statistical techniques such as confirmatory factor analysis (CFA), structural path analysis (t-statistics) and total variance extracted (R^2). Apparently, there were other recommendations also available to determine sample size if conducting SEM for the study. For example, Stevens (1996) suggested that when least

square multiple regression method is applied, 15 respondents per construct is sufficient. Similarly, it was recommended by Bentler and Chou (1987) that when data is normally distributed minimum 5 responses per item is adequate. Another recommendation given by Tabachnick and Fidell (2007) stated that a general rule of thumb .i.e. a sample size of 300 is decent for factor analysis, if the factor loading is >0.80 then a sample size of 150 is also sufficient. Hence, if following the recommended criteria by (Bentler and Chou, 1987) for the current study that proposed 16 constructs with 68 items in the framework, the minimum sample size required would be 340 i.e. 68x5=320. Based on the above discussions and sample size calculation with the help of recommended methods within multivariate analysis, it was rationalized that a minimum sample size required for the present study should not be less than 320. Whereas, in the current study a sample of 707 was collected which was above the minimum required sample size calculated for the analysis.

4.4.3. Instrument development

A sound response rate and a robust instrument are predominantly used to measure numerous theoretical constructs of consumer behaviour. A questionnaire was also called a schedule, an interview form, or a measuring instrument, (Malhotra and Dash, 2010). The development of a questionnaire primarily comprises the designing measures for the research instrument (Fowler, 1993). Similarly, Hair *et al.* (2010) also suggested that, in order to capture the primary data from selected respondents the organized framework in terms of questionnaire is required. The present study as well adopted a structured questionnaire that was developed based on the results, refined post preliminary study and the existing literature of mobile commerce adoption. Indeed, several studies conducted in this domain to understand the behavioural usage of smartphone user, where survey method was extensively implemented. For instance Kim *et al.* (2008), Khare and Khare (2010), Choudhary and Gangotia (2012), Lai (2013), Morosan (2014), Chung *et al.* (2015), Aluri *et al* (2016). The statements included in the instrument were based on five point Likert type scale. The survey instrument scale established by Venkatesh *et al.* (2003) was used in the current study to understand influence of behaviour intention on usage. To measure the risk perception dimensions given by Feathermen and Pavlou (2003) was adopted for this study. To measure the uses and gratification, the constructs used in the study are adopted from (Stafford and Gillenson, 2004; Meiling Luo and Remus, 2014; San-Martin *et al.,* 2014). The

constructs to identify the uses and gratification of Mobile-App user were content, process and social gratifications.

The questionnaire used for the current study was based on content, type and scale. According to content, the classification of questions can be distributed in to sections namely, factual and subjective. Questions based on factual content are subject to capture the respondent's demographic characteristics. On the other hand, the subjective questions proposed in the questionnaire were used to capture the respondent's attitudes, frequency of using Mobile-App (in the current study context), behaviour or their intentions. As recommended by Dillman (2000), questions can be classified into four major types' i.e. open-ended questions, close-ended with ordered choice, close-ended with unordered choice and partially close-ended questions. Predominantly the use of open-ended questions were in qualitative research, also it allows the researcher to share in-depth insights due to the non-restrictions to any particular set of response. On contrary to this, the close-ended questions were popularly used in quantitative researches, where the choices given to participants or respondents are subject to specific set of response. Further, the third classification allows respondents to choose unordered categories independently by their own evaluation to opt the best among available choices given to them. Lastly, the partially close-ended questions provide a respondent flexibility and liberty to create their own responses.

Based on the discussion, subsequently the questionnaire comprises another important element i.e. scales required to measure the variable. The questions were classified based on the scale of measurement. The scales are of different types such categorical scales, dichotomous scales, multiple choice scales, ranking scales, Likert type scales and questions based on semantic differential scales. The categorical scales enables a respondent to choose an option out of given categories provided to them. Dichotomous scales allows a respondent to choose out of only two options such as YES or NO, TRUE or FALSE. Multiple-choice questions provides a respondent an option where he/she can opt out an option out of many options. Lastly, a ranking scale allows respondent to rank options or the exhaustive list of options. Such scales were significant to capture the data and analyse their relative implications of the variables. To conclude the last categories of scaling techniques were associated to measure primarily behavioural and attitudinal aspect of respondents with the help of Likert and Semantic Differential. For the present study, the used scales were categorical, dichotomous and five point rating Likert type scales.

4.4.4. Questionnaire content and layout

The instrument used for the current study was in the form of booklet and designed only in one language i.e. English. The instrument used for the main study comprises close-ended questions. In order to brief the respondent about the research objective, a background section comprises of relevant information associated with research study was given along with a cover letter that exclusively specifies the assurance of keeping the respondent information confidential (Smith and Dainty, 1991). The instrument comprises of four sections (Annexure I).

Section 1: In this, the instrument captures the respondent's background information as well their information of using various mobile applications including Mobile-App. First four questions in this section captured the respondent gender, age, occupation and types of mobile device they were at present using. The rest four questions were associated to explore the type of application they are using in general, followed by the frequency of Mobile-App and which travelling app they mostly prefer to use it for the purpose. Lastly, the question was proposed to ask their involvement with vendor while utilizing these services through Mobile-App.

Section 2: In this section, the questions pertaining to behavioural usage of Mobile-App users were focused in the study. This section measures the four key factors, which determines the *behavioural intention* (BI) and *usage behaviour* (BU) of an individual. These key factors *performance expectancy* (PE), *effort expectancy* (EE), *social influence* (SI) and *facilitating conditions* (FC) were based on the work by (Venkatesh *et al.*, 2003). The scale used for the questionnaire was five point Likert type statements given from 1 (*strongly disagree*) to 5 (*strongly agree*) followed by one question that captured the experience of using these app in terms of time frame mentioned in categorical format. The third section of the instrument was used to capture the risk perceptions of the respondents in terms of Mobile-App users. The dimensions were extracted from the work of Featherman and Pavlou (2003), in which he recommended seven dimensions of risks a consumer experience. *Monetary risk* (MR), *performance risk* (PR), *time risk* (TR), *psychological risk* (PSYR), *privacy risk* (PRIR), *social risk* (SR) and *overall risk* (overall risk), out of which overall risk have been removed due to poor factor loadings in the preliminary study, thus only six dimensions were retained for the main data collection. The behaviour of the respondents were captured on the scale of five-point Likert type statements given from 1 (strongly disagree) to 5 (strongly agree). The last segment of the instrument i.e. section 4 explores the uses-and-

gratifications behaviour of Mobile-App users. The constructs were explored with the help of preliminary study namely, *promotional gratification* (PG), *functional gratification* (FG), *social gratification* (SG) and *entertainment gratification* (EG) respectively. The statements for these constructs were extracted from the extant literature of uses and gratification. The scale to measure these variable for this section was also a five-point Likert type statements given from 1 (*strongly disagree*) to 5 (*strongly agree*).

4.4.5. Data collection procedure

As significant as other research steps in the process are, so does the data collection assists to identify the findings for the research questions to obtain the findings (Saunders *et al.,* 2000). As suggested by Dillman (2000) a well-designed and structured instrument supplements the suitable collection of analysis techniques that is also important for good response rate. Various methods of data collection have been adopted and available such as interview method, case study method and survey method, which also known as questionnaire method.

A questionnaire method generally includes a self-administration by the researcher (Saunders *et al.,* 2000). By the virtue of internet availability, these questionnaires are now administered electronically (google forms, surveymonkey) and postal or mail surveys. In order to collect the data, these questionnaire can be categorized into two types, first over the telephone collected by the researcher and collected in person by him/her by physically meeting the respondents and capturing the data under his/her administration (Saunders *et al.,* 2000). Therefore, in the case of present study, the questionnaire survey method was adopted to collect the data to carry out the result for the research objectives. The approach has been self-administered along with the email survey method for the present study. The primary preference was given to self-administration approach due to the non-response and missing value issues occurred in the preliminary study, therefore researcher collected the data visiting the respondent's in-person to make sure the questionnaires were not incomplete and filled with utmost attention. While adopting this method, the limitations of this method were time consuming and low response captured in a day. Whereas, on contrary of this method while circulating the questionnaire via emails and social media platforms the prime challenges were consistent follow up, incomplete responses and less interest to fill the

questionnaire by respondents. Annexure II demonstrates the descriptions of the number of responses and the response rate obtained across the different cities of India.

4.4.6. Testing of instrument

As discussed in the previous section, a preliminary study has been conducted as initial draft for the instrument. The instrument was later sent to the domain experts of information system/information technology. It has assisted the researcher to refine the instrument for the preliminary study post suggestions received from the domain experts. Further, the recommendations were incorporated and the questionnaire was then circulated to collect the data for preliminary study. The preliminary stage helps the researchers to identify the any existing loopholes and limitations in the instrument. It also provides clarity and directions to the researcher regarding content validity and reliability of the instrument (Sekaran, 2000). As recommended by Cooper and Schindler (2014) for preliminary study, the suitable sample size should not be less than 25 subjects; he indicated the size between 25 to 100 subjects is adequate to carry out inferences for the main study. In the current study, a total of 145 respondents in preliminary phase have been approached from the data have been collected. The responses were collected mostly from electronic means with the help of emails, social media platforms (Facebook, LinkedIn). After a week, a follow up reminder was sent to the respondents, a total of 168 responses received. Post this stage, collected data was analysed by implementing basic statistics to identify extracted factors with the help of principal component analysis using SPSS 21.0. Validity of an instrument is essential to reflect the actual findings of the investigation (Collis and Hussey, 2009). It examines whether the research question proposed for the study were well responded to carry of analysis (Saunders *et al.,* 2011). Lastly, the reliability was also analysed to verify the research findings so that they can be implemented later with a different sample of subjects (Ticehurst and Veal, 2000). In the current study, Cronbach's alpha coefficient has been used to examine the reliability of the instrument (Cronbach, 1951). Table 4.1 demonstrates the Cronbach's alpha coefficient for data set treated in this study. As recommended the Cronbach's alpha threshold value should be greater than 0.7 (Churchill, 1979; Nunnally and Bernstein, 1994). In the current study, the value of Cronbach's alpha for all the constructs measured on scales discussed above were greater than the recommended threshold i.e. 0.7. The reliability results obtained were ranged from 0.7 to 0.88. Each item have been examined out of which construct TR *(time risk),*

SR *(social risk)*, PR *(privacy risk)* and BU *(behaviour usage)* produced lower reliability than the recommended threshold value. Post examining each item from respective constructs it was discovered that few items produced lower inter-item loadings. The naming of them items for their respective constructs is given below (Annexure-IV).

TR1 (time risk) ***"I take time to learn how to operate Mobile-App"*** produced lower inter-item correlation (0.23). PR1 *(performance risk)* ***"I worry whether Mobile-App will really perform as it is supposed to"*** produced lower inter-item correlation (0.28) furthermore, PR5 *(performance risk)* ***"I worry (Wi-Fi, mobile data packs) Mobile-App does not perform well because of slow internet connection"*** produced lower inter-item correlation (0.28). BU1 *(behaviour usage)* ***"I use Mobile-App to search information"*** produced lower inter-item correlation (0.20) similarly, BU2 *(behaviour usage)* ***"I use Mobile-App to make payments"*** produced lower inter-item correlation (0.22) than recommended value 0.30 (DeVellis, 2003). Thus, these examined items were deleted and the value of Cronbach's alpha of *(time risk)* TR, *(performance risk)* PR and *(behavioural usage)* BU increased to 0.79, 0.88 and 0.80 respectively were within the threshold range.

4.4.7. Methods of data analysis

The next stage in the research process, post data collection was to analyse it with the help various analytical methods and tools. The statistical softwares used for the current study were SPSS version 21.0 and SmartPLS version 3.2.8. To examine the normality assumptions, current study have applied univariate and multivariate analyses. The analytical techniques adopted in the study are given below:

The preliminary phase was the first part of the data analysis of this study that demonstrate the descriptive statistics. The findings of preliminary phase contribute the comprehensive information of the respondents. In order to accomplish the results tentative analytical techniques have been implemented in the study are coding of the data, examining missing values, assumptions of normality, multi-collinearity, outliers and principal component analysis (PCA) (*Exploratory Factor Analysis*). The univariate normality test analysed the variables item by item. With the help of this test, central tendency or measures of location can be identified. A sample adequacy result also obtained i.e. Kaiser-Mayer-Olkin (KMO) statistics that demonstrates whether the sample size falls into adequate threshold or not. The minimum recommended value for

KMO should be above 0.60 (Kaiser, 1974). A Bartlett's test of Sphericity was also carried out to explain the correlation between the items, which should be above 0.3 to conduct exploratory factor analysis (EFA) (Hair *et al.,* 2010). Meeting all these requirements ensures that a questionnaire is highly reliable as a measurement tool.

Mainly three measures were widely used, mean, median and mode, where, mean explains the average score identified dividing the total number of scores, median explains the mid-point or the middle value post the data was ranked in aggregate order and lastly Mode helps to explain the value of most frequent value in the data set. Further, measures of dispersion demonstrate the range in terms of mean deviation and standard deviation or variance. Then, mean deviation also obtained to demonstrate difference between the mean and an observed item, later variance has also been exhibited to demonstrate the squared deviations from the mean to show the data points are scattered around the mean. It helps researcher to understand the fluctuations of variance. In addition, to understand the nature of distribution Skewness and Kurtosis was also examined. It is helpful to assess the characteristics of a distribution that exhibits the summary of the mean. The curve that demonstrates the flat-peakedness is defined as kurtosis; its normal distribution is equals to zero. It was essential to examine these measures of shape, as these statistical procedure if not taken into consideration carefully it can influence the desired results of the study. To extract factors Principal component analysis (PCA) was conducted. The number of factors extracted using KMO, Varimax Rotation, and compressed on the threshold value greater than 0.4. However, the factor scores were computed using regression method (Churchill, 1979).

4.5. CONCLUSION

The chapter sum up the adopted research design and methodologies in the current study. It justifies the reasoning behind the research approaches, philosophies discussed, research strategies implemented for the study. In the context of the study, the chapter also rationalized the positivist approach adopted in association with a critical overview of other approaches. From the perspective of methodology, it has also justified the quantitative method adopted whilst choosing survey method for data collection. A detailed description of sampling in terms of its frame, unit and size was also explained in detail used in the study.

While the research design selected for the current study was quantitative, the data captured for the preliminary study and main study was survey method. To analyse the data, a series of described statistical techniques were also discussed in this chapter along with their justifications. Further, the findings of the preliminary as well as the main study was discussed in the subsequent chapter 5.

CHAPTER 5
DATA ANALYSIS

5.1. INTRODUCTION

This chapter demonstrates the results obtained from the main study. It also exhibits the assessment and testing of the proposed conceptual framework using Structural Equation Modelling. The data analysis was conducted in to the following two stages viz.

1. Stage I: This involves the confirmatory factor analysis (CFA)
2. Stage II: This assesses the conceptual framework testing its validity and model fitness. Further, based on the results, the chapter discusses the hypotheses testing proposed in this study.

5.2. MAIN STUDY RESULTS

5.2.1. Missing data and treatment

A remarkable number of studies in social sciences domain and especially in marketing discipline have been based on survey method (Sekaran, 2000). In survey methods, it is very difficult and challenging to obtain the data completely when the collection is self-administered especially (Zikmund *et al.,* 2013). Missing data treatment is crucial in data analysis process (Tabachnick and Fidell, 2007). Encounter of missing data (missing value or incomplete response) in survey method creates problem when a respondent either leave, forgets or fail to respond to the question(s) in the questionnaire, thus it becomes difficult in the further data analysis to obtain meaningful for necessary decision making. Similarly, Hair *et al.* (2006) also recommended that missing values are also a critical issue while doing multivariate analysis. In order to treat the observed missing values there are recommended. The observed missing values can be treated later by either excluding or substituting could lead to erroneous results. Therefore, a process has been suggested by Hair *et al.* (2006) to be followed:

1. To examine the type of missing data in the dataset
2. To examine on which extent the values are missing in the dataset
3. To examine the randomness of missing values in the dataset and finally,
4. To treat and apply the remedies such as imputing method.

In addition to the process to treat the missing values, they are also classified into two categories- "ignorable" and "not-ignorable". In the present study, all questions were made compulsory to respond before submitting the questionnaire online, therefore, there were no chances of un-answered or missing values in the dataset. Similarly, while collecting the data in person, the researcher has made sure to recheck the questionnaire before collecting it from the respondent in order to avoid the missing value occurrence in the dataset. In such cases, the chances of not-ignorable missing value are possible. Therefore, to treat them Hair *et al.* (2006) and Tabachnick and Fidell (2007) recommended three patterns to identify and treat them further namely, missing completely at random (MCAR), missing at random or ignorable (MAR) and missing not at random or not-ignorable (MNAR). While treating MNAR it could leads to biased results, on the other hand, MCR is treatable with any tool and the results can be generalized. Lastly, not-ignorable missing values in a dataset occurs due to the respondent failure to mark all entries, rejection to respond to a particular item in the survey, which could be a possibility in survey method. In this study, to identify the patterns and extent or the frequencies of missing values within each item and variable the researcher used SPSS version 21.0 missing value analysis (MVA) procedure. The obtained results post this test revealed no missing values in the dataset (Appendix III and IV).

5.2.2. Assumptions of multivariate analysis

The present study used multivariate analysis techniques such as multiple regression, logistic regression, EFA and confirmatory factor analysis using SEM. Examining the data for compliance with statistical assumptions is a very important aspect for the robustness of results (Hair *et al.*, 2010). In Multivariate analysis, testing of the assumptions is necessary for two reasons, namely, complexity of the variables and complexity of analysis and results (Hair *et al.*, 2010). Thus, it is imperative to understand the assumptions of multivariate techniques. In the following section, we discuss the assumptions of multivariate technique.

5.2.3. Normality

After analysing the missing values in the dataset, the next step in analysing the data is to examine the normality, especially while conducting multivariate analysis (Tabachnick and Fidell, 2007). Normality describes the "shape of the data point's

distribution for an item as well as for a variable" (Hair *et al.*, 2010). In order to use F and t-statistics, normality test is an essential assumption of multivariate analysis; therefore, if deviations are large the complete statistical results are not fit to be generalized. Based on sample size and shape of the distribution are two significant assumptions to assess the severity in case the data is non-normal (Hair *et al.,* 2010). To identify shapes of normal distribution of univariate and multivariate variables graphical method or statistical methods are helpful (Tabachnick and Fidell, 2007). If the variable satisfies the multivariate normality criteria it likewise comply with univariate Normality, therefore multivariate assumption guarantees univariate normality and not visa-versa (Hair *et al.,* 2010).

5.2.4. Statistical and graphical method

In order to check normality by statistical method, Kolmogorov-Smirnov and Shapiro-Wilk (K-S) statistics was used for each variable in the current study (Shapiro and Wilk, 1965). This test is non-significant in case the p-value is >0.05 that explains the level of statistical significance of the normal distribution in the dataset. As asserted it can be inferred whether the data is normally distributed or not. Table 5.1 demonstrates the results of S-W and K-S test of normal distribution.

Table 5.1 Statistical test for normality - Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
PE	.076	707	.000	.966	707	.000
EE	.057	707	.000	.974	707	.000
SI	.086	707	.000	.902	707	.000
FC	.064	707	.000	.974	707	.000
BI	.043	707	.004	.990	707	.000
BU	.041	707	.008	.991	707	.000
FR	.127	707	.000	.954	707	.000
PR	.063	707	.000	.988	707	.000
TR	.050	707	.000	.993	707	.003
PSY	.062	707	.000	.987	707	.000
PRI	.064	707	.000	.986	707	.000
SR	.053	707	.000	.994	707	.005
PG	.073	707	.000	.983	707	.000
FG	.081	707	.000	.970	707	.000
SG	.093	707	.000	.945	707	.000
EG	.118	707	.000	.928	707	.000

The findings are statistically significant at 5% significance level. This indicates that data is not normally distributed. However, in case of large sample size the Kolmogorov-Smirnov test is sensitive and yields significant results easily even with small deviations (Field, 2006).

Table 5.2 Normality - Skewness and Kurtosis

	N	Mean	Std. Dev.	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	SE	Statistic	SE
PE	707	.00	1.00	1.000	-.619	.092	1.981	.184
EE	707	.00	1.00	1.000	-.587	.092	1.936	.184
SI	707	.00	1.00	1.000	-1.672	.092	8.222	.184
FC	707	.00	1.00	1.000	-.633	.092	.768	.184
BI	707	.00	1.00	1.000	-.288	.092	-.254	.184
BU	707	.00	1.00	1.000	-.069	.092	.245	.184
FR	707	.00	1.00	1.000	-.462	.092	-.552	.184
PR	707	.00	1.00	1.000	.278	.092	-.356	.184
TR	707	.00	1.00	1.000	-.016	.092	-.541	.184
PSY	707	.00	1.00	1.000	.187	.092	-.566	.184
PRI	707	.00	1.00	1.000	.418	.092	.097	.184
SR	707	.00	1.00	1.000	.077	.092	-.343	.184
PG	707	.00	1.00	1.000	-.154	.092	.218	.184
FG	707	.00	1.00	1.000	-.653	.092	1.370	.184
SG	707	.00	1.00	1.000	-1.004	.092	2.313	.184
EG	707	.00	1.00	1.000	-1.146	.092	2.171	.184

In order to assess the shape of the data distribution, skewness and kurtosis can also be identified. The equilibrium of distribution is denoted by skewness and the flatness/peakedness of the data distribution (Hair *et al.,* 2010). The distribution of skewness if shifted to the left side, it demonstrates a positively skewed data, whereas if the distribution is shifted on the right side, it demonstrates a negatively distributed data points. Whereas, the positive kurtosis denotes the tailed, shoulder or peaked distribution, on the other hand the negative kurtosis values represents a flatter distribution. Thus, values above 0 or below illustrate the deviations from the normal distribution curve. As recommended by Holmes-Smith *et al.* (2006) the acceptable range of skewness and kurtosis should be <±1 respectively. Similarly, Hair *et al.*, 2010 suggested the acceptable range of Skewness and Kurtosis to be <±2.58, whereas, in case of the current study all variables were within recommended range (Table 5.2) except SI of which it can be considered as moderately non-normally distributed. In addition, according to Mardia (1970) skewness and kurtosis expected value of kurtosis is given by *p(p+2)* for multivariate normal distribution of *p* variables. Therefore, the kurtosis

value obtained in the particular study is well within the threshold and such Kurtotic higher values are known as ***leptokurtism*** (Cain *et al.,* 2016). Lastly, suggested by Pallant (2007) that a skewness and kurtosis value found to be negative or positive does not imply any issue if they are within the acceptable range, also the large sample size reduces the issues of non-normality, which in the current study case is 707, that can be avoided in this case.

In the study, graphical method was used to check the normality for univariate and multivariate variables with the help of histograms. This helps to inspect the histograms visually, which should be in bell-shaped, curve having the frequency on higher side in the middle peak of the curve (Hair *et al.,* 2010). In order to assess the normality a reliable approach is to generate Q-Q and P-P plots. These graphs demonstrate the observed values and estimated values in the form of straight line. The distribution of the data points on the straight line have to be close and around the line in the graph (Hair *et al.,* 2010). The Q-Q and P-P plots were generated in the current study are shown in Annexure III. All the multivariate variables were clustered around the straight line and no further changes required in the variables.

5.2.5. Multicollinearity

The mutlicollinearity is an issue related to the correlation matrix that exhibits the high correlation of predicting variables with each other. To further test this, variance inflation factors (VIFs) were computed and they were found to be around 2 and less than the conservative threshold of 5 (Pallant, 2007). As stated by Menard (1995) and Myers (1997) VIF greater than 10 and lower than 0.1 indicate the presence of multi-collinearity. Thus, suggesting that multi-collinearity was not a major issue in the current study. All the values in the study found to be within threshold of less than 10. In the existence of multi-collinearity, it restricts the amount of regression value and creates complication to understand the contribution of each predicting variable. Therefore, it is highly recommended to investigate the extremely correlated variables and exclude one of them (Tabachnick and Fidell, 2007). In order to identify the multicollinearity among the independent variables, current study used the bivariate correlation matrix by using Pearson Correlation. Table 5.3 exhibits that none of the independent variables is highly correlated (>0.8).

Table 5.3 Pearson Correlation for observing multicollinearity

	MR	PR	TR	PSYR	PRIR	SR	PG	FG	SG	EG	PE	EE	SI	FC	BI	BU
						Correlations										
MR	1															
PR	.000	1														
TR	.000	.000	1													
PSYR	.000	.000	.000	1												
PRIR	.000	.000	.000	.000	1											
SR	.000	.000	.000	.000	.000	1										
PG	-.185**	-.014	-.124**	-.067	-.264**	-.104**	1									
FG	.156**	-.028	.000	-.050	.016	-.188**	.000	1								
SG	.224**	.064	-.004	.023	-.021	.027	.000	.000	1							
EG	.044	.104**	.004	-.001	-.062	-.007	.000	.000	.000	1						
PE	-.030	-.007	-.057	-.026	-.147**	-.058	.244**	.049	-.020	.142**	1					
EE	-.027	-.005	-.036	-.006	-.103**	-.058	.179**	.058	.001	.190**	.000	1				
SI	.081*	.029	-.039	-.059	-.044	-.061	.203**	.134**	.060	.033	.000	.000	1			
FC	-.107**	.011	-.069	-.049	-.156**	-.105**	.254**	.207**	.035	.119**	.000	.000	.000	1		
BI	.298**	.009	.040	.009	.088*	-.107**	-.072	.239**	.191**	.009	.000	.000	.000	.000	1	
BU	.062	-.073	.009	-.013	-.012	.081*	-.097**	-.076*	.018	.023	.000	.000	.000	.000	.000	1
***. Correlation is significant at the 0.01 level (2-tailed).**																
. Correlation is significant at the 0.05 level (2-tailed).																

Table 5.4 Regression for observing VIF and tolerance effect

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.054	.037		.000	1.000		
	MR	.056	.041	.056	1.355	.176	.818	1.223
	PR	-.080	.038	-.080	-2.133	.033	.982	1.018
	TR	.002	.038	.002	.059	.953	.976	1.024
	PSYR	-.020	.038	-.020	-.538	.591	.989	1.012
	PRIR	-.024	.040	-.024	-.608	.543	.892	1.121
	SR	.063	.039	.063	1.625	.105	.940	1.064
	PG	-.124	.044	-.124	-2.825	.005	.721	1.388
	FG	-.098	.041	-.098	-2.398	.017	.829	1.206
	SG	.004	.039	.004	.099	.921	.914	1.095
	EG	.009	.039	.009	.232	.816	.896	1.116
	PE	.035	.040	.035	.877	.381	.884	1.132
	EE	.028	.039	.028	.721	.471	.903	1.108
	SI	.037	.039	.037	.950	.343	.906	1.103
	FC	.060	.041	.060	1.446	.149	.823	1.216
	BI	.007	.041	.007	.163	.871	.837	1.195

Coefficients[a]

a. Dependent Variable: BU

In order to compute the tolerance effect and VIF values a multiple regression method along with collinearity diagnostic option was implemented. Here, the results demonstrated in table 5.4 revealed that all independent variables were free from multicollinearity i.e. the VIF values were above 0.961. Although, there was no issue of multicollinearity within the variables, further the same was confirmed using factor analysis with principal component analysis.

5.2.6. Demographic details of the respondents

Data collection for the full scale was conducted during October 2017 to January 2018. The main study was carried out in the stage two, wherein 790 responses were collected and 707 responses were retained post excluding missing values, outliers and incomplete responses. The data surveyed (online and offline/in-person) was collected from Indian cities such as Delhi, Bangalore, Mumbai, Chennai, Hyderabad, Agra, Jaipur, Surat and rest of the cities (Annexure II) with the help of snowball sampling technique. In the previous chapter 4, the details of sample selection were already been comprehensively discussed. Appendix I exhibits the description of

the survey questionnaire sent via emails and distributed in person to the respondents who uses Mobile-App.

Table 5.5 exhibits the demographic characteristics description of respondents. The sample comprises of 69% (n=489) male respondents and 30% (n=218) female respondents. The percentage of male travellers was found to be higher than female travellers while capturing data. In addition, it was also observed that most females prefer their travelling itineraries arranged by their male counterparts such as their family or in friend circle. Therefore, this rationalize the lower percentage of female traveller compared to male travellers in the dataset.

In Table 5.5 the age of the travellers was classified into five categories, namely, below 20 years, 20-30 years, 31-40 years, 41-50 years and 50 years above respectively. The results displays that that 70.9% travellers were between the age of 20-30 years (n=501), followed by 15.4% between the age group of 31-40 years (n=109), 7.4% travellers in the age category below 20 years (n=52) and 2% travellers in the age category of 50 above (n=14).

Table 5.5 Demographic profile

Profile	Group	Frequency	Percent
Gender	Male	489	69.2
	Female	218	30.8
	Total	**707**	**100**
Age	Below 20	52	7.4
	20-30	501	70.9
	31-40	109	15.4
	41-50	31	4.4
	50 above	14	2.0
	Total	**707**	**100**
Experience	6 months or less	123	17.4
	7-12 months	103	14.6
	13-18 months	97	13.7
	19-24 months	108	15.3
	25 months or more	276	39.0
	Total	**707**	**100**
Occupation	Student	265	37.5
	employed	353	49.9
	self-employed	59	8.3
	not working	30	4.2
	Total	**707**	**100**
Mobile Device Ownership	Smartphone	707	83.5
	Tablet	85	12.3
	Smartphone+Tablet	68	9.6
	Normal Featured Phone	31	4.3

	Smartphone+Tablet+Normal Featured Phone	14	1.9
	Total	**707**	**100**
Mobile-App do you have currently in your phone	Less than 5	60	8.5
	5-10 app	204	28.9
	11-20 app	193	27.3
	21-30 app	110	15.6
	more than 30 app	139	19.7
	Total	**707**	**100**

Further, the third demographic detail captured in the study was experience using Mobile-App. This construct was segregated into five categories for using Mobile-App namely, 6 months or less, 7-12 months, 13-18 months, 19-24 months and 25 months or more. The obtained findings revealed that 39% travellers (n=276) had experience of using the Mobile-App for 25 months or more, followed by 17% travellers (n=123) of 6 months or less, 15% travellers (n=103) of 19-24 months, 14.6% of 7-12 months and 13.7% travellers had experience of 13-18 months of using Mobile-App .

The category educational level revealed that most of the respondents were postgraduates (51.7%, n=290) and fewer had a doctorate degree (3.2%, n=16). Occupation of the respondents was described into five categories, namely, private sector employment, public sector employment, self-employment, retirement and others (Housewives, students, etc.). The majority of the respondents worked in the private sector (52.3%, n=262) and fewer had retired (4.4%, n=22).

Lastly, the occupation of these respondents was also captured. The occupation of the respondents revealed that most of the Mobile-App users were employed followed by students. The categories defined to capture the occupation were asked given into four categories namely, student, employed, self-employed and not working. The findings stated that 49.9% of the travellers (n=353) were employed comprises of managers and professionals from various industries followed by 37.5% students (n=265) comprises of graduates, post graduates and doctoral students, 8.3% self-employed (n=59) comprises of travellers who were the owner of micro or small enterprises and 4.2% travellers were found in the category of not working (n=30) respectively.

Table 5.6 Purpose of using mobile application

Purpose for using mobile application	Respondent	Percentage	Total
Texting	665	94.05	707
Searching information on internet	598	84.58	707
Sending/Receiving Mails	595	84.15	707
Travel (Flight/Train/Bus/Cab)	557	78.78	707
Sharing pictures/media files	549	77.65	707
Entertainment	546	77.22	707
Shopping	506	71.57	707
Food and Beverage	383	54.17	707
Hotel/Resorts/Guest House	335	47.38	707
Gaming	276	39.03	707

Table 5.6 presents the use of mobile applications for various purposes by the mobile users. It is clear from the table that the use of Mobile-App for the purpose of texting (94.05%) followed by searching information on internet (84.58%), sending/receiving mails (84.15%), for travel purposes such as flight/train/bus/cab travel (78%), sharing pictures (77%), entertainment (77%), shopping (71%), food and beverage (54%), hotel and accommodation (47%) and gaming (39%). Further, Table 5.7 explains the usage of travelling app by mobile users exclusively. The results revealed that google maps (71%) is the top most preferable application while travelling. From this onwards, Ola cabs (66%), Make My Trip (56%), Uber (56%), Indian Railway Catering and Tourism Corporation (IRCTC) (49%), GoIbibo (35%), Redbus (29%), Oyo Rooms (28%), Yatra (15%), Cleartrip (12%), Trip Advisor (11%), Expedia (11%) and Ixigo (9%). Based on the discussed results, it is clear that Mobile-App users prefer the Ola Cabs (66%) for their local transportation while travelling, while Uber (56%) as secondary preference. In order to book travel products/services they prefer Make My Trip (56%) than the existing competitors such as Yatra.com, Expedia and Ixigo. Among the budget hotel and accommodation Oyo rooms (28%) is also a preferred online company by the Mobile-App users for their economic and reasonable tariffs.

Table 5.7 Travelling app usage

Type of travel app	Respondent	Percentage	Total
Google Maps	504	71.71	707
Ola Cabs	473	66.90	707
Make My Trip	401	56.72	707
Uber	396	56.01	707
IRCTC	349	49.36	707
GoIbibo	251	35.50	707
Redbus	211	29.84	707
Oyo Rooms	202	28.57	707
Yatra	112	15.84	707
Cleartrip	87	12.31	707
Trip Advisor	83	11.74	707
Expedia	82	11.60	707
Ixigo	64	9.05	707

5.2.7. Exploratory Factor analysis (EFA)

The literature stated two techniques of factor analysis, namely, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Hair *et al.,* 2010). In order to identify the desired variable or anticipated variable based on literature review, these techniques were significantly of help to extract the factors from the rational subsets that are relatively independent of each other. Primary objective of EFA is to precisely investigate data and contribute the information regarding the most rational factors from the data (Hair *et al.,* 2010; Rummel, 1970). EFA's primarily proposed to the interrelationships among variables in order to identify new set of variables. It is a helpful technique for multivariate analysis in which it identifies the factor structures post observing some variables (Stewart, 1981). In other words, it is also known as data reduction technique that helps a researcher to establish the dimensions within the dataset (Gorsuch, 1983; Rummel, 1970). The main objective was to opt for CFA and to validate the extracted factors from EFA, whether they are consistent with the defined factor identified through EFA. The method to implement CFA can be achieved with the help of structure equation modelling (SEM). Further, exploratory factor analysis was applied to examine the measurement items of the questionnaire used in the present study. Preliminary study has provided directions towards risk perception and uses gratifications measurement items particularly.

5.2.8. EFA results of UTAUT

With the help of principal component analysis extraction (PCA) method, current study has applied EFA technique to examine the variables of the instrument related to the factors influencing behavioural usage in the proposed conceptual framework. Among various methods to extract factors such as principal component, maximum likelihood, image factoring, unweighted factoring, alpha factoring and generalized weighted least squares factoring, the literature information system has validated the most rational and robust method (Tabachnick and Fidell, 2007). The initial solutions for EFA obtained with the help of PCA considers the total variance, that later derives factors from it containing small proportion of unique as well as the error variances (Hair *et al.,* 2010). This particular technique of extracting factors yields maximum variance from the dataset in such a way where it produces the factors with highest and lowest variance (Tabachnick and Fidell, 2007). In addition, PCA also reduces a larger set of items measuring variables into a smaller number of variables by reorganizing similar variables into new uncorrelated linear composite variance. Moreover, the main advantage of PCA is that it can identify and reduce a large set of measurement items into a smaller number of components by converting correlated variables into new unrelated linear composite variables (Hair *et al.*, 2010). To extract the factors an Orthogonal Varimax Rotational method was employed as it extensively been used in the domain literature also the results are capable of generalization and replication power in comparison with oblique rotational method (Pallant, 2007). Orthogonal rotations have been considered as the best fitted with previous and future dataset, wherein results produced applying oblique are fitted only in current study context (Rennie, 1997). Results can be interpreted easily in case of orthogonal uncorrelated factors than the results from oblique rotation (Tabachnick and Fidell, 2007).

To assess the adequacy of the factors extracted, three criteria's were followed in the present study, namely, latent root criterion based on eigenvalues, percentage of the variance and the scree plots. The first common and most used criteria recommended by Hair *et al.* (2010) was eigenvalues to greater than one (>1) that if satisfy the latent root criteria and the solution which produces 60% of the total variance achieves the percentage of variance criterion. Secondly, the percentage of variance when taken into consideration, it is measured as total variance of the original variable shared with others; this consideration of total variance is known as communality (Hair *et al.,* 2010). In the absence of variance the variable communality becomes 1 and in case a variable that shares no communality with other variables become 0 (Field, 2006).

As recommended by Hair *et al.* (2010) the items that shows communality <0.5 (50%) accounted as weal items. Nevertheless, in exceptional cases due to sample size, the acceptable threshold value of communalities of 0.3 considered to be satisfactory (Pallant, 2007).

Besides the asserted criteria's to extract appropriate factors, Kaiser-Meyer-Olkin (KMO) test was also applied along with Bartlett's test of Sphericity, where the value of KMO is considered to be statistically significant >0.6 which indicates the interrelationship of the statistical significant items (Tabachnick and Fidell, 2007). On the other hand, the value of Bartlett's test of Sphericity >0.3, that depicts the correlation among the items, therefore it is a befitting assumption for EFA (Hair *et al.,* 2010).

For the current study, EFA was applied to 68 items borrowed from UTAUT theory related to behavio2ral usage. Table 5.8 exhibits the produced value of KMO i.e. 0.882 as well as the Bartlett's test was significant at $p<0.005$, that meet the recommended threshold initial assumptions of EFA (Kaiser, 1974; Bartlett, 1954). The EFA for UTAT components emerged consistent with the theory. The results produced six components with an eigenvalue >1 with the total variance of 64.9%. In the procedure of factor analysis, two items have been dropped due to cross-loading issues, therefore item BU1 and BU2 eventually deleted from the instrument. The deleted items were the statements of behaviour usage of Mobile-App, in which BU3 and BU4 found to be most relevant in the context of the Mobile-App usage. Therefore, in the second round of EFA grouped rest two items into a factor loading rest of the items in the dataset.

Table 5.8 Statistical tests for initial assumptions of EFA

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.882
Bartlett's Test of Sphericity	**Approx. Chi-Square**	6749.695
	df	253
	Sig.	0.000

Table 5.9 exhibits the values of the communalities elucidated by each item. The results reported all items shared >0.5 communalities with their components. Thus, based on the statistical significant results, all the items were used for further analysis.

Table 5.9 Communalities shared by individual items

	Initial	Extraction
Communalities		
PE1	1.000	.615
PE2	1.000	.698
PE3	1.000	.588
PE4	1.000	.585
EE1	1.000	.597
EE2	1.000	.615
EE3	1.000	.731
EE4	1.000	.716
SI1	1.000	.686
SI2	1.000	.672
SI3	1.000	.622
SI4	1.000	.504
FC1	1.000	.636
FC2	1.000	.627
FC3	1.000	.642
FC4	1.000	.636
FC5	1.000	.475
BI1	1.000	.556
BI2	1.000	.629
BI3	1.000	.673
BI4	1.000	.642
BU3	1.000	.894
BU4	1.000	.893
Extraction Method: Principal Component Analysis.		

Further, Table 5.10 demonstrates the results of eigenvalues and the total variance explained by each factor. The factors that has contributed an eigenvalue>1 were the only statistically significant and rest were excluded (Hair *et al.*, 2010; Tabachnick and Fidell, 2007). The results shows that only six components managed to have eigenvalues >1, where these components explained the total variance of 64.9% which is higher than the recommended value i.e. 60% (Refer Table 5.10 column cumulative %). Therefore, these six factors were retained and rest were not considered to be fit in the instrument. Lastly, the scree plot was also used to determine the number of components. This plot helps to identify the components with the help of graph. The graph demonstrate the latent roots against the count of components in their extraction order, therefore the cut-off point of the curve determines the number of components to retain (Hair *et al.,* 2010).

Table 5.10   Eigenvalues and variance extracted by each component for UTAUT

| Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.988	30.382	30.382	6.988	30.382	30.382	2.851	12.397	12.397
2	2.463	10.707	41.089	2.463	10.707	41.089	2.673	11.623	24.020
3	1.808	7.863	48.952	1.808	7.863	48.952	2.564	11.149	35.169
4	1.418	6.164	55.116	1.418	6.164	55.116	2.538	11.034	46.203
5	1.245	5.415	60.530	1.245	5.415	60.530	2.496	10.853	57.055
6	1.011	4.396	64.926	1.011	4.396	64.926	1.810	7.871	64.926
7	.804	3.497	68.423						
8	.724	3.146	71.569						
Extraction Method: Principal Component Analysis.									
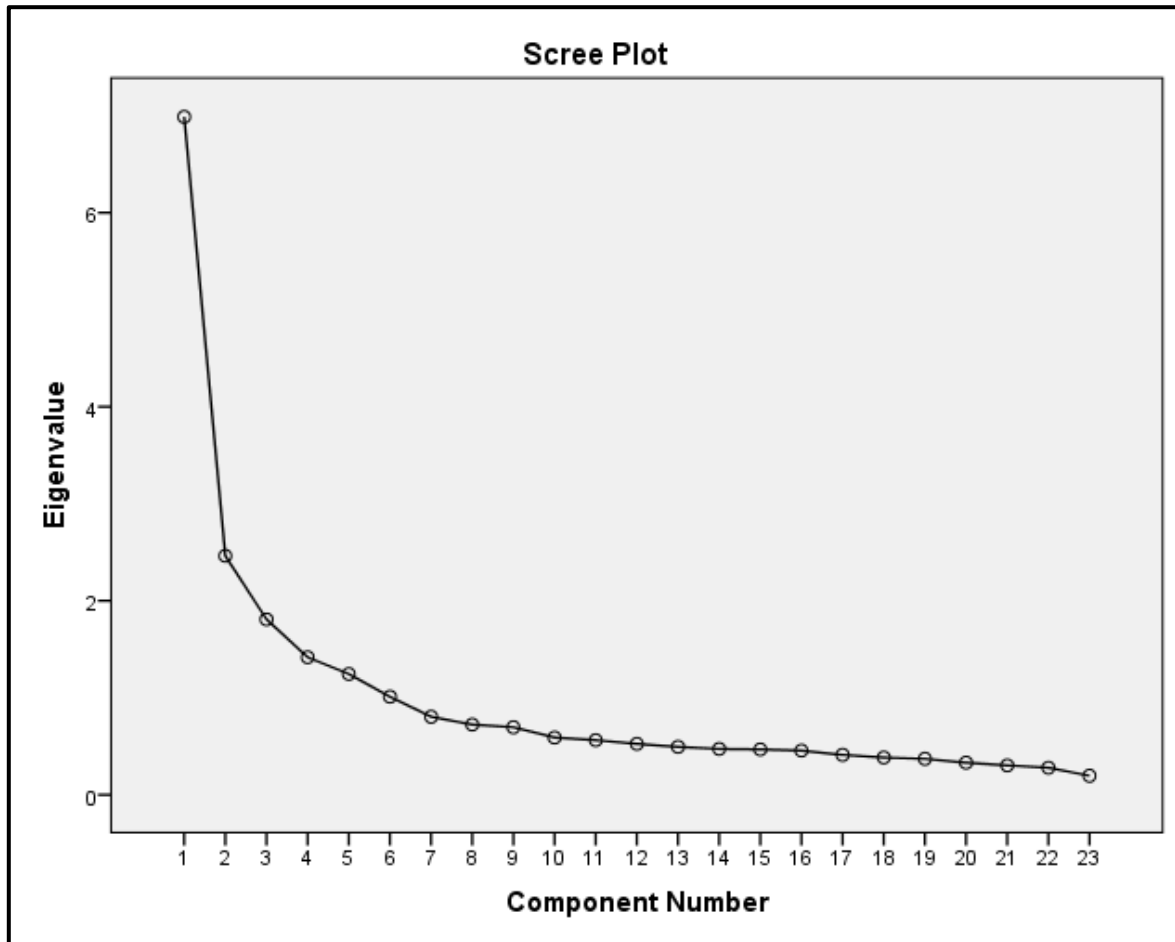
Figure 5. 1. Scree plot of UTAUT components

Table 5.11 exhibits the rotated pattern matrix with a six-factor solution, post EFA sample adequacy assumptions. It is recommended that the precise correlation between a component and its item (factor loading) should be >0.7 (Henseler *et al.*, 2009). In addition, as suggested by Churchill (1979) that the item below <0.4 factor loading can be deleted from the instrument. The results shows that the items were loaded on six factor solutions varied from 0.6 to 0.94 that meets the minimum requirement of the factor loading criteria (Hair *et al.*, 2010; Churchill, 1979; Pallant, 2007). Cronbach's α have been considered to measure the component with their relevant items to ensure their consistency in the instrument (Cronbach, 1951; Nunnally, 1978). Thus, the six components yielded from factor analysis is given below in the Table 5.11:

Table 5.11 Rotated component matrix from PCA

Items	Component					
	1	2	3	4	5	6
	EE	**FC**	**PE**	**BI**	**SI**	**BU**
EE3	.810					
EE4	.790					
EE1	.652					
EE2	.648					
FC4		.734				
FC3		.680				
FC1		.655				
FC5		.613				
FC2		.600				
PE2			.797			
PE4			.703			
PE1			.702			
PE3			.683			
BI3				.779		
BI4				.739		
BI2				.671		
BI1				.625		
SI1					.794	
SI3					.781	
SI2					.773	
SI4					.668	
BU3						.945
BU4						.942
Cronbach'sα	**0.77**	**0.79**	**0.81**	**0.84**	**0.70**	**0.80**
a. Rotation converged in 6 iterations.						

5.2.9. EFA results

- **Uses-and-gratifications**
- **Risk perceptions**

Post identifying the measurement items of behavioural usage, a 18 items of risk perceptions and 20 items of uses and gratification FR, PR, TR, PSYR, PRIR, SR, PG, FG, SG and EG were examined using EFA. Table 5.12 and 5.14 exhibits the KMO test of sample adequacy at 0.892 and 0.912 that is above the recommended value >0.6 and Bartlett's test was also significant ($p < 0.005$), both the results satisfies the initial criteria's for the EFA (Kaiser, 1974; Bartlett, 1954). Table 5.13 and 5.15 exhibits the values of the communalities elucidated by each item. The results reported all items shared >0.5 communalities with their components. Thus, based on the statistical significant results, all the items can be used for further analysis.

Table 5.12 Statistical tests for initial assumptions of EFA – Uses-and-Gratifications

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		. 912
Bartlett's Test of Sphericity	Approx. Chi-Square	15163.789
	df	903
	Sig.	0.000

Table 5.13 Communalities shared by individual items – Uses-and-Gratifications

Communalities		
	Initial	**Extraction**
PG1	1.000	.798
PG2	1.000	.838
PG3	1.000	.786
FG1	1.000	.535
FG2	1.000	.641
FG3	1.000	.691
FG4	1.000	.603
FG5	1.000	.555
FG6	1.000	.632
FG7	1.000	.605
SG1	1.000	.619
SG2	1.000	.695
SG3	1.000	.598
SG4	1.000	.630
SG5	1.000	.533
EG1	1.000	.682
EG2	1.000	.727
EG3	1.000	.737
EG4	1.000	.753
EG5	1.000	.596

This table shows the values of communalities explained by each item. PG = promotional gratification, FG = functional gratification, SG = social gratification, and EG = entertainment gratification.

Table 5.14 Statistical tests for initial assumptions of EFA – Risk Perception

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		. 892
Bartlett's Test of Sphericity	Approx. Chi-Square	8077.375
	df	210
	Sig.	0.000

Table 5.15 Communalities shared by individual items – (Risk Perceptions)

Communalities		
	Initial	**Extraction**
FR1	1.000	.726
FR2	1.000	.750
FR3	1.000	.687
PR2	1.000	.700
PR3	1.000	.770
PR4	1.000	.650
TR2	1.000	.616
TR3	1.000	.708
TR4	1.000	.617
PSYR1	1.000	.673
PSYR2	1.000	.778
PSYR3	1.000	.726
PRIR1	1.000	.797
PRIR2	1.000	.852
PRIR3	1.000	.811
SR2	1.000	.752
SR3	1.000	.697
SR4	1.000	.744

Table 5.16 Rotated component matrix from PCA (Uses and Gratification)

Items	Component			
	1	**2**	**3**	**4**
	FG	**EG**	**SG**	**PG**
FG3	.773			
FG6	.764			
FG2	.763			
FG7	.725			
FG1	.700			
FG4	.689			
FG5	.655			
EG4		.823		
EG2		.823		
EG3		.799		
EG1		.751		
EG5		.721		
SG2			.811	
SG4			.747	
SG1			.747	
SG3			.713	
SG5			.662	
PG2				.855
PG3				.833
PG1				.822
Cronbach'sα	**0.89**	**0.89**	**0.83**	**0.88**
Note: Rotation converged in six iterations from PCA				

Further, Table 5.16 and 5.17 exhibits the rotated component matrix with the six-factor solution for risk perceptions and four-factor solution for uses-and-gratifications, all items were adopted from Featherman and Pavlou (2003); Stafford and Stafford (2004); Kwon *et al.* (2014); Chua *et al.* (2014). The internal consistency of these factors was also statistically significant in terms reliability measure i.e. Cronbach's α values are given in Tables 5.16 and 5.17 respectively.

Table 5.17 Rotated component matrix from PCA (Risk Perception)

	Component					
	1	**2**	**3**	**4**	**5**	**6**
	PRIR	**SR**	**FR**	**PR**	**PSYR**	**TR**
PRIR2	.921					
PRIR3	.899					
PRIR1	.890					
SR4		.842				
SR2		.842				
SR3		.772				
FR1			.817			
FR2			.794			
FR3			.770			
PR3				.820		
PR2				.793		
PR4				.735		
PSYR2					.816	
PSYR1					.792	
PSYR3					.770	
TR3						.811
TR4						.734
TR2						.682
Cronbach'sα	**0.889**	**0.804**	**0.80**	**0.78**	**0.799**	**0.715**
Note: Rotation converged in six iterations from PCA						

Table 5.18 and 5.19 exhibits the results of eigenvalues and the total variance explained by each factor. The factors that has contributed an eigenvalue>1 were the only statistically significant and rest were excluded (Hair *et al.*, 2010; Tabachnick and Fidell, 2007). The results shows that six components of risk perceptions and four components of uses-and-gratifications managed to have eigenvalues >1, where these components explained the total variance of 66.2% and 72.5% that is higher than the recommended value i.e. 60% (Refer Table 5.18 and 5.19 column cumulative %). Therefore, these ten factors were retained and rest were not considered to be fit in the instrument. Lastly, the scree plot was also used to determine the number of components. This plot helps to identify the components with the help of graph. The graph demonstrate the

latent roots against the count of components in their extraction order, therefore the cut-off point of the curve determines the number of components to retain (Hair *et al.,* 2010). The shape in the scree plot tends to decrease from the very first component having the highest eigenvalue in the graph likely to decrease until it reaches its minimum eigenvalue (Tabachnick and Fidell, 2007). It can be clearly identifiable in the graph where the change in shape shows the difference between the components of significance having eigenvalue greater than 1 and the factor having less than 1 were discarded (Hair *et al.,* 2010; Pallant, 2007). In the current study, the scree plot shows a confirms similar number of components extracted with the help of Kaiser's latent root criterion, i.e. >1. The graph 5.2 and 5.3 clearly demonstrates the interruption between 6-7 for risk perception and 4-5 for uses-and-gratifications.

Table 5.18 Eigenvalues and variance extracted by each component for uses and gratification

Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.852	39.261	39.261	7.852	39.261	39.261	4.189	20.943	20.943
2	2.116	10.578	49.839	2.116	10.578	49.839	3.485	17.426	38.369
3	1.798	8.992	58.832	1.798	8.992	58.832	3.171	15.855	54.224
4	1.487	7.437	66.268	1.487	7.437	66.268	2.409	12.044	66.268
5	.801	4.005	70.274						
Extraction Method: Principal Component Analysis.									

Table 5.19 Eigenvalues and variance extracted by each component for risk perception

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.239	29.106	29.106	5.239	29.106	29.106	2.464	13.686	13.686
2	2.484	13.802	42.908	2.484	13.802	42.908	2.205	12.251	25.937
3	1.870	10.388	53.296	1.870	10.388	53.296	2.157	11.981	37.918
4	1.419	7.882	61.178	1.419	7.882	61.178	2.140	11.888	49.806
5	1.040	5.780	66.958	1.040	5.780	66.958	2.132	11.843	61.649
6	1.001	5.561	72.519	1.001	5.561	72.519	1.957	10.870	72.519
7	.604	3.356	75.875						
Extraction Method: Principal Component Analysis.									
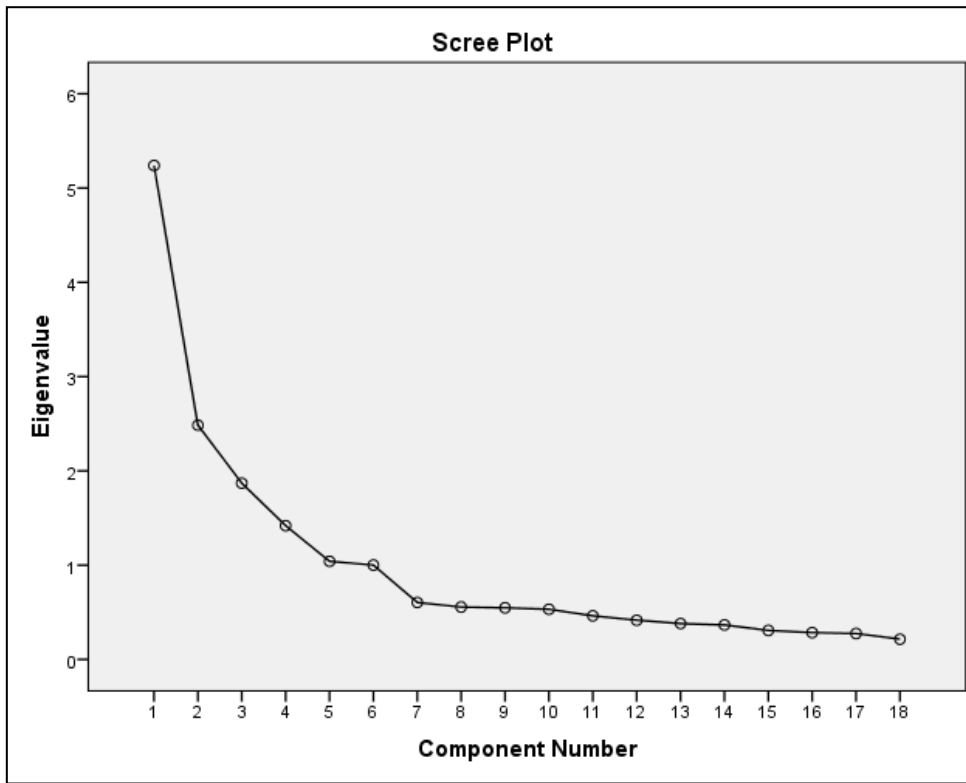
Figure 5.2 Scree plot of risk perception components
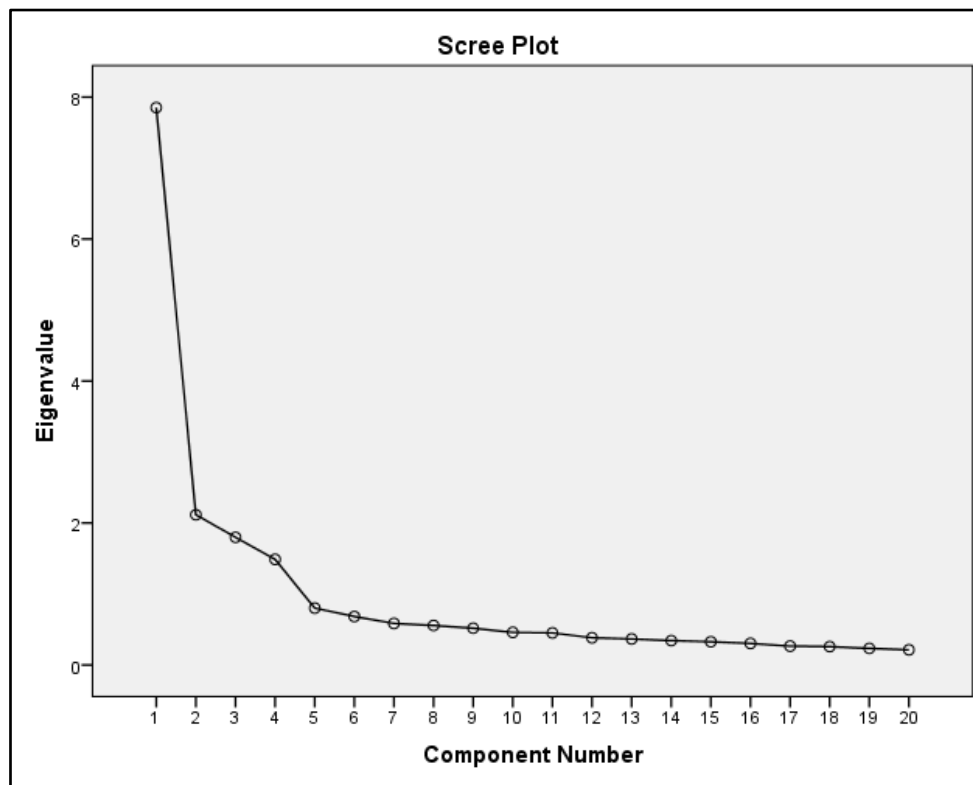
Figure 5.3 Scree plot of Uses-and-Gratification components

5.2.10. Customer typology based risk perception and uses-and-gratifications

To identify the typology of the travellers based on risk perception and uses and gratification as discussed in the previous chapter, cluster analysis was conducted. In order to understand the homogeneity among traveller groups based on their RP and U&G. Based on the regression method factor scores obtained from factor analysis, hierarchal and k-means cluster analysis method was applied. No standardization was required further due to the five-point Likert scales of the items in the instrument. The hierarchal clustering was conducted applying Ward's linkage to explore the number of clusters based on the factor scores of the ten constructs. In order to identify the dissimilarity measurements Squared Euclidean Distance was employed. In order to implement hierarchical clustering the desirable sample size should be less than 300 data points, thus not recommended when the sample size is large. On the other hand, Ward's method provides a good criterion to identify optimum number of clusters. Although, the major drawback of hierarchical clustering is that the allocation of the cases are final in the result and they cannot be segregated other than combining with other clusters. Thus, a non-hierarchal clustering technique has been applied to improvise the results obtained by Ward's method. K-means method centroids with the Ward's method was applied mentioning clusters from 2 to 7 were further tested. In the procedure, a four-cluster solution was taken into account as one among the distinctive and meaningful clusters. (Refer Table 5.20)

Table 5.20 Customer typology

Factor	Worried Travellers	Savvy Travellers	Anxious Travellers	Deal Seekers	F	Sig
Promotion Gratification	-.22560	.64546	-.70548	.68453	153.641	.000
Functional Gratification	.37552	.54665	.03645	-1.15126	131.092	.000
Social Gratification	-1.13141	.41207	.24217	-.04848	92.585	.000
Entertainment Gratification	-.19417	-.06924	.18321	-.09189	5.235	.001
Financial Risk	-.77419	-.13752	.41405	.05971	48.362	.000
Performance Risk	-.50951	.15872	.42772	-.60585	54.897	.000
Time Risk	.22274	-.30393	.20140	-.16944	13.268	.000
Psychological Risk	.10675	-.27053	.05856	.16447	6.702	.000
Privacy Risk	.49119	-.56151	.30879	-.25939	48.996	.000
Social Risk	-.05899	-.55427	.18510	.45306	36.372	.000
Respondents (n)	119	187	265	136		

A four-cluster solution has been identified with the help of hierarchal cluster and K-means method namely, *Worried traveller* (high perception of privacy risk and functional gratification and low perception of social risk and financial risk), *Savvy traveller* (high perception of promotional gratification and privacy risk and low perception of privacy risk and social risk), *Anxious traveller* (high perception on financial risk and performance risk and low perception on promotion gratification), the *deal seekers* (high perception on promotional gratification and social risk and low perception on financial risk and performance risk). The final cluster centers and their respective proportion of each center is given in Table 5.20.

Cluster-1 Worried traveller

This cluster includes high perception of privacy risk and functional gratifications, whereas low perception of social risk and financial risk. These traveller's perceives to use such app for accurate information anywhere and anytime. Likewise, they perceives Mobile-App helping them to view the pictures of the places shared by other travellers. Worried travellers are also concerns about the reviews provided on such app, seeks suggestions by the app in terms of nearby destination to visit and provide them a navigation to reach. At the same time, they are also highly concerned about their payments conducted through electronic gateways *(credit cards, wallets, debit cards).* On the other hand, they have low perception in social risks where they are least bothered about what others think of them to use or not use Mobile-App. Lastly, these travellers are also low on financial risk where they are not concerned to pay through digital gateways provided they secured (See Annexure VII).

Cluster -2   Savvy travellers

This cluster comprises of strong functionality requirement to use the Mobile-App such as social gratifications, promotional benefits, open to share locations, reviews, experiences and pictures on social media (Facebook, Instagram or Twitter). As they are, the travellers in their early 20's they are not much concerned about risks involved related to privacy or security. Their primary interest is ease of use towards a Mobile-App and active interest for large audience for increased acceptability as influencers on social media platforms. They are the young and well connected with technology "wannabes" or the Millennials of the generation (See Annexure VII)

Cluster-3 Anxious travellers

This cluster includes the functionality of Mobile-App that should cover security and financial risks of a traveller. They may or may not be open to share their travel related information, reviews or experiences. These travellers consider promotional deals or benefits as add-ons to their preference list, but will not actively searching for them. They can be called as Gen-Y or older population (See Annexure VII).

Cluster-4 Deal seeker travellers

This cluster takes into account the financial or other benefits as their primary preference. Moreover, basic security features and functional ease for hassle free experience is all they look forward. Their focus is not a particular Mobile-App, rather the Mobile-App that provides them attractive discounts coupons, promotional offers, cash-back and so on. Just like Savvy travellers, they are also not keen into sharing their travel information on social media or provide content on travelling websites in terms of sharing reviews of their travelling experience. Thus, these travellers attraction to install such app is for cheaper cost of travel (*Misers*) by taking benefit of offers, attractive deals and then later may be uninstall them (See Annexure VII).

5.3. Structure equation modelling (SEM)

Many theories and concepts have been tested and verified by academicians and researchers with the help of Structure Equation Modelling (SEM). In addition, it has become a quasi-standard for researches in management studies and social sciences now (Hair *et al.,* 2012; Henseler *et al.,* 2012). SEM is a powerful technique as it includes regression-based approaches such as multiple regression, variance analysis and logistic regression to be applied in confirmatory factor analysis. Although, this can also be used for EFA with its factor results, it was observed that it will be better for the analysis to be along with the cluster analysis and multidimensional scales. SEM can be carried out using two methods: covariance based techniques (CB-SEM) and variance based partial least square (PLS-SEM). Henseler *et al.* (2012) stated that CB-SEM have been extensively employed in the previous research whereas, PLS-SEM was lately explored in the area of marketing research. In order to optimise the explained variance of endogenous latent variables, the approach of PLS-SEM is appropriate over CB-SEM (Henseler *et al.,* 2012). The implementation of PLS-SEM allows a researcher to explore the relationship between the latent variables as well as their indicators. In the absence of adequate literature and theoretical

information and complex relationships between latent variables and their indicators, the approach of PLS-SEM is more prudent (Henseler *et al.,* 2012; Gefen, 2000). Whereas, it was observed that the approach of CB-SEM is more prudent in case of an extensive research accomplished in a particular domain also to compare the established results.

5.4. Measurement model assessment

A varied number of statistical procedures for this purpose are available and most of them are based on software applications. For the current study investigation, the researcher has chosen partial least square analysis (PLS). The conceptual framework for the current study was tested using partial least squares (PLS). Smart PLS 3.2.8 (Ringle *et al.,* 2015) was used to analyse the measurement and structural model in this current study. In order to evaluate the validity and reliability of the conceptual framework the following analysis was carried out internal consistency, indicator reliability, convergent validity and discriminant validity. SmartPLS is statistical software to examine the psychometric properties of the conceptual framework. In the following subsections results of the measurement model exhibited. All the constructs are modeled as reflective.

5.4.1. Assessment of reflective measurement model

The assessment of the reflective measurement model includes composite reliability test, outer loadings for individual reliability of each indicator, to assess the convergent validity-average variance (AVE) and lastly to measure the discriminant validity-Fornell-Larcker criterion and cross loadings.

5.4.2. Composite reliability

The composite reliabilities are shown in Table 5.21 presents the internal consistency of the constructs. As it can be seen with the results below all of the components meets the satisfactory criteria i.e. above 0.6. The results obtained in the table are ranges from 0.81 to 0.91. To ensure the internal consistency reliability of a measurement model composite reliability (CR) was tested. Any value below 0.6 considered to be a lack of reliability in the instrument (Henseler *et al.,* 2009). The conceptual framework for the current study was tested using partial least squares (PLS). Smart PLS 3.2.8 (Ringle *et al.,* 2015) was used to analyse the measurement and structural model in this current study. In order to evaluate the validity and reliability of the conceptual

framework the following analysis were carried out- internal consistency, indicator reliability, convergent validity and discriminant validity. SmartPLS is statistical software to examine the psychometric properties of the conceptual framework. In the following subsections results of the measurement model is exhibited. The results demonstrates that each construct in the current study exceeds the recommended threshold i.e. 0.7.

Table 5.21 Composite reliability of reflective constructs

Constructs	Composite Reliability
BI	0.81
BU	0.91
EE	0.89
FC	0.87
PE	0.86
SI	0.84
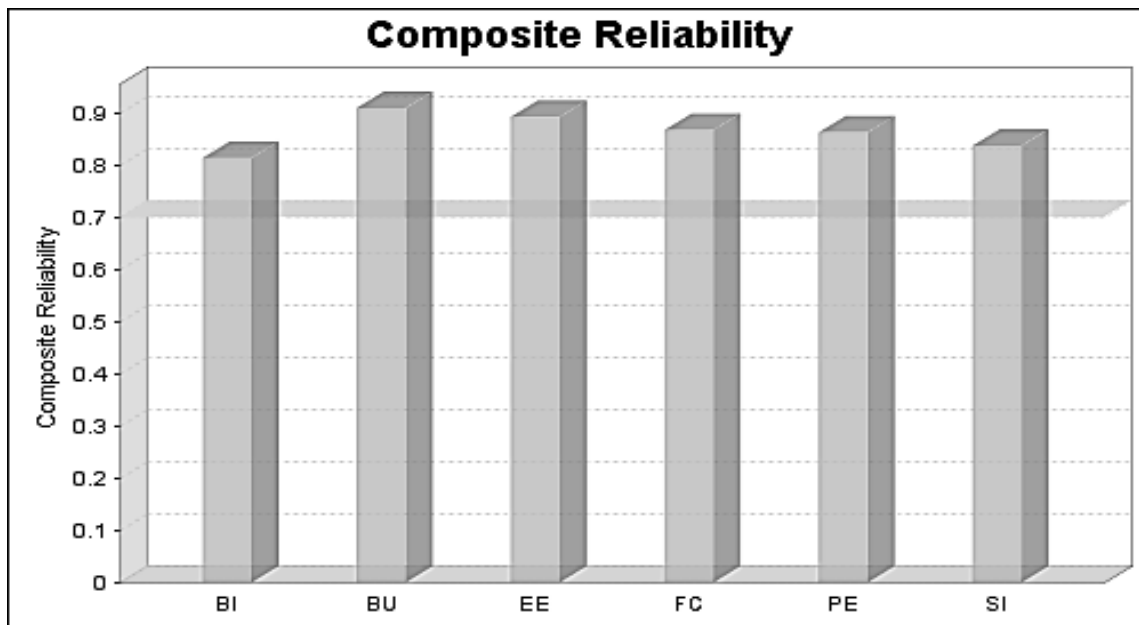
Figure 5.4 Chart of CR of reflective constructs

5.4.3. PLS outer model loading

To make the multivariate analysis measurement consistent in this study, confirmatory factor analysis (CFA) for all constructs was performed using Smart PLS software (Ringle *et al.,* 2015). CFA generally can be performed on pre-validated scales derived from the exploratory factor analysis (EFA) discussed in the above sections. With the help of CFA, the reliability of all the constructs were examined with the help of convergent and discriminant validity. Smart PLS is

user friendly and easy to perform various tests associated with CFA. PLS analysis was run on the latent variables without the second order constructs. As suggested by Agarwal and Karahanna (2000) using this method is helpful in order to test proposed theory or concepts. The conceptual framework with all latent variables (shaded circles) and their respective measuring items are represented by rectangles shown in the Figure 5.3. The conceptual framework for the current study was tested using partial least squares (PLS). Smart PLS 3.2.8 (Ringle *et al.,* 2015) was used to analyse the measurement and structural model in this current study. In order to evaluate the validity and reliability of the conceptual framework the following analysis have been carried out- internal consistency, indicator reliability, convergent validity and discriminant validity. In the following subsections results of the measurement model exhibited. The results demonstrates that each construct in the current study exceeds the recommended threshold i.e. 0.7. Table 5.21 exhibits the composite reliabilities (CR) values for each construct range from 0.81 to 0.91 respectively, therefore these findings indicates that the items used in the instrument for each construct possess internal consistency reliability.
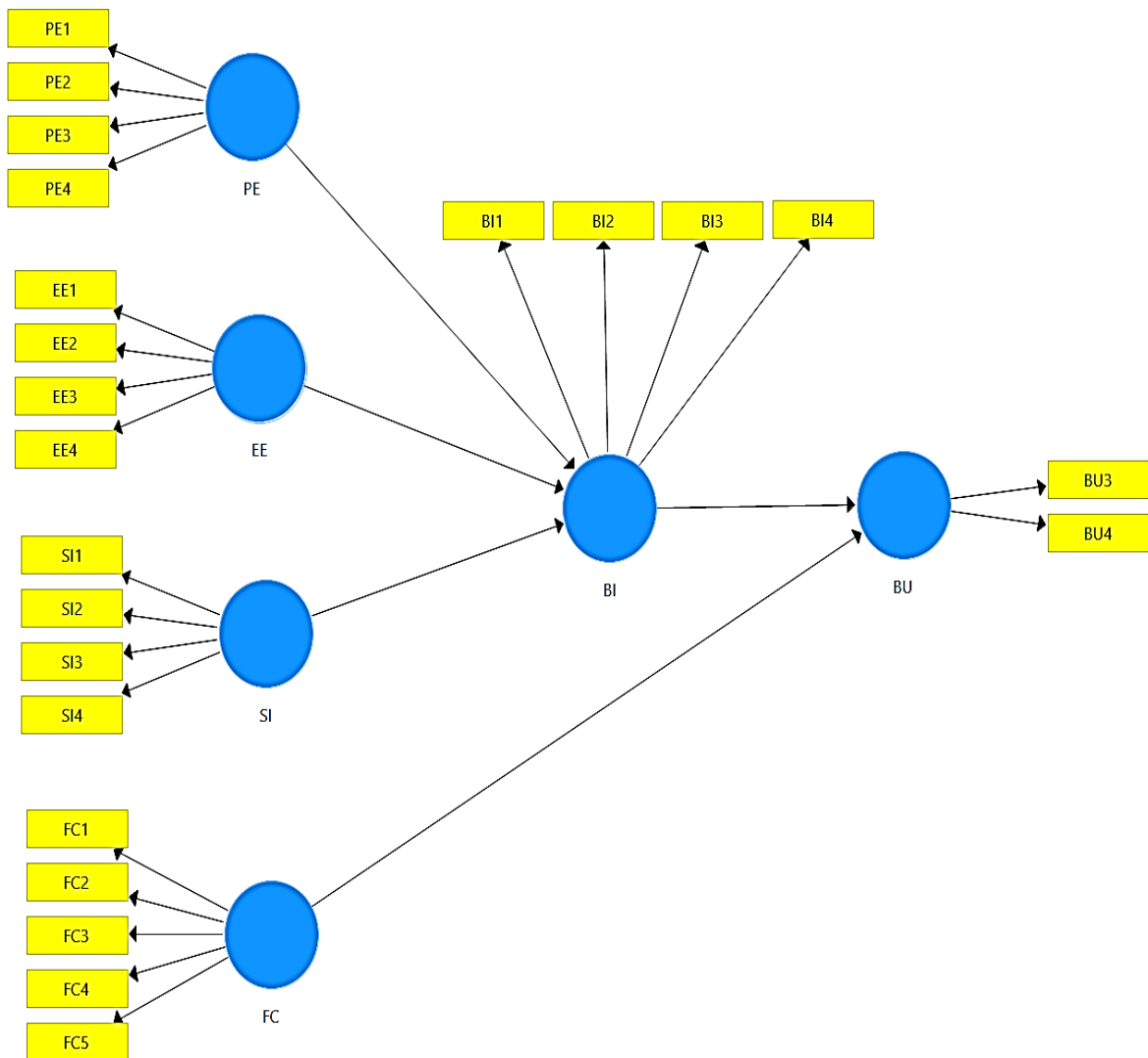
Figure 5.5 Conceptual framework tested in SmartPLS

Table 5.22 Outer loadings of indicators

	BI	BU	EE	FC	PE	SI
BI1	0.78					
BI2	0.48					
BI3	0.80					
BI4	0.81					
BU3		0.92				
BU4		0.90				
EE1			0.81			
EE2			0.81			
EE3			0.82			
EE4			0.84			
FC1				0.81		
FC2				0.76		
FC3				0.77		
FC4				0.79		
FC5				0.62		
PE1					0.81	
PE2					0.78	
PE3					0.78	
PE4					0.76	
SI1						0.86
SI2						0.91
SI3						0.66
SI4						0.53

5.4.4. Convergent validity

The proposed conceptual framework the assumption validity also can be tested with the help of convergent validity (Henseler *et al.,* 1999). This test examines the factors that are explained by their corresponding indicators. This can be assessed with the help of average variance extracted (AVE) scores (Fornell and Larcker 1981). AVE satisfactory cut off value should be above 0.5, which indicates strong convergent validity of the indicators having more than 50% of explanatory power of the stipulated constructs (Chin and Newsted, 1999). As exhibited in table 5.22 all constructs are within the satisfactory range of internal consistency to demonstrate the convergent validity. In addition, composite reliability (CR) should always be higher than the value of average variance extraction (AVE).

Table 5.23 Average variance extracted values of reflective constructs

Indicators	Average Variance Extracted (AVE)
BI	0.53
BU	0.83
EE	0.67
FC	0.57
PE	0.61
SI	0.57

5.4.5. Discriminant validity

Like other validity investigation, discriminant validity is another assumption to verify the respective indicators load strongly on their corresponding construct than the other. It is the degree to which the factor is distinguished from other factors and exhibit unique factors of their own (Hair *et al.,* 2014). There are two methods for measuring discriminant validity, whereby one examines the cross loadings and the other compares the square root for the constructs AVE. The first one bases on that the outer loading for an indicator should be higher than the loading to all of the other constructs. The Fornell-Larcker criteria states that's the square root of AVE is suppose to be higher than the maximum correlation with any other factor (Hair *et al.*, 2014). The second method, the Fornell-Larcker criterion, is based on that the square root of the AVE should be higher than the highest correlation with any of the other constructs (Hair *et al.* 2014).

Table 5.24 Correlations and measures of validity among variables

	BI	BU	EE	FC	PE	SI
BI	0.73					
BU	0.44	0.91				
EE	0.49	0.25	0.82			
FC	0.56	0.34	0.61	0.75		
PE	0.45	0.28	0.54	0.46	0.78	
SI	0.18	0.20	0.16	0.13	0.26	0.76

5.4.6. Path coefficients

As stated by Hair *et al.* (2010) the structural model captures the linear regression effects of the internal factors (endogenous constructs) upon one another. It demonstrates the pattern of the relationships constructs share with each other. The structural model was examined with the help of three major criteria viz. path coefficients, path significance using p-value and variance explained (R^2). In the current study, the validation for the same was done with the help of SmartPLS 3.2.8. As per the guideline suggested by Ringle *et al.* (2015), the model was designed

accordingly. The results of bootstrapping yielded the statistical findings of each path coefficient. Using a bootstrapping method with 500 re-samples using randomly selected sub-samples yielded the results to estimate the hypothesized relationships shown in Figure 5.5 (Chin, 1998). As a criteria recommended by Rossiter (2002), asserted that for the structural model all the paths should be resulting in a t-statistic value <2 and the latent variable R^2 should be greater than 50%. The t-values are the estimates produced with the help of bootstrapping, the statistical results for all the paths obtained in the current study are significant EE➔BI, PE➔BI, FC➔BU, BI➔BU except one relationship i.e. SI➔BI. The path coefficients shown in Table 5.25 for the reference.

Table 5.25 Relevance and significance of path coefficient

Construct Relationships	Path coefficients t Statistics	p Values
BI➔BU	8.65	0.00
EE➔BI	7.71	0.00
FC➔BU	3.21	0.00
PE➔BI	4.95	0.00
SI➔BI	1.71	**0.09**

5.4.7. Model fit

In order to examine the research model, in the PLS path modelling use of variance explained (R^2) have been employed. In the recent years, added the goodness of fit have been added in the assumption to predict as a measure of assessment for research model (Tenenhaus *et al.,* 2005). The results indicated that the model explains the variance of predictors to BI (29%) whereas, BI➔BU (20%). Further, the latent variables explained by the research model were significant except one i.e. SI➔BI. The effect size of the research model have been examined in the study with the help of f-square (f^2). Cohen's effect size values of 0.02, 0.15, and 0.35 suggest small, medium, and large effects, respectively (Cohen, 1988, Henseler *et al.*, 2009). In addition, Chin (1998b), suggested that the values of f^2 when 0.02, 0.15, and 0.35 for the significant independent variables exhibits weak, moderate and substantial effects. It measures measure the strength of each predictor variable in explaining endogenous variables. Where in the current study the effect size obtained for EE➔BI at 0.12 and BI➔BU at 0.11 is medium followed by a weak effect size of the relationships are SI➔BI and FC➔BU at 0.00 and 0.02 respectively.
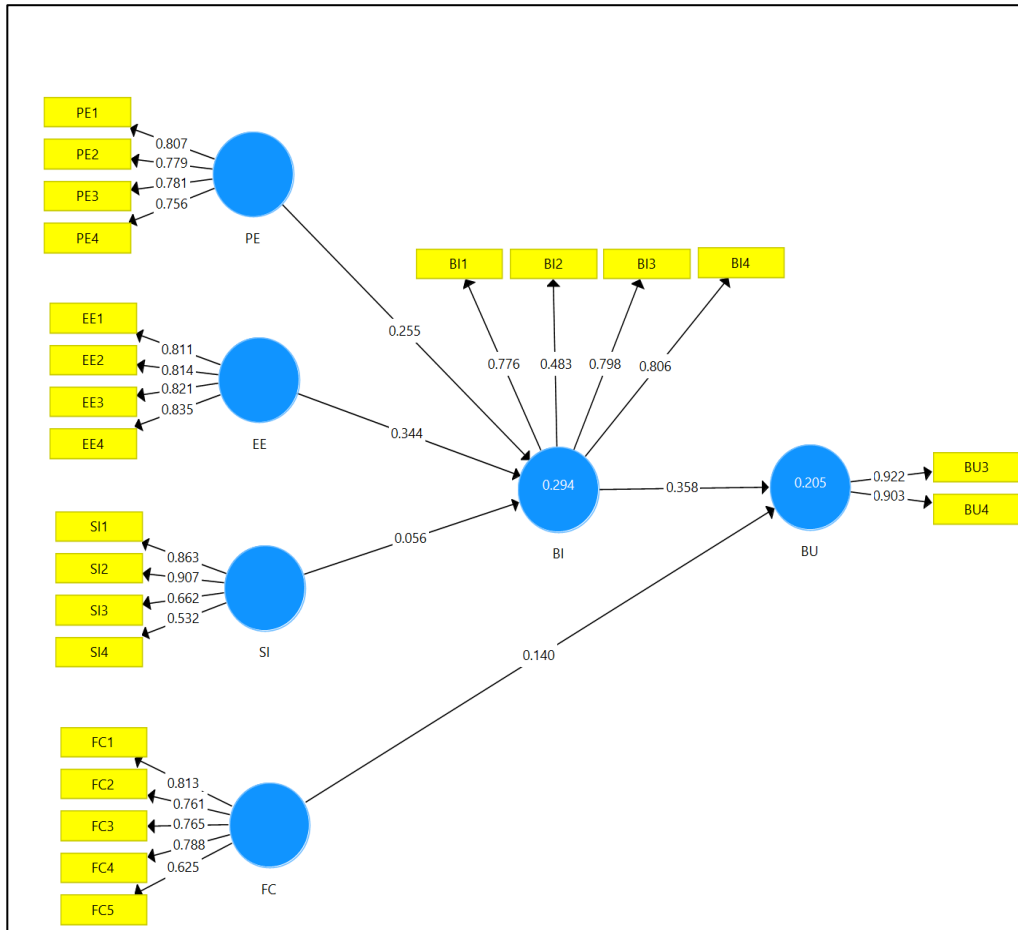
Figure 5.6 Measurement model used for CFA

5.4.8 Influence of moderating variables – Multigroup analysis (MGA)

After analysing the direct relationships of the conceptual framework, the next step was to analyse the relationships of the four moderators discussed in chapter 3 i.e. age, gender, experience and typology. Analysing the moderators allows a researcher to identify the influence of a third variable on the relationship between an independent and dependent variable and these moderators can be qualitative or quantitative as variable (Baron and Kenny, 1986). In the current study, multigroup analysis (MGA) have been integrated to identify the influence of the proposed moderators in the conceptual framework. According to Henseler and Fassott (2010), MGA is widely recommended as it allows a researcher to examine the influence of a categorical moderator. In multigroup analysis, the desired groups were created in SmartPLS dividing data-sample preferably dichotomous in nature such as high/low or young/old (Chin, 2010). Similarly, in the current study also experience and age have been created into two categories i.e. age (*young travellers and adult travellers*) and experience (*low experience and high experience*).

5.4.9. Age

The moderating effect of age was analysed using MGA as discussed earlier. The variable was categorical in the questionnaire. However it was not require further refining and dividing this variable in to sample sub-groups Henseler and Fassott (2010, p.720). Based on clustering technique the groups were identified and ANOVA test showed that the age differed between the two groups. The overall sample was divided into two categories young travellers and adult travellers. As the usage of Mobile-App found predominantly within the youth in the age of 20's and 30's, thus the group were named as young travellers who are in their early 20's and adult travellers who are in their early 30's and above. Within the *youth traveller* category there were total 553 out of which 501 (70%) were in age between 20-30 and remaining 52 (7%) were less than 20 years of age. Similarly, within the *adult traveller* category 153 respondents were in age between 31-40 and remaining 41 above. The results were obtained with the help of SmartPLS multigroup analysis method. Results indicated that age has the least indirect influence on the relationship i.e. SI→BI at 0.00 (p<0.05) rest paths as well does not statistically influenced the direct relationships i.e. EE→BI, PE→BI, FC→BU and BI→BU. The path coefficients (Refer Table 5.26) revealed that the highest significant path between the age groups *(adult traveller and young traveller)* for BI→BU (β=0.43 or 43%; 0.34 or 34%) followed by EE→BI (β=0.37 or 37% or 0.33 or 33%)), PE→BI (β=0.19 or 19% or 0.27 or 27%), FC→BU (β=0.08 or 0.8%; 0.16 or 16%) and the lowest significant path was between the groups SI→BI (β= 0.10 or 10%; 0.00 or 0.0%). The experienced young as well as adult traveller's social influence in both the groups were insignificant i.e. none of the group is influenced by their social networks. This result suggested that the direct relationships are not influenced by age i.e. **H1b, H2b, H3b** and **H4b** does not support the proposed hypothesis.

Table 5.26 Path coefficients and significance of age as moderator (p<0.05)

Hypotheses	Path Coefficients Adult Traveller	Path Coefficients Young Traveller	Adult x Younger (p-Value)
BI→BU	0.43	0.34	0.19
EE→BI	0.37	0.33	0.38
FC→BU	0.08	0.16	0.76
PE→BI	0.19	0.27	0.80
SI→BI	0.10	0.00	0.29

5.4.10 Gender

Gender was categorised as male and female, thus this variable further did not required any refinement. Out of 707 respondents, 489 were male and 218 were female. The results indicates that out of all direct paths only SI➔BI was found statistically significant at 0.02 (p<0.05), where females tend to use the Mobile-App due to the influence in their social circle than males. This result suggest that the direct relationships are partially influenced by gender i.e. **H3a** supported whereas **H1a,** and **H2a** not supported. The path coefficients shown in Table 5.27 for the reference.

Table 5.27 Path coefficients and significance of gender as moderator (p<0.05)

Hypotheses	Path Coefficients Female	Path Coefficients Male	Female x Male (p-Value)
BI➔BU	0.33	0.36	0.62
EE➔BI	0.33	0.35	0.58
FC➔BU	0.20	0.13	0.24
PE➔BI	0.24	0.27	0.63
SI➔BI	0.17	0.00	*0.02*

5.4.11. Experience

From Table 5.28, it is seen that direct paths EE➔BI is significant and PE➔BI, SI➔BI, FC➔BU and BI➔BU are non-significant in the results. The result indicates that travellers with low experience users tend to get influence in the absence of support system in order to use the Mobile-App. As a result, travellers who have less experience requires a consistent effort and easy to understand on how to use the Mobile-App.

Table 5.28 Path coefficients and significance of experience as moderator (p<0.05)

Hypotheses	Path Coefficients Low experience	Path Coefficients High experience	Low experience x High experience (p-Value)
BI➔BU	0.32	0.36	0.68
EE➔BI	0.32	0.18	*0.05*
FC➔BU	0.19	0.11	0.15
PE➔BI	0.30	0.37	0.51
SI➔BI	0.06	0.07	0.53

5.4.12. Customer typology

In order to examine the influence of customer typology on the direct path of the model, moderating influence was examined using SmartPLS. Due to the classification identified using clustering technique, four typologies were identified. To examine the influence for more than two groups in SmartPLS, influence can be identified by adding moderator in the conceptual framework. Multigroup analysis allows a researcher to examine the influence of a moderator when it is classified into two groups or sub-samples. Therefore, a moderating effect has been added into the conceptual framework for typology and a consistent PLS bootstrapping was run to identify the results. The influence of typology was examined through four independent variables EE→BI, PE→BI, SI→BI and FC→BU. The results indicated that traveller typology is statistically significant at 0.03 (p<0.05) and t-statistics at 2.15 (t<1.96). It is observed that the influence of other relationships were found insignificant by the moderator i.e. typology. Thus, it is concluded that the influence of typology is partially influencing the independent variables i.e. through facilitating conditions to behavioural usage of Mobile-App. This result suggest that the direct relationships are partially influenced by typology i.e. **H4a** supported and **H1c, H2d, H3d** unsupported. As a result, the findings of this test suggest that the customer typology (*worried, savvy, anxious and deal seekers*) are highly influenced by the unavailability of support system required to use the Mobile-App. The end usage is technically dependent on the support system provided by service provider in terms of data availability, Mobile-App ease of use, risk associated with transactions and information.

Table 5.29 Bootstrapping result for of typology (p<0.05)

Hypotheses	T Statistics	P Values
Typology moderating FC→BU	*2.15*	*0.03*
Typology moderating through EE→BI, PE→BI, SI→BI	0.6	0.55
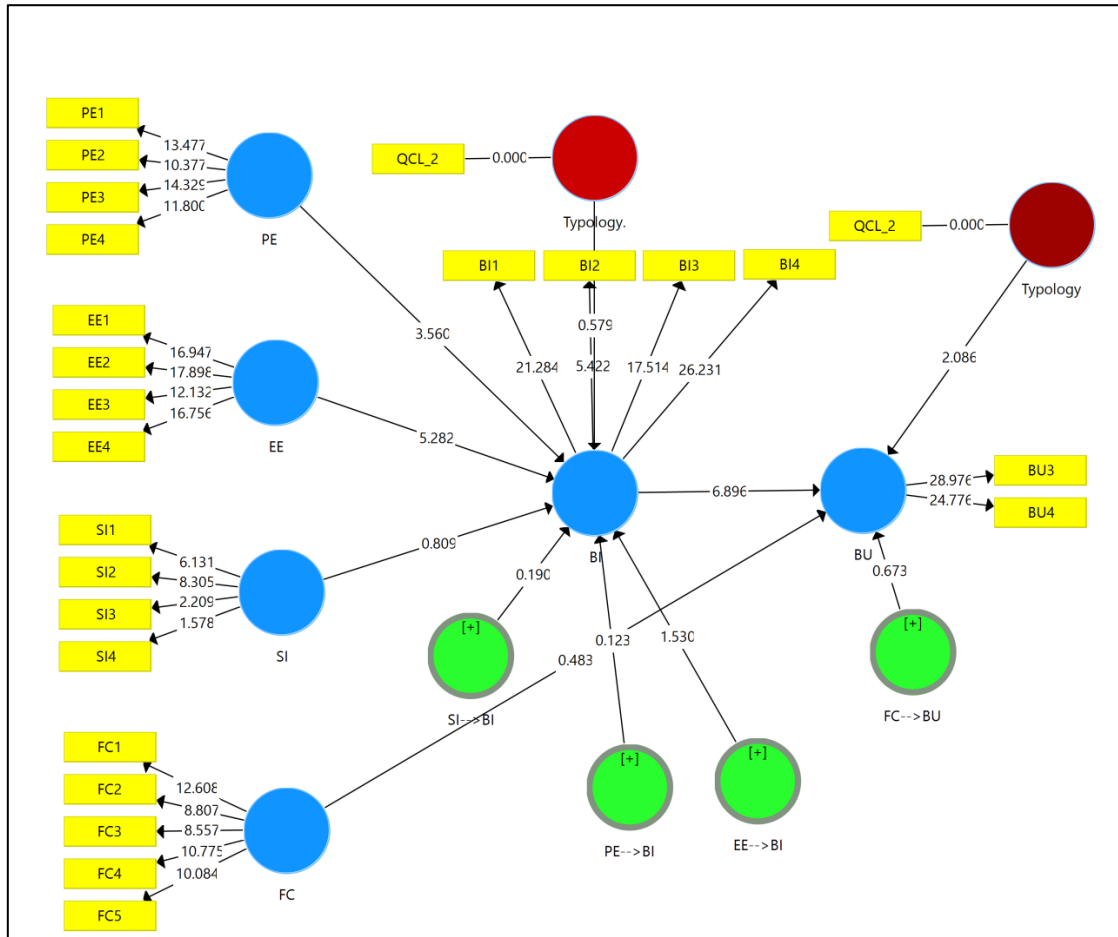
Figure 5.7 Path coefficients of typology

5.5 Result for hypotheses testing

This section discusses the results of the proposed hypotheses in the current study. The criteria to confirm individual hypothesis was based on the t-value for each path coefficient. The cut off criteria discusses above in the previous section i.e. <2 for an alpha level of 0.05 (Hair *et al.*, 2010).

Table 5.30 Hypotheses testing results

S. No.	Hypotheses	Result
H1	Performance Expectancy (PE) has a significant positive effect on Behavioural Intention (BI) of travellers to use Mobile-App	*supported*
H2	Effort Expectancy (EE) has a significant positive effect on Behavioural Intention (BI) of travellers to use Mobile-App	*supported*
H3	Social Influence (SI) has a significant positive effect on Behavioural Intention (BI) of travellers to use Mobile-App	not supported
H4	Facilitating Condition (FC) has a positive significant effect on Mobile-App usage of travellers	*supported*
H5	Behavioural intention (BI) has a positive significant effect on Mobile-App usage of travellers	*supported*
H1a	influence of Performance Expectancy (PE) on Behavioural intention (BI) is moderated by gender	not supported
H1b	influence of Performance Expectancy (PE) on Behavioural Intention (BI) is moderated by age	not supported
H1c	influence of Performance Expectancy (PE) on Behavioural Intention (BI) is moderated by typology	not supported
H2a	influence of Effort Expectancy (EE) on Behavioural Intention (BI) is moderated by gender	not supported
H2b	influence of Effort Expectancy (EE) on Behavioural Intention (BI) is moderated by age	not supported
H2c	influence of Effort Expectancy (EE) on Behavioural Intention (BI) is moderated by experience	*supported*
H2d	influence of Effort Expectancy (EE) on Behavioural Intention is moderated by typology	not supported
H3a	influence of SI on Behavioural Intention is moderated by gender	*supported*
H3b	influence of SI on Behavioural Intention (BI) is moderated by age	not supported
H3c	influence of SI on Behavioural Intention (BI) is moderated by experience	not supported
H3d	influence SI on Behavioural Intention (BI) is moderated by typology	not supported
H4a	influence of Facilitating Conditions (FC) on Mobile-App usage is moderated by typology	*supported*
H4b	influence of Facilitating Conditions (FC) on Mobile-App usage is moderated by age	not supported
H4c	influence of Facilitating Conditions (FC) on Mobile-App usage is moderated by experience.	not supported

5.6 CONCLUSION

The chapter summarises the data analysis and its results for the proposed research objectives in the current study. While Mobile-App usage the significant influencing factor observed in the results are effort expectancy (EE→BI) followed by performance expectancy (PE→BI) and facilitating conditions (FC→BU) respectively. The chapter discussed the results of the demographics as multi group analysis where results revealed that out of 14 moderating influence 4 are significant and 10 non-significant. The key contribution of the of the proposed model identified that typology as moderator based on risk perception and uses-and-gratifications found to be significantly influencing the relationship between FC→BU.

CHAPTER 6
DISCUSSION AND CONCLUSION

6.1. INTRODUCTION

In the current chapter, the findings of the study are summarized based on the research objectives. The chapter discusses the results, its contribution to theory and literature and its implications as well. Lastly, the future scope and the limitations of the study are also highlighted. The study investigated the determinants of behavioural usage through behavioural intentions of Mobile-App usage.

Additionally, it also examines the effect of introduced moderator based on risk perception and uses and gratification and other established three moderators- gender, age and experience on the usage of Mobile-App. In order to establish the typology as moderator, the study identified it using clustering techniques i.e. hierarchal and K-means clustering. Therefore, the current Chapter illustrates discussion of the results in Section 6.2; the contribution added to the literature of this domain in Section 6.3; the managerial applications for the travel agents and hoteliers of India in Section 6.4; and the suggestions for future research based on the barriers encountered in Section 6.5.

6.2. RESULTS DISCUSSION (Preliminary Study)

In the first phase, the preliminary study was conducted by those the Mobile-App users specifically. In addition, the instrument was also sent to the expertise in the respective domain before circulating the preliminary survey. Due to the limited literature on uses and gratification in travel and hospitality context, a validated scale was an issue, thus this stage revealed insights related to this context. The findings of this study discovered validation of the scales used in the instrument i.e. UTAUT, risk perception and refinement required for uses and gratification. In the context of the uses-and-gratifications, the findings indicated four constructs while running the principal component analysis. As suggested by Stafford and Stafford (2003), based on the findings of this, three factors were employed in the current study. On contrary, the preliminary study revealed four constructs in the current study context, subsequently

incorporated in the main study namely, promotional gratifications, functional gratifications, entertainment gratifications and social gratifications respectively.

6.3. RESULTS DISCUSSION

6.3.1. Determinants influencing Mobile-App usage

The first objective of this study fundamentally deals with the investigation of the determinants influencing the Mobile-App usage. The determinants influencing the usage of travellers was analysed with the help of SEM path coefficients using SmartPLS. The conceptual framework was based on the established technology adoption theory proposed by Venkatesh *et al.* (2003) i.e. UTAUT. The derived three direct determinants of BI were PE, EE, SI, and two other determinates of BU were FC and BI. Obtained findings in this study are consistent with UTAUT except the influence of SI→BI. The implication of this result is that, the travellers in case of using Mobile-App have no significant role. Instead of this, Mobile-App are more associated with experience, effort to use, performance of the app and the facilitating conditions provided/available to use them. The nature of such app is voluntary and highly dependent on the benefits, services a traveller receives at their end. It is therefore, concluded that effort expectancy, performance expectancy and facilitating conditions are direct influencing the intention and usage of the travellers further.

1. Performance Expectancy→Behavioural Intention

The findings of this relationship i.e. performance expectancy and behavioural intention is the second most important association among the three direct relationships in the framework. The t-test was statistically significant at 4.95 where the value of t (t<1.96) should be greater than 1.96. As a result, it indicates that the Mobile-App users are strongly concerned about the benefits in terms of value addition these applications are providing. These app are positively contributing and improvising their lifestyle in terms of travelling experiences, efficiency by saving time, hassle free and real time information and so on. In this way, the conclusion can be drawn that, the Mobile-App are indeed adding values where they have increased the convenience for professionals and students specifically, as they are the segment of user base using such app substantially.

2. Effort Expectancy→Behavioural Intention

The findings of this relationship i.e. effort expectancy and behavioural intention is the second most strong association among the three direct relationships in the framework. The t-test was statistically significant at 7.71 where the value of t (t<1.96) should be greater than 1.96. From the results, the conclusion can be drawn that Mobile-App users find them easy to understand, learn and access without any trouble. The experience of the Mobile-App users in the target sample constitutes 39% of those who have been using them for more than two years. Moreover, 49% of the respondents are professionals such as executive managers, area sales managers, tour managers, academicians and IT professionals, this clearly demonstrates that they are very much familiar and comfortable to use them and it requires less effort to use Mobile-App.

3. Social Influence→Behavioural Influence

The findings of this relationship i.e. social influence and behavioural intention are the non-significant and the only weak association among the three direct relationships in the framework. The percentage of the respondents in this study is 49.9% employed and 37.5% students, by virtue of education, access to review information regarding any technology, the non-significant finding of this determinant is rational. Additionally, the absence of the influence by social circle can be justified by their need and convenience to use them, despite the suggestions and recommendations while interacting socially for a particular period.

4. Behavioural Intention→ Behavioural Usage

The findings of this relationship i.e. behavioural intention and behavioural usage are the strongest statistically significant association in the framework. The t-test was statistically significant at 8.65 where the value of t (t<1.96) should be greater than 1.96. The result implicates that users with high intentions inclined to use the Mobile-App for searching travel and stay related information, make payments, read and provide reviews of the visited places. Taking the stated discussion into account, the result of factor loadings on usage of Mobile-App revealed that traveller prefer the app most for searching information and reading reviews than, conducting payments or providing

reviews. Therefore, the predominant usage of Mobile-App by is preferable for seeking destination and nearby locations, and reading their reviews/pictures posted in order to visit them further.

5.   Facilitating Conditions→Behavioural Usage

The findings of this relationship i.e. facilitating conditions and behavioural usage are the statistically significant association in the framework. The t-test was statistically significant at 3.21 where the value of t (t<1.96) should be greater than 1.96. The association of facilitating condition directly influences the usage of Mobile-App. The results in the study indicate that users have necessary resources and knowledge about these applications. Moreover, they are well informed about how to access such app also the devices they are using to access them are very much compatible with other devices. In view of the facts stated, it can be deduced that users who are familiar with the day-to-day transitions of the technology and frequently travelling are well aware of the technical support system required to access these app. These users are well informed about app updates, compatibility with other mobile or desktop devices, can access them by reading instructions or available tutorials on internet by travel vloggers/bloggers and aware of the support system in terms of customer care services as well.

6.3.2. Customers typology

The second objective was the aim to identify the typology of travellers based on risk perception and uses and gratification is the vital contribution in this study. The formation of groups based on the travellers homogenous attributes within each cluster and vigorous heterogeneity between the clusters is the primary objective behind the typology. Therefore, in the current study the results obtained four distinguished cluster namely, *worried travellers, savvy travellers, anxious travellers* and *deal seekers*. The findings indicated that these travellers perceives certain risks and gratifications on high preferences and rest on lower preferences.

6.3.3. Influence of customer typology

The third objective of the study was to explore the effect of typology on three direct relationships and facilitating condition on usage behaviour.

The results identified in the study suggested that typology has statistical significant influence on behavioural usage. On the other hand, the findings for the direct relationship between PE➔BI, EE➔BI and SI➔BI were not significant.

The customer typology effect of typology on usage through facilitating conditions is due to the immediate usage associated with barriers and drivers of travelling app. The statements asked in the survey for RP and U&G were based on their usage of Mobile-App, therefore the customer typology effect of typology on FC➔BU is justified in the context of the current study. The results implicate that these risks and gratifications are experiences as barriers and drivers. Consequently, the absence of support system in terms of facilitating condition influences the usage behaviour, where the lack of it determines the level of usage as high or low by Mobile-App usage.

6.3.4. Influence of age, gender and experience

The fourth objective of the study was to explore the customer typology effect of age, gender and experience of using Mobile-App. The results suggested in the study are as follows:

1. Age

The sample comprises of 707 respondents among which 553 respondents were in the category of young travellers and 154 respondents were adult travellers. Among 553, 501 belong to the age group of 20-30 and 51 belong to the age group of less than 20. Lastly, among 154 respondents, 109 belong to the age group of 31-40, 31 respondents belong to the age group of 41-50 and 14 respondents were 50 above. There is no statistical significant customer typology effect of age on the relationship of PE➔BI, EE➔BI, SI➔BI and FC➔BU among young and adult travellers. On the other hand the path coefficients of EE➔BI states that, young travellers perceives 33% of effort to use Mobile-App when compared to 37% of efforts given by adult travellers, the results implicates that adult travellers requires more effort to use Mobile-App than young travellers. Similarly, another path coefficient between FC➔BU indicates that facilitating conditions perceived by young travellers (16%) is of importance when compared to adult travellers (1%). This clearly indicates that the young travellers are

the frequent users of Mobile-App than the adult travellers and expect a robust support system to use such applications on their smartphones.

2. Gender

In order to explore the customer typology effect of gender on direct paths of the conceptual framework, the results demonstrates that gender has partial influence on intention to use the Mobile-App. Among the three direct paths, there was no statistical significant difference between males and females for PE→BI and EE→BI except SI→BI. The results imply that female travellers have significant influence of their social circle (friends, family, and colleagues) in terms of intent to use Mobile-App than male travellers.

3. Experience

To identify the customer typology effect of experience, it was classified into two segments i.e. low experienced and high experienced. Both the groups perceived similarities in terms of the influence of independent variable (PE and SI) on behavioural intentions. On the other hand, users of Mobile-App with low experience influence the relationship between EE→BI. This implication of this finding suggest that travellers when are newly introduced to app or do not use them frequently requires more efforts that determine their behavioural intentions. As a result, this influences their frequency of usage behaviour also.

6.4. Contribution to theory

This study can bestow the scarce literature of Mobile-App users. Besides this, it also reveals the significant relevance of typology to identify the precise inhibitors and drivers of app users. It is therefore, testifies the contribution in terms of theoretical understanding with a focus on Indian travellers. To the best of the author's knowledge, this study is first of its kind that explores the influence of customer typology on direct relationships using UTAUT model, specifically in travelling and hospitality context. In this way, the study also bridges the gap by contributing in the domain literature. The findings of the study indicates that the extended model contributes a comprehensive addition in to the literature with the help of empirical evidences in this area. The study

propose future directions for upcoming technology innovation and the influence of various risk and gratifications on usage behaviour. The proposed model developed in the current study is comprehensive despite the low variance explained than the grounded theory i.e. UTAUT. The proposed model was examined by integrating the key predictors in unified theory of acceptance and use of technology (UTAUT) and further implementing it into new context i.e. India. The extended model was proposed to identify and validate other fundamental variables suggested in the previous literature on mobile commerce adoption. In order to fill the stated gap, theoretical relationships were modelled using UTAUT by integrating moderator with the help of risk perception (RP) and uses-and-gratifications (U&G). The extended framework variance explained was moderate in behaviour intention (R^2=29.5%) and usage behaviour (R^2=29.5%) using SmartPLS. The implication of the suggests that usage behaviour of Mobile-App for travelling and hospitality context is still in the progressive stage, and continuing usage behaviour is yet to be increased in the coming future. As a result, With the available yet limited literature on Mobile-Application usage in India, the current study also addresses this research gap. Additionally, the study also contributes in the literature of uses and gratification with the help of a validated scale using four parameters in the context of travelling mobile applications usage in India. The study also, imparted the knowledge of validated scales of risk perception and uses and gratification in the Indian context for Mobile-App. Considering the results, the study supports the work of Venkatesh *et al.* (2003) except the relationship between SI→BI.

6.5. Implications for practice

The findings of the study indicate a list of observations for the online travel companies in India. The results showed strong significant relationship between FC→BU, this clearly indicated that despite the growing usage of Mobile-App there is still a lack of robust support system in terms of information availability as how to access for the user-end. Additionally, users still face difficulties using Mobile-App that are incompatible with their devices. Therefore, this finding may help the online travelling companies to provide sufficient information on how to use their app if a user experience difficulty accessing them, also to improvise their applications to be compatible across the mobile platforms and operating systems. In order to connect the gaps of travelling app users

contributing in Indian tourism and hospitality industry, the study provided novel insights that evidently showed that experience and gender has a significant role to play. In addition to this, this study also explored the influence of customer typology based on their perceived risk and uses-and-gratifications. The obtained findings of this objective suggested that customer typology influences the relationship between FC→BU. This indicated that the perceived risks that inhibits them to use Mobile-App impacts their usage at the same it is applicable to their distinguished gratifications that still drives them to use Mobile-App, the possible reason behind this could be the collective push in the market to use such app. For example, user may continue to use Mobile-App due the comfortability towards a particular app-interface. Lastly, it can also provide in-depth insights to the travel giants such as Tripadvisor, Makemytrip and so on. Especially, to those who offer the services through their web portal as well through Mobile-App will indicate them targeting the Mobile-App users based on their respective segments will help them develop and improvise the applications accordingly. The study will help the travel and tourism sector to understand the technology trends in the market that will assist them to segment and target their potential travellers.

In order to connect the gaps of Mobile-App users in Indian tourism and hospitality industry it can provide novel insights which evidently has shown that experience has a significant role to play for Mobile-App users. Also, major contribution of this study is the typology based on users risk perception and uses-and-gratifications which also plays an imperative role to target while addressing the challenges Indian travellers experience while using their app. Therefore, this study can be facilitating information to and for Mobile-App developers, hoteliers and tourism personnel in order to target and segment the potential users based on their typology.

This study will be able to help the managers to identify the behaviour of their guests, who access mobile devices using various travelling app to make bookings. It will also assist and spur the managers in providing extensive knowledge to understand their users segments in order to implement customized strategies efficiently. In furtherance of doing so, they can target these segments according to the user's customized choices and preferences to increase the retention rate.

6.6 LIMITATIONS AND SCOPE FOR FURTHER RESEARCH

The current study focused on the Mobile-App users in India. The study indeed provided insights about the behavioural aspects of Indian travellers using such applications for their travel and hospitality purposes. The imperative findings of this study were related to the influence of perceived risk and gratifications on Mobile-App usage. Despite the key contributions, the study has its own limitations that provide directions and scope future research. Therefore, the listed limitations are as follows:

1. The current study explores the behavioural intentions and usage behaviour Mobile-App usage, thus generalization towards hospitality sector requires precautionary steps.

2. Due to phenomenal emergence of various Mobile-App, the behaviour may vary in terms of evolving services being provided by such applications for travel and hospitality purposes.

3. The study also indicates a scope for future research by implementing mixed method approach. That will assist to understand other hedonic motivations and barriers while using such application that has not been explored due to the established scales in the literature

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<u>**Questionnaire Cover Letter**</u>
Survey on "MOBILE-APP ADOPTION IN TOURISM AND HOSPITALITY: UNDERSTANDING INFLUENCE OF CUSTOMER TYPOLOGY BASED ON USES, GRATIFICATION AND RISK PERCEPTION"

Dear Madam/Sir,

I am a PhD Scholar in Department of Management Studies, Malaviya National Institute of Technology (Jaipur). I hereby seek your cooperation and request you to spare your valuable time for filling up this questionnaire. I am conducting a research on *"MOBILE-APP ADOPTION IN TOURISM AND HOSPITALITY: UNDERSTANDING INFLUENCE OF CUSTOMER TYPOLOGY BASED ON USES, GRATIFICATION AND RISK PERCEPTION".* The main purpose of this research is to study the behavioural intentions of mobile application user for tourism and hospitality. I assure you of confidentiality and the information will be used collectively for research purpose only.

Thanking for your participation and helping us in carrying out this research.

Sincerely,

Mayanka Singh Chhonker

Research Scholar

Email Id: 2013rbm9544@mnit.ac.in

SECTION: 1 RESPONDENT INFORMATION

(Please insert a check mark (√) in the appropriate column)

a. Gender □ Male □ Female

b. Age *(Fill in whole numbers)* □ below 20 □ 20-30 □ 31-40 □ 41-50 □ 51 above

c. Occupation □ Student □Employed □ Self employed □ Not-Working

d. Which Mobile devices do you own?

□ Smartphone □ Tablet □ Normal/feature phone

e. Your purpose of using Mobile App

□ Texting/chat □ Gaming
□ Travel (Flight/Train/Bus/Cab) □ Sending/Receiving Mails
□ Entertainment/Fun □ Searching Information on Internet
□ Hotel/Resorts/Guest House □ Shopping
□ Food and Beverage □ Sharing Pictures/Media files
□ Others *(please indicate)*

f. How many Mobile App do you have currently in your phone?
□ Less than 5 □ 5-10
□ 10-20 □ 20-30
□ More than 30

g. Which Mobile App do you use for tourism & hospitality purpose (e.g. hotels, travel, restaurants)

□ Makemytrip □ Goibibo □ Trip Advisor □ Yatra.com

□ Expedia □ Oyo Rooms □ Google Maps □ Trivago

□ RedBus □ Ola Cabs □ Cleartrip □ Ixigo

□ Airbnb □ IRCTC □ Others *(please indicate)* _____

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SECTION 2: MOBILE APPLICATION USAGE

Please indicate your level of agreement with the following statements by placing a check mark (√) in the appropriate column on 5-point Likert scale *with regard to tourism & hospitality mobile applications*
1=strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree

Performance Expectancy

2.2	Mobile App helps me to do things quickly	□	□	□	□	□
2.3	Mobile App are convenient in acquiring information	□	□	□	□	□
2.4	Mobile App increases my efficiency	□	□	□	□	□
2.5	Mobile App enables me to complete my journey effectively without any hassle	□	□	□	□	□

Effort Expectancy

2.6	It's easy to use mobile app	□	□	□	□	□
2.7	It's easy to learn how to use Mobile App	□	□	□	□	□
2.8	My interactions with Mobile App are clear and understandable	□	□	□	□	□
2.9	It's easy to understand the operation of Mobile App	□	□	□	□	□

Social Influence

2.10	People who influence my behaviour think that I should use Mobile App	□	□	□	□	□
2.11	People who are important to me (such as family, peers, friends, etc.) think that I should use Mobile App	□	□	□	□	□
2.12	People guide me to use Mobile App	□	□	□	□	□
2.13	I use Mobile App because many people are using them	□	□	□	□	□

Facilitating Conditions

2.14	I have the necessary resources to use Mobile App	□	□	□	□	□
2.15	I have the necessary knowledge to use Mobile App	□	□	□	□	□
2.16	It is easy for me to get information on how to use Mobile App	□	□	□	□	□
2.17	It is easily compatible with other technologies I use	□	□	□	□	□
2.18	I can get help from others when I have difficulties using Mobile App	□	□	□	□	□

Behaviour Intention

2.19	I intend to continue using Mobile App	□	□	□	□	□
2.20	I will always try to use Mobile App	□	□	□	□	□
2.21	I have used Mobile App in the past 4 weeks	□	□	□	□	□
2.22	Overall, I use Mobile App a lot	□	□	□	□	□

Experience

i. Since how long you have been using any tourism & hospitality mobile applications

6 months or less	□
7-12 months	□
13 -18 months	□
19 – 24 months	□
25 months or more	□

SECTION: 3 RISK PERCEPTION

Please indicate your level of agreement with the following statements by placing a check mark (√) in the appropriate column on 5-point Likert scale *with regard to tourism & hospitality mobile applications*
1=strongly disagree, 2 = disagree, 3= neutral, 4 = agree, and 5 = strongly agree

Financial Risk

3.1	I worry about monetary loss while using Mobile App	□	□	□	□	□
3.2	I worry about potential risks/fraud while using Mobile App	□	□	□	□	□
3.3	I worry I'll not get refunds from service provider	□	□	□	□	□

Performance Risk

3.4	I worry whether Mobile App will really perform as it is supposed to	□	□	□	□	□
3.5	I worry about the substandard performance of mobile app than desktops	□	□	□	□	□
3.6	I worry the efficiency of Mobile App differ from what I expect	□	□	□	□	□
3.7	I worry that the Mobile App does not provide the level of benefits that I would be expect	□	□	□	□	□
3.8	I worry (Wi-Fi, mobile data packs) Mobile App does not perform well because of slow internet connection	□	□	□	□	□

Time Risk

3.9	I take time to learn how to operate Mobile App	□	□	□	□	□
3.10	Mobile App run slow and lead to loss of time	□	□	□	□	□
3.11	Mobile App can lead to wastage of time	□	□	□	□	□
3.12	Mobile App will lead to waste of time due to payment errors	□	□	□	□	□

Psychological Risk

3.13	I feel uncomfortable while using Mobile App	□	□	□	□	□
3.14	I feel anxious while using Mobile App	□	□	□	□	□
3.15	I feel nervous while using Mobile App	□	□	□	□	□

Privacy Risk

3.16	I worry about my personal information using Mobile App	□	□	□	□	□
3.17	I worry that on using Mobile App my payment information may be stolen	□	□	□	□	□
3.18	I worry about using Mobile App because my signing account can be hacked	□	□	□	□	□

Social Risk

3.19	I think using Mobile App will negatively affect the way others think of me	□	□	□	□	□
3.20	My peers will hold me in high esteem, if I use Mobile App	□	□	□	□	□
3.21	My friends think I am showing off if I am using Mobile App	□	□	□	□	□
3.22	Mobile App would provide me with a higher social status	□	□	□	□	□

SECTION 4: USES-AND-GRATIFICATIONS

Please indicate your level of agreement with the following statements by placing a check mark (√) in the appropriate column on 5-point Likert scale *with regard to tourism & hospitality mobile applications*
1=strongly disagree, 2 = disagree, 3= neutral, 4 = agree, and 5 = strongly agree

Promotional Gratification	1	2	3	4	5
4.1 It provides me with special offers from restaurants or hotels	□	□	□	□	□
4.2 I could receive exclusive promotions	□	□	□	□	□
4.3 I could receive a mobile coupon from restaurants or hotels	□	□	□	□	□

Functional Gratification					
4.4 It's helpful to get accurate information anywhere, anytime (airline ticket/hotel tariff)	□	□	□	□	□
4.5 It's helpful in reservations/bookings (airline ticket/hotel room/rental car)	□	□	□	□	□
4.6 It's helpful to know the reviews of other travellers (places/product/services)	□	□	□	□	□
4.7 It's helpful to see photos of places visited by travellers	□	□	□	□	□
4.8 It's helpful to access information faster than any other sources	□	□	□	□	□
4.9 It's helpful to navigate the locations (restaurants/cafes/hotel)	□	□	□	□	□
4.10 It's helpful to search nearby destinations based on review/ratings (restaurants/cafes/hotel)	□	□	□	□	□

Social Gratification					
4.11 It's helpful to see if others feel the same way about a service as I do	□	□	□	□	□
4.12 It's helpful to compare my own evaluation with that of others	□	□	□	□	□
4.13 It's helpful to share my views/reviews	□	□	□	□	□
4.14 It's helpful to discuss about a product/service immediately with other travellers	□	□	□	□	□
4.15 I feel good when I share my travelling experience with others	□	□	□	□	□
4.16 I want others to feel I am an important source of information	□	□	□	□	□

Entertainment Gratification					
4.17 I enjoy using mobile app	□	□	□	□	□
4.18 It is entertaining	□	□	□	□	□
4.19 It's fun to use	□	□	□	□	□
4.20 It's exciting to use	□	□	□	□	□
4.21 It's entertaining to know about different places	□	□	□	□	□

Behaviour Usage

j. Please indicate if you have engaged with the following with regard to tourism & hospitality mobile applications (**1=never, 2=rarely, 3= sometimes, 4= frequently, 5= always**)

I use mobile app to search information	□	□	□	□	□
I use mobile app to make payments	□	□	□	□	□
I use mobile app to read review/feedback	□	□	□	□	□
I use mobile app to provide review/feedback	□	□	□	□	□

ANNEXURE –II: SUMMARY OF THE RESPONDENTS

S. No.	City	Frequency	Sample size	Percentage
1	New Delhi	129	707	18.2
2	Jaipur	96	707	13.5
3	Bengaluru	43	707	6.08
4	Mumbai	39	707	5.52
5	New Delhi	38	707	5.37
6	Hyderabad	31	707	4.38
7	Gurgaon	29	707	4.10
8	Roorkee	22	707	3.11
9	Pune	20	707	2.83
10	Noida	20	707	2.83
11	Chennai	15	707	2.12
12	Agra	14	707	1.98
13	Surat	14	707	1.98
14	Indore	12	707	1.70
15	Kanpur	9	707	1.27
16	Rajahmundry	8	707	1.13
17	Bhopal	7	707	0.99
18	Lucknow	7	707	0.99
19	Guwahati	7	707	0.99
20	Bikaner	6	707	0.85
21	Coimbatore	6	707	0.85
22	Nellore	6	707	0.85
23	Ahmedabad	5	707	0.71
24	Ghaziabad	5	707	0.71
25	Kolkata	5	707	0.71
26	Bhubaneswar	4	707	0.57
27	Chandigarh	4	707	0.57
28	Jodhpur	4	707	0.57
29	Mohali	4	707	0.57
30	Allahabad	3	707	0.42
31	Ernakulam	3	707	0.42
32	Mangalore	3	707	0.42
33	Ooty	3	707	0.42
34	Shimla	3	707	0.42
35	Udaipur	3	707	0.42
36	Vadodara	3	707	0.42
37	Varanasi	3	707	0.42
38	Alwar	2	707	0.28
39	Ambala	2	707	0.28
40	Anand	2	707	0.28
41	Bhongir (AP)	2	707	0.28

S. No.	City	Frequency	Sample size	Percentage
42	Cochin	2	707	0.28
43	Dehradun	2	707	0.28
44	Gwalior	2	707	0.28
45	Kanpur	2	707	0.28
46	Kharagpur	2	707	0.28
47	Kota	2	707	0.28
48	Nagpur	2	707	0.28
49	Patiala	2	707	0.28
50	Ranchi	2	707	0.28
51	Srinagar	2	707	0.28
52	Karnal	2	707	0.28
53	Agartala	1	707	0.14
54	Aligarh	1	707	0.14
55	Ananthapuramu	1	707	0.14
56	Ankleshwar	1	707	0.14
57	Bharuch	1	707	0.14
58	Bilaspur	1	707	0.14
59	Budaun UP	1	707	0.14
60	Buldana	1	707	0.14
61	Chirawa	1	707	0.14
62	Deoghar	1	707	0.14
63	Faridabad	1	707	0.14
64	Gaya	1	707	0.14
65	Graz austria	1	707	0.14
66	Guntur	1	707	0.14
67	Hamirpur	1	707	0.14
68	Hisar	1	707	0.14
69	Howrah	1	707	0.14
70	Jammu	1	707	0.14
71	Jamshedpur	1	707	0.14
72	Kakinada	1	707	0.14
73	Kannauj	1	707	0.14
74	Karur (TN)	1	707	0.14
75	Kashipur	1	707	0.14
76	Kochi	1	707	0.14
77	Kozhikode	1	707	0.14
78	Madurai	1	707	0.14
79	Mandi	1	707	0.14
80	Mathura	1	707	0.14
81	Moradabad (UP)	1	707	0.14
82	Morbi (Gujarat)	1	707	0.14
83	Muzaffarnagar	1	707	0.14
84	Mysuru	1	707	0.14

S. No.	City	Frequency	Sample size	Percentage
85	Nadiad (Gujarat)	1	707	0.14
86	Nilgiris	1	707	0.14
87	Pondicherry	1	707	0.14
88	Rudrapur	1	707	0.14
89	Saharanpur	1	707	0.14
90	Salem (TN)	1	707	0.14
91	Sonepat	1	707	0.14
92	Sultanpur (UP)	1	707	0.14
93	Thiruvananthapuram	1	707	0.14
94	Tiruchirappalli	1	707	0.14
95	Vijaywada	1	707	0.14
96	Visakhapatnam	1	707	0.14

Following figures show the normal Q-Q plots for all the variables measured on a 5 point Likert type scale

Performance Expectancy

Effort Expectancy

Normal Q-Q Plot of REGR factor score 3 for analysis 1
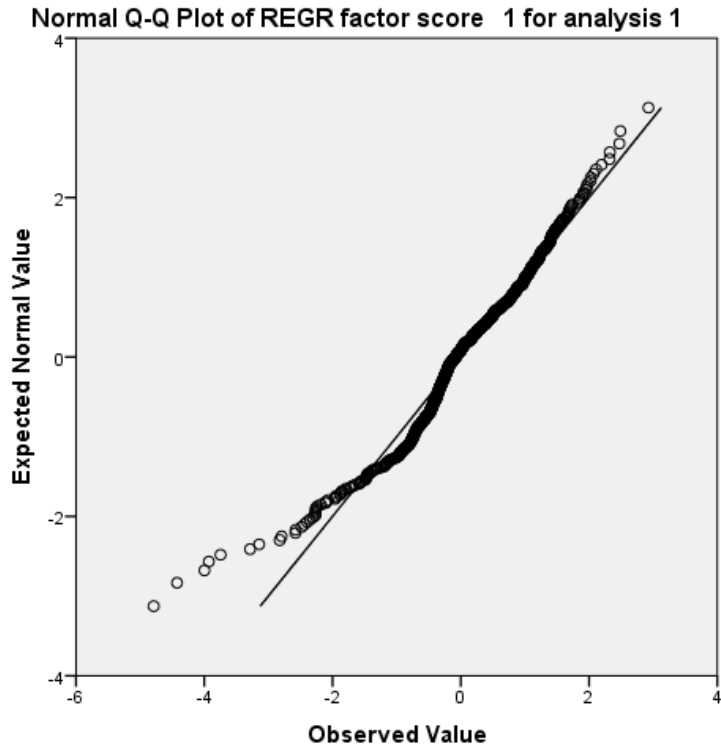
Social Influence
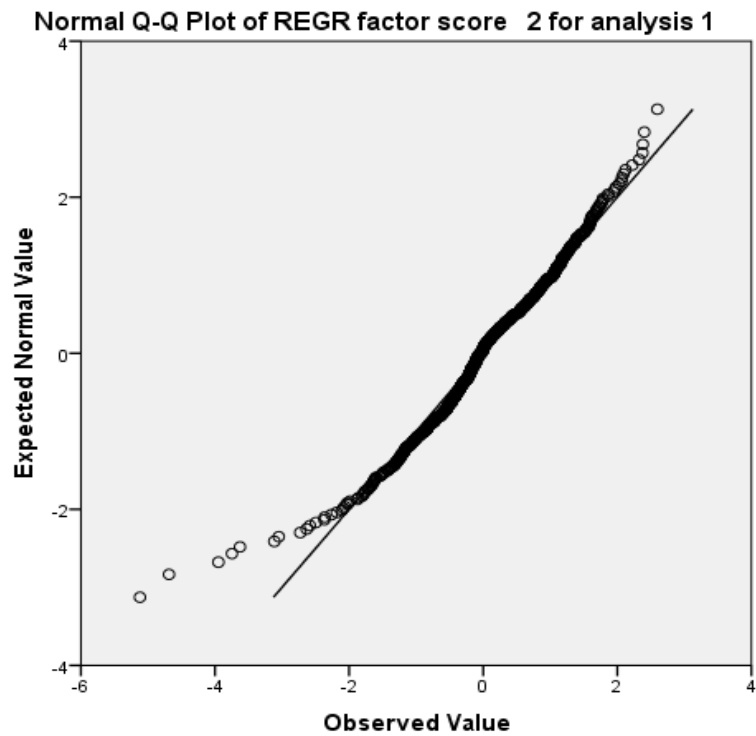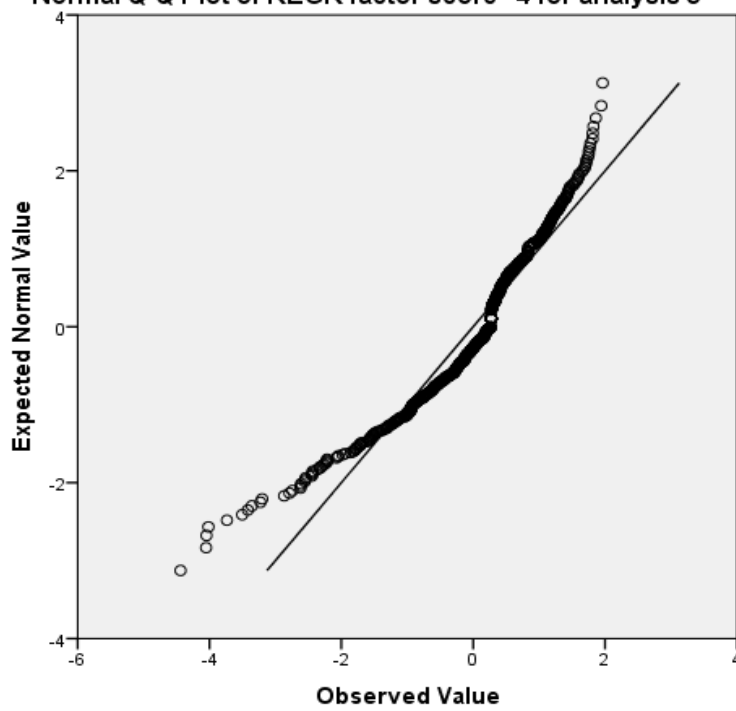

Normal Q-Q Plot of REGR factor score 4 for analysis 1
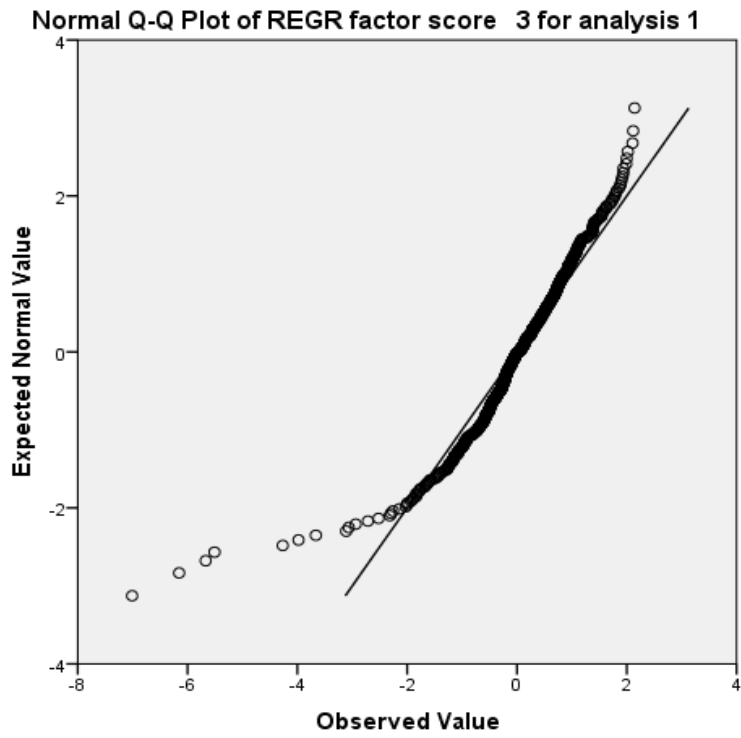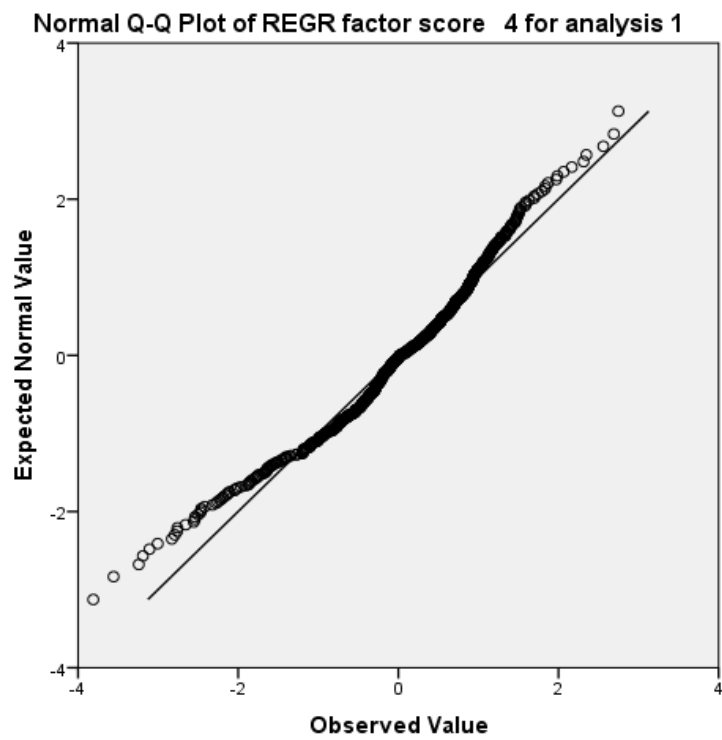
Facilitating Condition

Normal Q-Q Plot of REGR factor score 5 for analysis 1
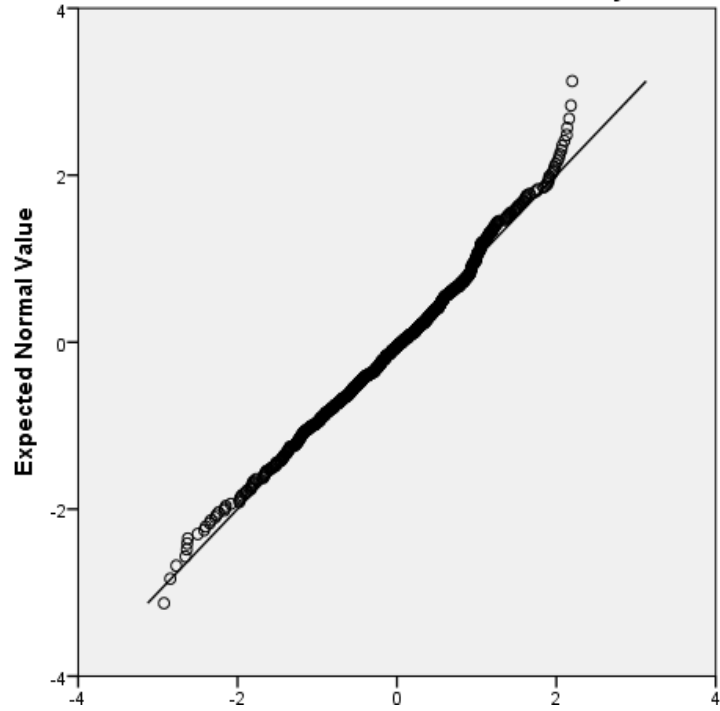
Behaviour Intention

Normal Q-Q Plot of REGR factor score 6 for analysis 1
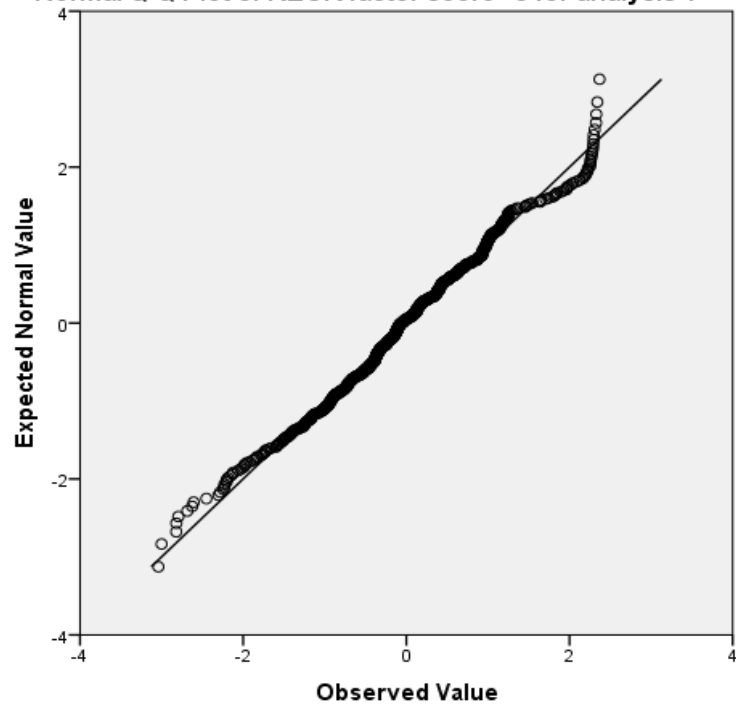
Usage Behaviour

Normal Q-Q Plot of REGR factor score   1 for analysis 3
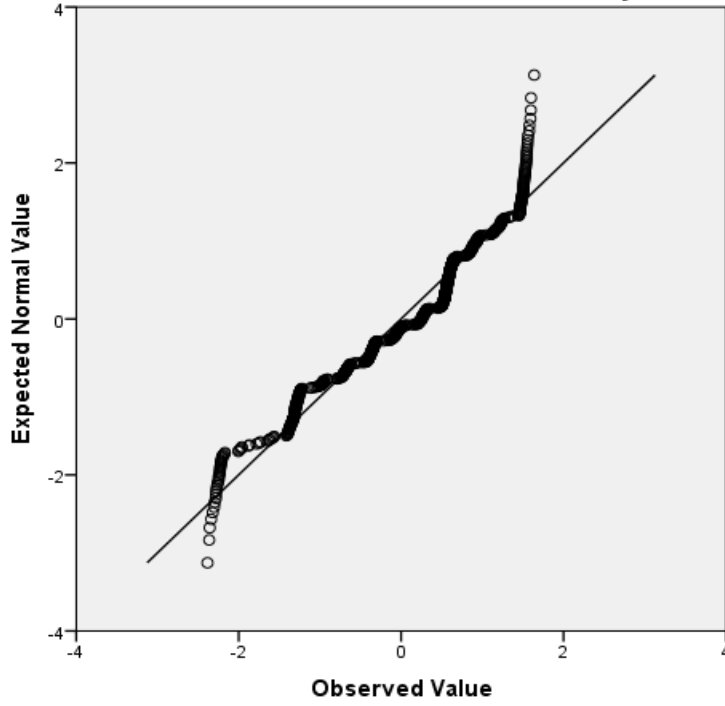
Financial Risk

Normal Q-Q Plot of REGR factor score   2 for analysis 3
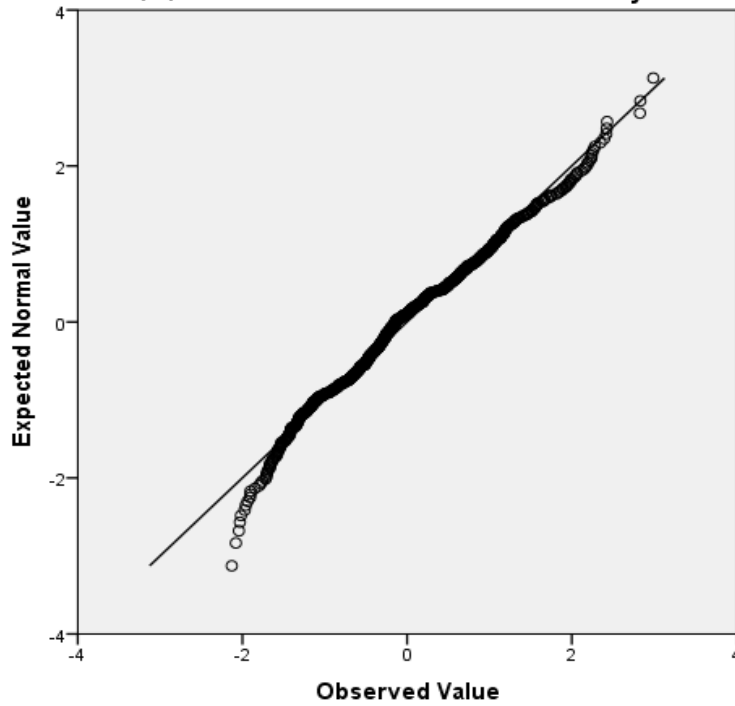
Performance Risk

Normal Q-Q Plot of REGR factor score 3 for analysis 3
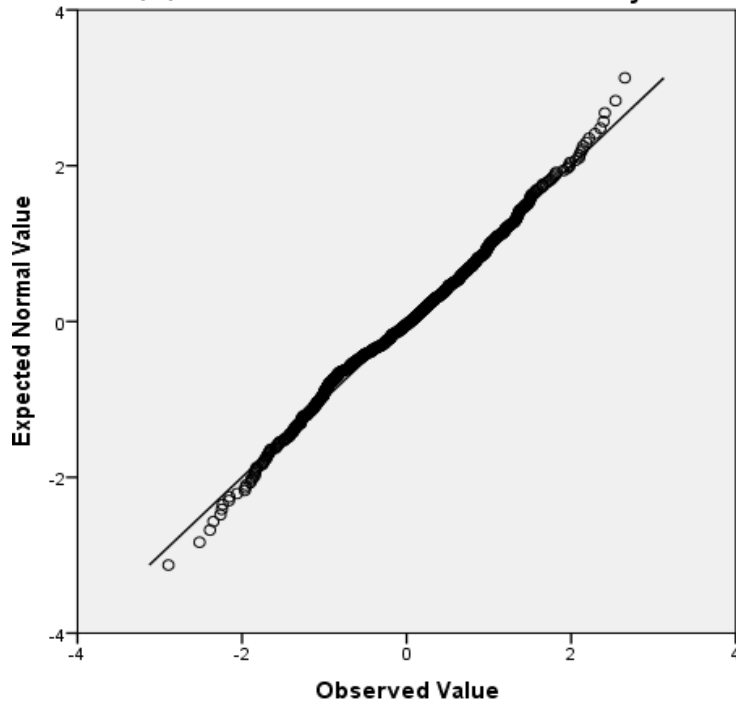
Time Risk

Normal Q-Q Plot of REGR factor score 4 for analysis 3
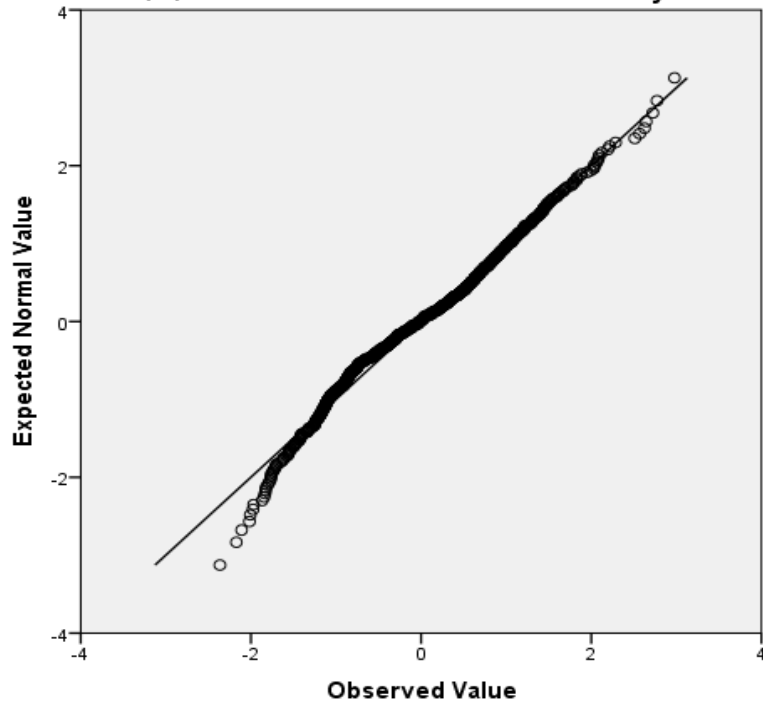
Psychological Risk

Normal Q-Q Plot of REGR factor score 5 for analysis 3
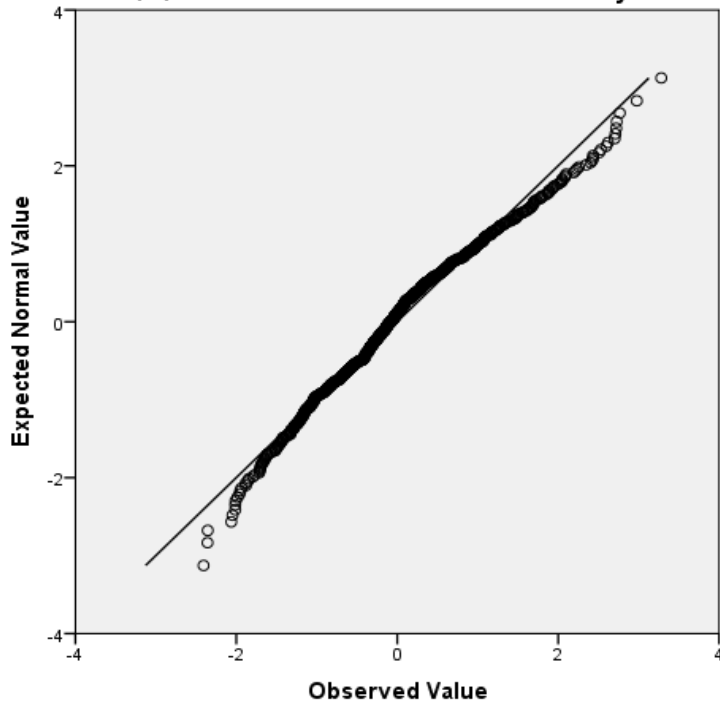
Privacy Risk

Normal Q-Q Plot of REGR factor score 6 for analysis 3
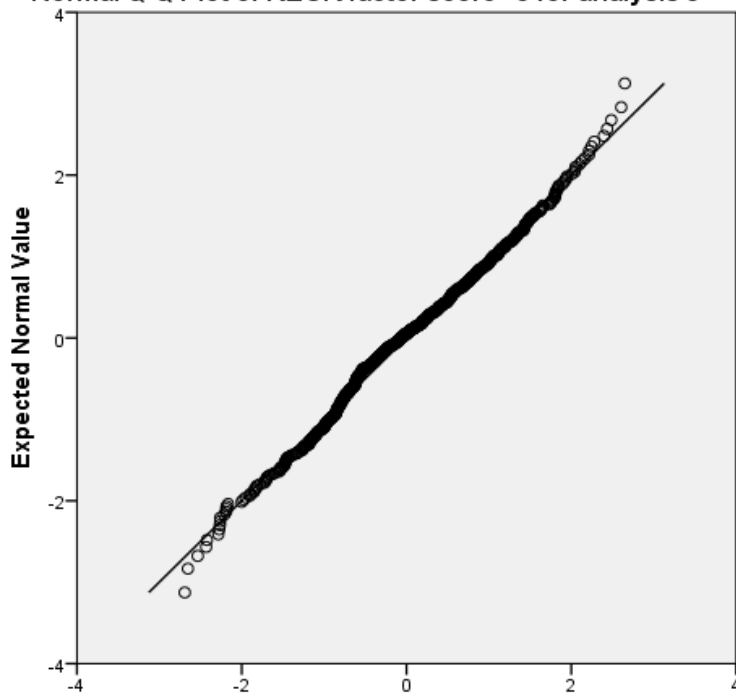
Social Risk

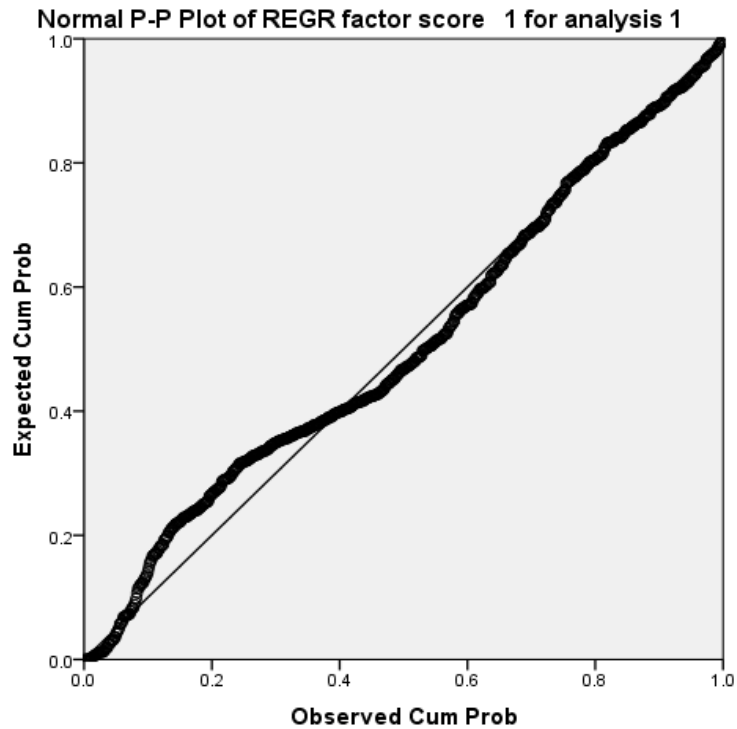Normal Q-Q Plot of REGR factor score 1 for analysis 5
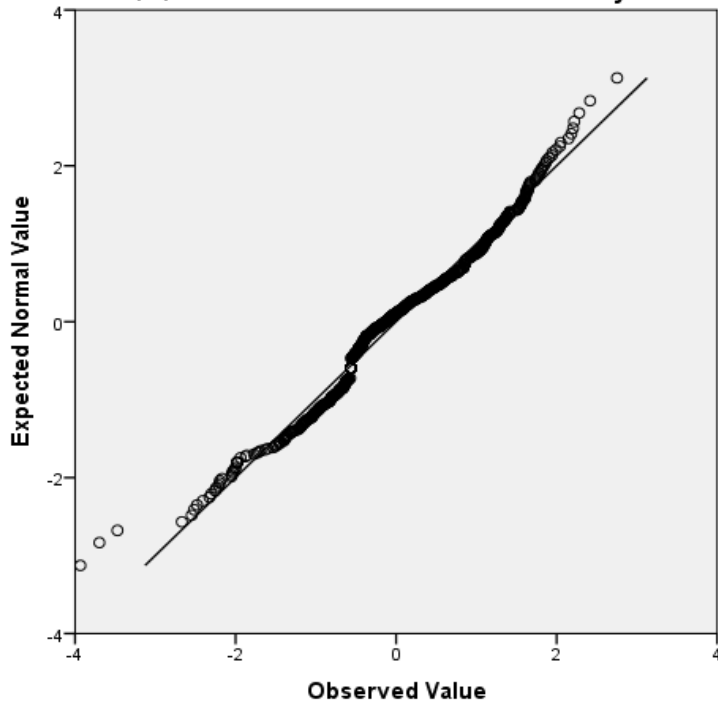
Promotional Gratification
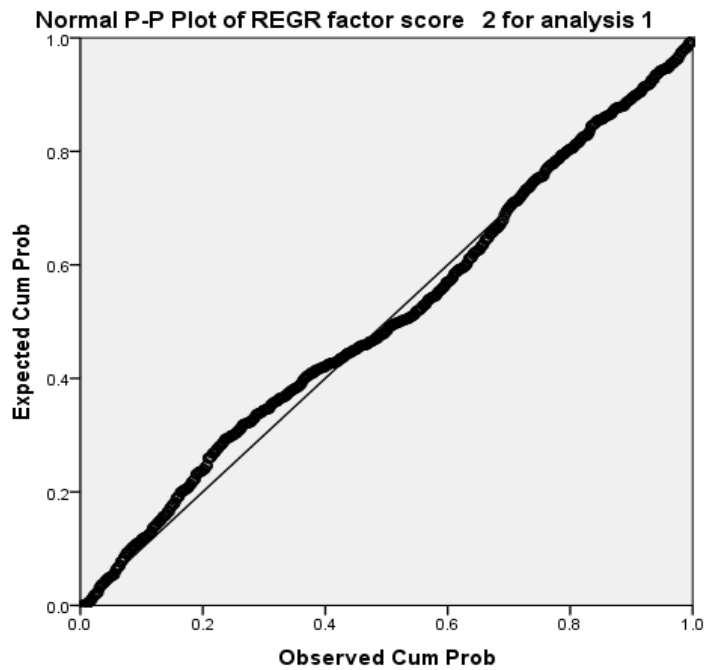

Normal Q-Q Plot of REGR factor score 2 for analysis 5

Functional Gratification

Social Gratification

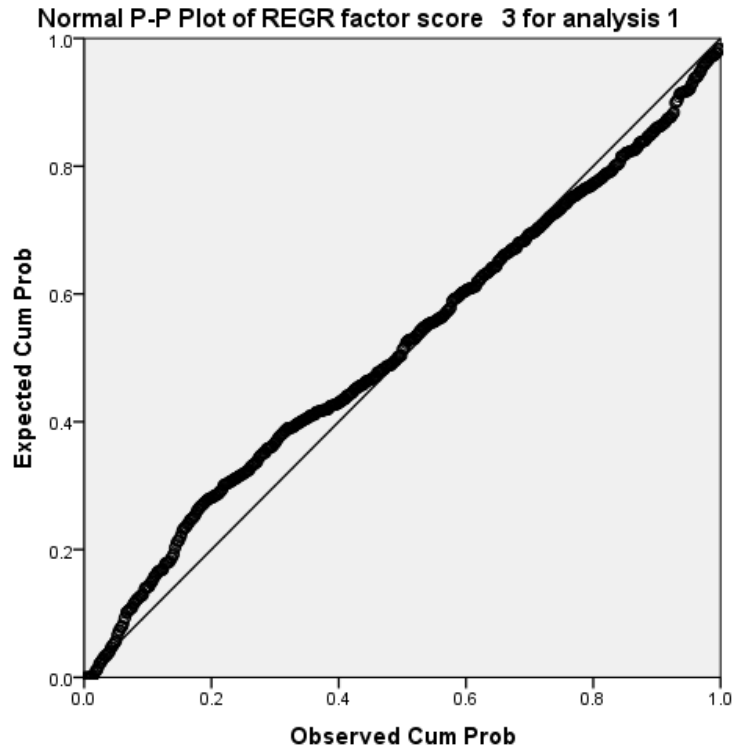**Entertainment Gratification**

Following figures show the P-P plots for residuals for dependent variables measured on a 5-point Likert type scale.

Performance Expectancy

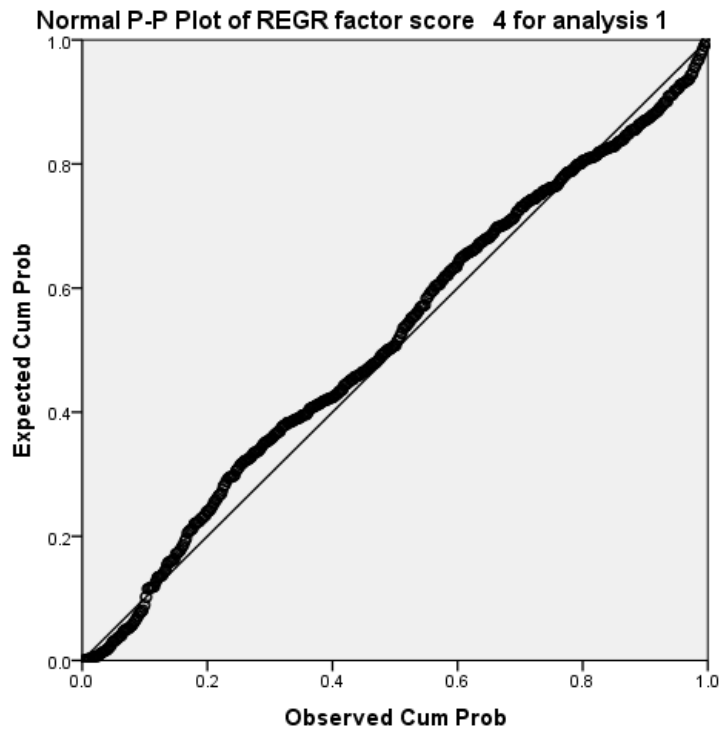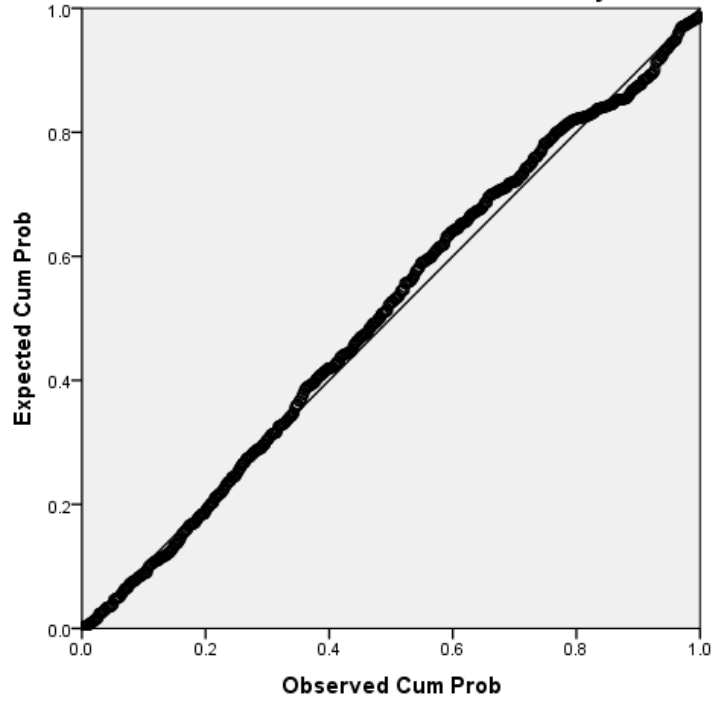## Effort Expectancy

Normal P-P Plot of REGR factor score   3 for analysis 1

Social Influence

Normal P-P Plot of REGR factor score   4 for analysis 1
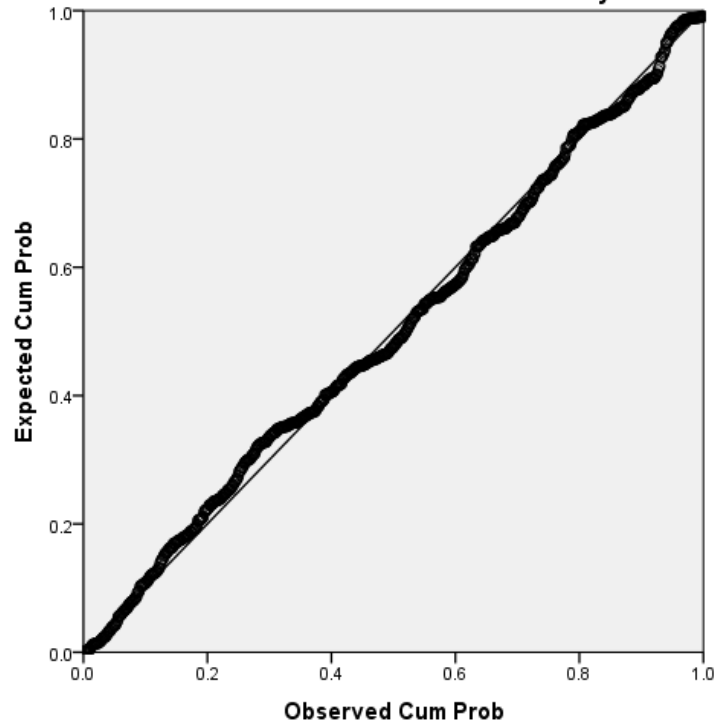
Facilitating Conditions

Normal P-P Plot of REGR factor score 5 for analysis 1

Behaviour Intention

Normal P-P Plot of REGR factor score 6 for analysis 1

Usage Behaviour

Normal P-P Plot of REGR factor score   1 for analysis 3

Financial Risk

Normal P-P Plot of REGR factor score   2 for analysis 3
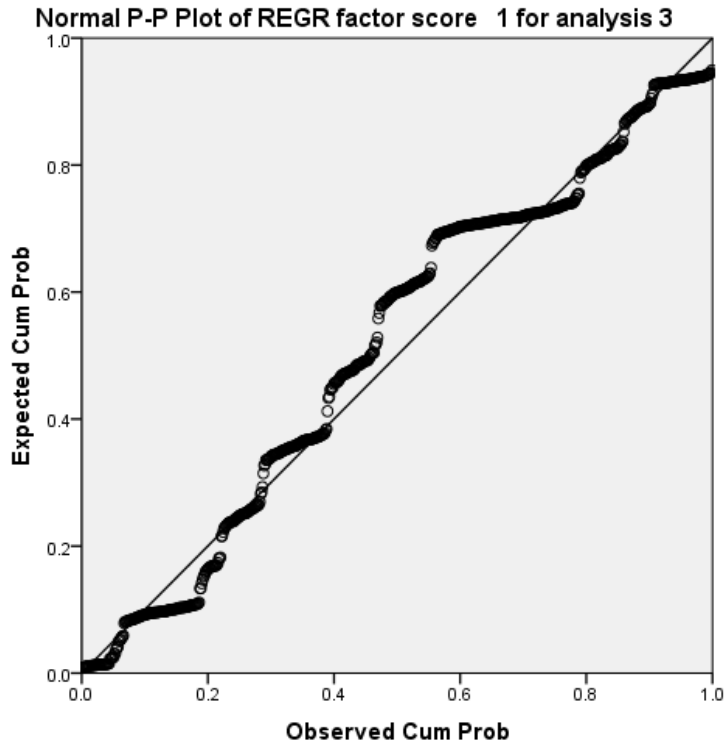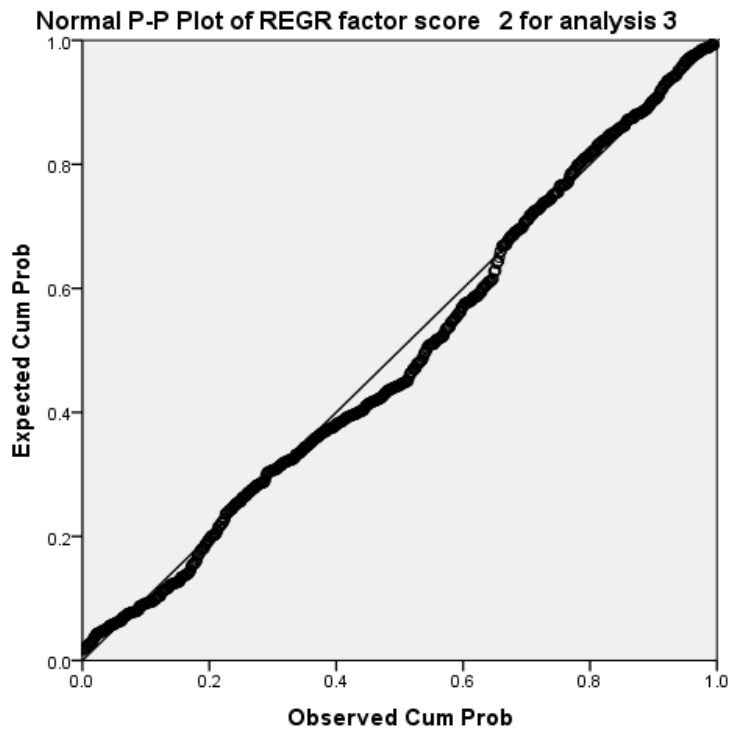
Performance Risk

Normal P-P Plot of REGR factor score 3 for analysis 3

Time Risk

Normal P-P Plot of REGR factor score 4 for analysis 3
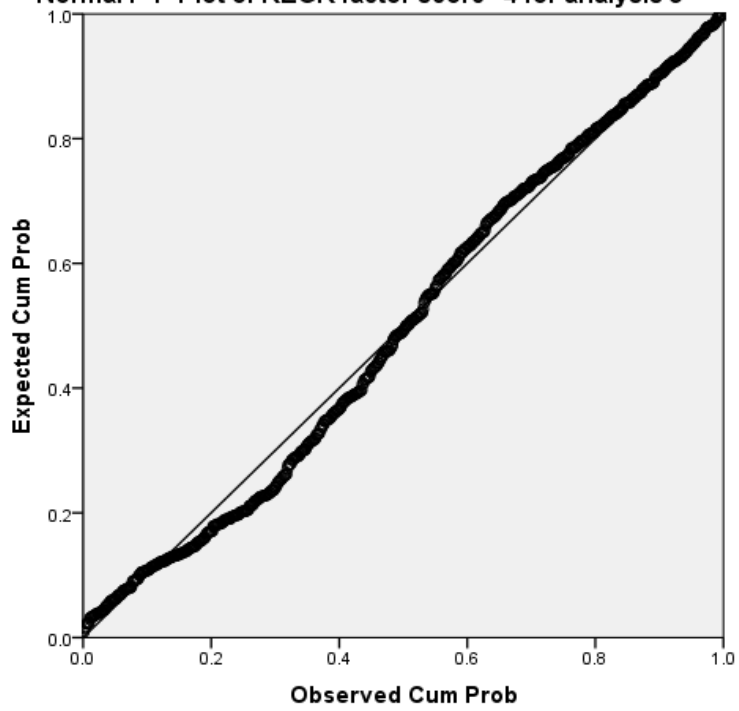
Psychological Risk
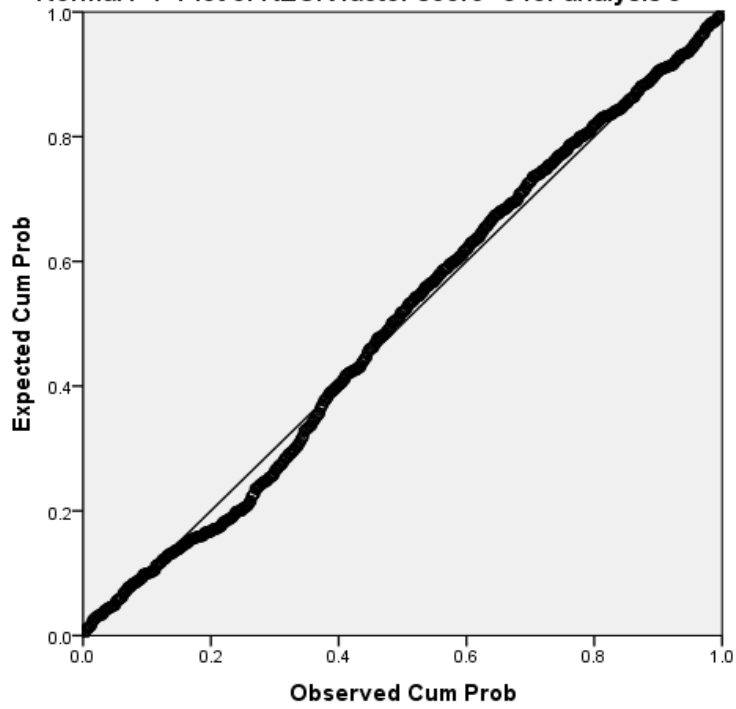
Normal P-P Plot of REGR factor score   5 for analysis 3
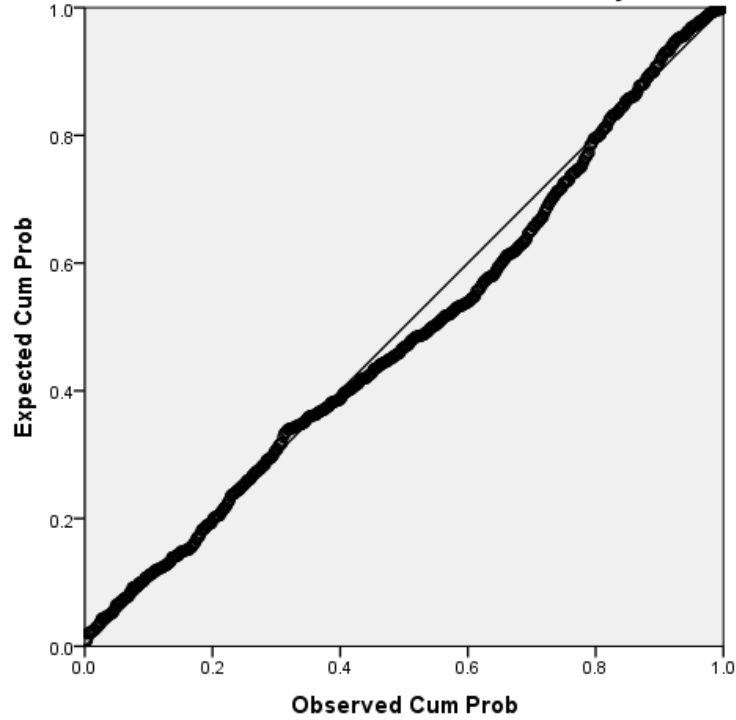
Privacy Risk

Normal P-P Plot of REGR factor score   6 for analysis 3
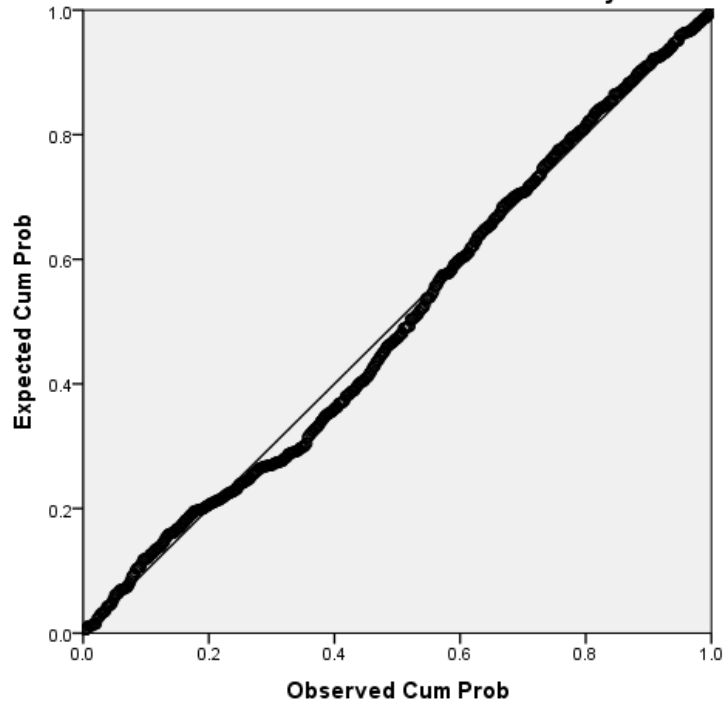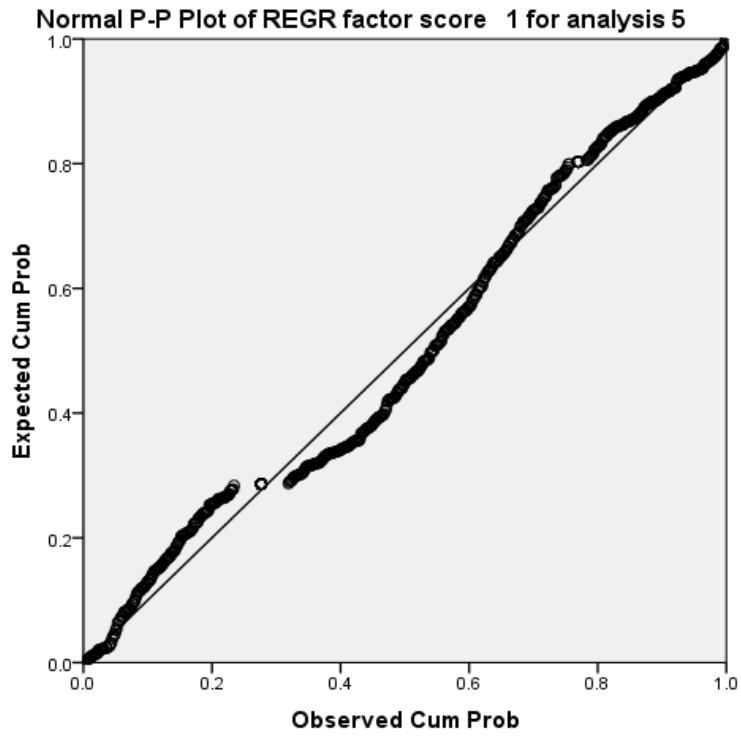
Social Risk

Normal P-P Plot of REGR factor score 1 for analysis 5

<u>Promotional Gratifications</u>

Normal P-P Plot of REGR factor score 2 for analysis 5

<u>Functional Gratifications</u>

Normal P-P Plot of REGR factor score   3 for analysis 5

Social Gratifications

Normal P-P Plot of REGR factor score   4 for analysis 5
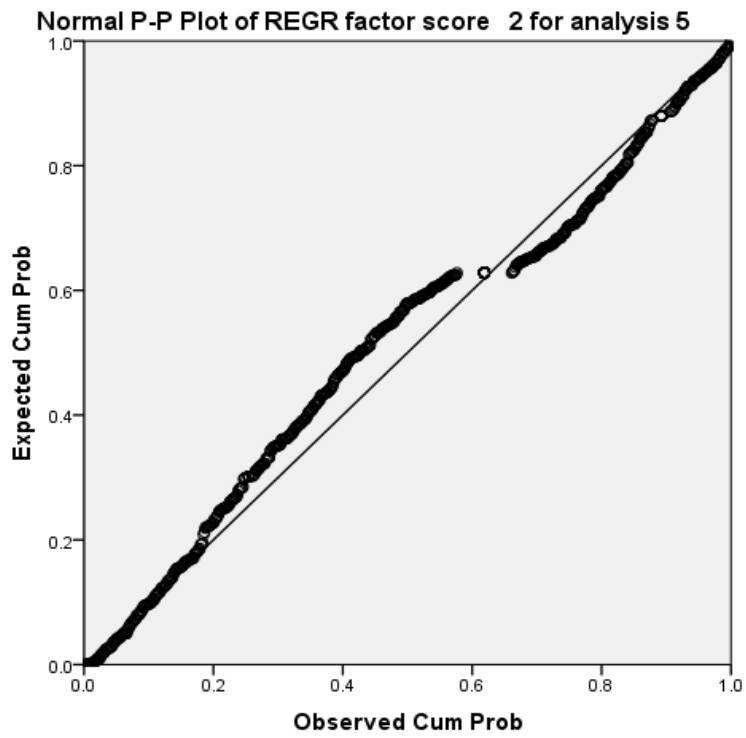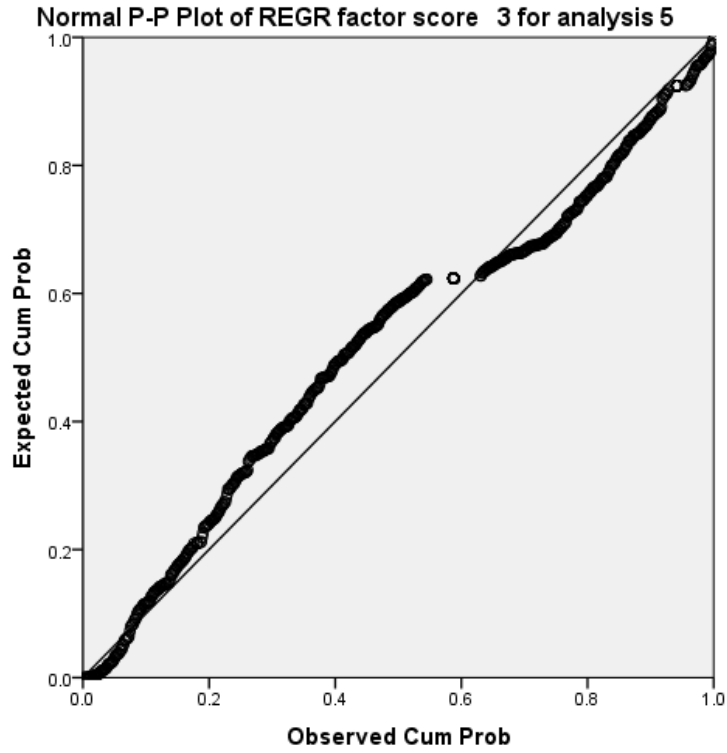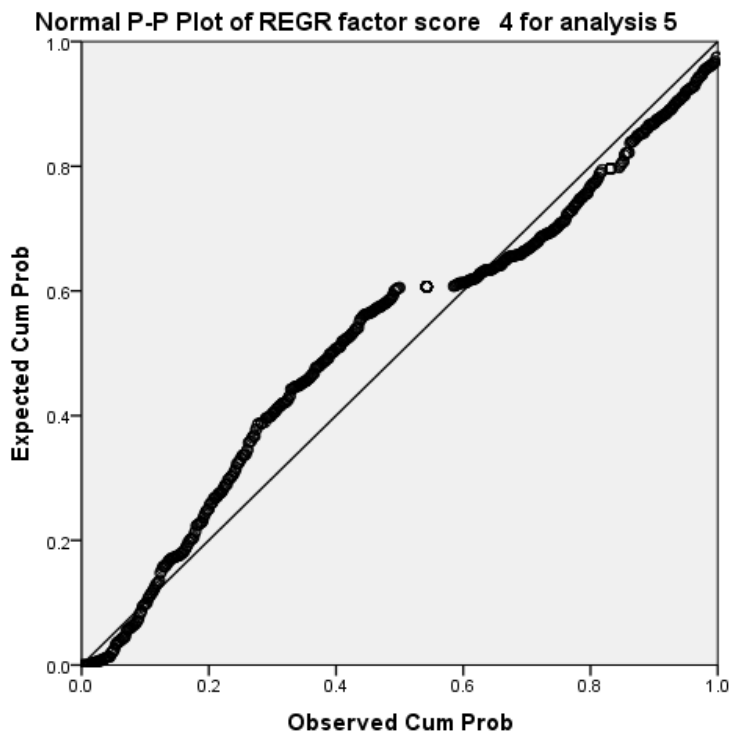
Entertainment Gratifications

This table examines the reliability of the variables by calculating Cronbach's alpha, inter item correlation and corrected item total correlation. Note that S.D. = standard deviation.

UTAUT CONSTRUCTS

PE = performance expectancy, EE = effort expectancy, SI= social influence, FC = facilitating conditions, BI = behavioural intention, BU = behaviour usage.

RISK PERCEPTION CONSTRUCTS

FR= financial risk, PR= performance risk, TR=time risk, PSYR= psychological risk, PRIR= privacy risk, SR=social risk.

USES & GRATIFICATIONS CONSTRUCTS

PG=promotional gratification, FG=functional gratification, SR=social gratification, EG=entertainment gratifications

Construct	Item	Statement	Mean	S.D	Cronbach's Alpha	Inter-item correlation	Corrected Item-Total Correlation
Performance Expectancy	PE1	Mobile App helps me to do things quickly	4.28	.748	0.78	0.43-0.54	.602
	PE2	Mobile App are convenient in acquiring information	4.20	.752			.617
	PE3	Mobile App increases my efficiency	3.99	.851			.585
	PE4	Mobile App enables me to complete my journey effectively without any hassle	4.03	.801			.572
Effort Expectancy	EE1	It's easy to use mobile app	4.15	.690	0.83	0.51-0.67	.608
	EE2	It's easy to learn how to use Mobile App	4.19	.679			.599
	EE3	My interactions with Mobile App are clear and understandable	4.17	.681			.581
	EE4	It's easy to understand the operation of Mobile App	4.19	.704			.468
Social Influence	SI1	People who influence my behaviour think that I should use Mobile App	3.37	.996	0.76	0.33-0.0.67	.608
	SI2	People who are important to me (such as family, peers, friends, etc.) think that I should use	3.44	1.033			.599
	SI3	People guide me to use Mobile App	3.12	1.142			.581
	SI4	I use Mobile App because many people are using them	2.68	1.249			.468
Facilitating Conditions	FC1	I have the necessary resources to use Mobile App	4.21	0.701	0.80	0.27-0.56	.666
	FC2	I have the necessary knowledge to use Mobile App	4.3	0.698			.622
	FC3	It is easy for me to get information on how to use Mobile App	4.21	0.72			.627
	FC4	It is easily compatible with other technologies I use	4.08	0.78			.629

	FC5	I can get help from others when I have difficulties using Mobile App	4	0.825			.409
Behaviour Intention	BI1	I intend to continue using Mobile App	4.24	.765	0.78	0.40-0.54	.576
	BI2	I will always try to use Mobile App	3.99	.894			.611
	BI3	I have used Mobile App in the past 4 weeks	4.31	.832			.594
	BI4	Overall, I use Mobile App a lot	4.09	.947			.604
Behaviour Usage	BU3	I use mobile app to read review/feedback	3.02	1.007	0.88	0.79-0.79	0.793
	BU4	I use mobile app to provide review/feedback	2.85	1.072			0.793
Financial Risk	FR1	I worry about monetary loss while using Mobile App	2.97	1.118	0.80	0.515-0.613	.633
	FR2	I worry about potential risks/fraud while using Mobile App	3.32	1.131			.690
	FR3	I worry I'll not get refunds from service provider	3.06	1.123			.614
Performance Risk	PR2	I worry about the substandard performance of mobile app than desktops	3.03	1.069	0.78	0.47-0.60	.606
	PR3	I worry the efficiency of Mobile App differ from what I expect	3.00	1.041			.693
	PR4	I worry that the Mobile App does not provide the level of benefits that I would be expect	2.84	1.055			.592
Time Risk	TR2	Mobile App run slow and lead to loss of time	2.58	1.057	0.715	0.42-0.48	.533
	TR3	Mobile App can lead to wastage of time	2.76	1.216			.558
	TR4	Mobile App will lead to waste of time due to payment errors	2.89	1.132			.516
	PSYR1	I feel uncomfortable while using Mobile App	2.21	1.087	0.799	0.49-0.68	.569

Psychological Risk	PSYR2	I feel anxious while using Mobile App	2.24	1.017			.703
	PSYR3	I feel nervous while using Mobile App	2	0.926			.671
Privacy Risk	PRIR1	I worry about my personal information using Mobile App	3.47	1.154	0.889	0.68-0.75	.758
	PRIR2	I worry that on using Mobile App my payment information may be stolen	3.37	1.170			.814
	PRIR3	I worry about using Mobile App because my signing account can be hacked	3.33	1.201			.775
Social Risk	SR2	My peers will hold me in high esteem, if I use Mobile App	2.48	1.002	0.804	0.54-0.611	.683
	SR3	My friends think I am showing off if I am using Mobile App	2.12	.938			.630
	SR4	Mobile App would provide me with a higher social status	2.33	1.097			.649
Promotional Gratification	PG1	It provides me with special offers from restaurants or hotels	3.94	.833	0.88	0.67-0.74	.765
	PG2	I could receive exclusive promotions	3.79	.922			.804
	PG3	4.4 It's helpful to get accurate information anywhere, anytime	3.75	.911			.747
Functional Gratification	FG1	It's helpful in reservations/bookings (airline ticket/hotel	4.13	.755	0.89	0.41-0.62	.597
	FG2	It's helpful to know the reviews of other travellers	4.25	.648			.701
	FG3	It's helpful to see photos of places visited by travellers	4.19	.685			.759
	FG4	It's helpful to access information faster than any other	4.18	.728			.682
	FG4	It's helpful to navigate the locations (restaurants/cafes/hotel)	4.06	.789			.652
	FG5	It's helpful to search nearby destinations based on	4.24	.675			.693

	FG6	It's helpful to get accurate information anywhere, anytime	4.21	.691			.678
	FG7	It's helpful in reservations/bookings (airline ticket/hotel	4.13	.755			.597
Social Gratification	SG1	It's helpful to see if others feel the same way about a service as I do	3.82	.784	0.83	0.41-0.69	.647
	SG2	It's helpful to compare my own evaluation with that of others	3.74	.822			.695
	SG3	It's helpful to share my views/reviews	3.82	.800			.639
	SG4	It's helpful to discuss about a product/service immediately with other travellers	3.91	.717			.660
	SG5	I feel good when I share my travelling experience with others	3.79	.836			.575
Entertainment Gratification	EG1	I enjoy using mobile app	3.92	0.803	0.89	0.54-0.72	.723
	EG2	It is entertaining	3.68	0.877			.750
	EG3	It's fun to use	3.77	0.877			.768
	EG4	It's exciting to use	3.68	0.875			.770
	EG5	It's entertaining to know about different places	3.98	0.781			.656

Construct	Item	Reference
Performance Expectancy	4 items	Venkatesh *et al.,* 2003 and Lai, 2013
Effort Expectancy	4 items	Venkatesh *et al.,* 2003 and Taylor *et al.,* 2013
Social Influence	4 items	Taylor *et al.,* 2013
Facilitating Conditions	5 items	Yu, 2011 and Taylor *et al.,* 2013
Behaviour Intention	4 items	Yu, 2011
Behaviour Usage	2 items	Taylor *et al.,* 2013
Financial Risk	3 items	Featherman and Pavlou, 2003
Performance Risk	4 items	Chen, 2013 and Akturan and Tezcan, 2012
Time Risk	3 items	Chen, 2013 and Akturan and Tezcan, 2012
Psychological Risk	3 items	Chen, 2013
Privacy Risk	3 items	Chen, 2013
Social Risk	3 items	Akturan and Tezcan, 2012

Factor	Risk Perception	Uses-and-Gratifications
Cluster 1 **(Worried Traveller)**	**High perception** of Privacy risk **Low perception** of Social risk and Financial risk	**High perception** of Functional gratification **Low perception** of Entertainment gratification
Cluster 2 **(Savvy Traveller)**	**High perception of** Performance risk **Low perception** of Financial risk and Psychological risk	**High perception** of Promotional gratification **Low perception** of Entertainment gratification
Cluster 3 **(Anxious Traveller)**	**High perception** on Financial risk and Performance risk	**High perception** of Social gratification **Low perception** on Promotion gratification
Cluster 4 **(Deal Seeker)**	**High perception** on Social risk and **Low perception** on Time risk and Privacy risk	**High perception** on Promotional gratification **Low perception** on Social gratification and Entertainment gratification

ANNEXURE-VII: PUBLICATIONS FROM THESIS

1. Chhonker, M. S., Verma, D., & Kar, A. K. (2017). Review of Technology Adoption Frameworks in Mobile Commerce. *Procedia Computer Science*, *122*, 888-895.

2. Chhonker, M. S., Verma, D., Kar, A. K., & Grover, P. (2018). m-commerce technology adoption: Thematic and Citation Analysis of Scholarly Research During (2008-2017). *The Bottom Line*, *31*(3/4), 208-233.

3. Chhonker, M.S., Verma, D., Kar, & Daultani, Y. (2018). *Typology based on Risk Perception and Uses & Gratifications: A study on travelers Using Mobile Apps in India*. Paper presented at 18Th Global Conference on Digitalization and Flexibility for Organizational Management and Transformation, Lucknow, India. **(Best Paper).**