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**CONCEPTUALIZING THE ROLE OF INNOVATION-ATTRIBUTES FOR
EXAMINING CONSUMER ADOPTION OF MOBILE INNOVATIONS**

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Abstract

Services across different consumer markets are being introduced as mobile phones applications for them to be usable on-the-go. *Mobile wallet* and *Mobile ticketing* are two such applications that have been recently introduced in the Indian context. For achieving an increased adoption rate of these innovations, it is important to understand the behaviour of the factors that help consumers form positive intentions about such innovations, in turn leading to the acceptance and use of those innovations. This paper, thus aims at developing a theory-based conceptual framework for examining the user adoption of mobile innovations using the innovation-attributes that have been shown in the recent literature to have considerable influences on the acceptance of innovations. Innovation-attributes from Rogers' *diffusion of innovations* theory, Tornatzky and Klein's *meta-analysis*, and Moore and Benbasat's *perceived characteristics of innovating* theory will be used in developing the conceptual framework for examining the adoption of mobile innovations.

Keywords Adoption, Conceptual framework, Innovation-attributes, Mobile wallet, Mobile ticketing, Indian context

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1. Introduction

On a broader level, it is through innovations that the countries hope to design and develop globally appealing new products and services, the sales of which may help minimize indebtedness and improve economies (Samli, 2012). Two recent mobile innovations in the Indian context are (a) the Interbank Mobile Payment Service, or the Immediate Payment Service (IMPS), which is a *mobile wallet* initiative of the *National Payments Corporation of India (NPCI)*, and (b) the IRCTC mobile ticketing application, which is the *mobile ticketing* initiative of the *Indian Railway Catering and Tourism Corporation Limited (IRCTC)*. While IMPS is a 24/7 interbank electronic fund transfer service, IRCTC mobile ticketing application is a secure mobile ticketing solution, both available on mobile platforms. The ability to access services ubiquitously (on-the-go) is considered the biggest advantage of using services/applications on mobile phones (Liang et al, 2007).

IMPS is available for customers to carry out financial transactions around the clock which comes with the accompaniment of time and cost savings. Being transferred over a safe-secure medium, the funds are made instantly available (within 15-30 seconds) for use by the recipient. The remitter can access their bank accounts on their mobile devices to initiate these fund transfers (NPCI, 2012). It allows both, *Person to Person* (fund transfers between two individuals), and *Person to Merchant* (fund transfers between a customer and a merchant) type of fund transfers. As of September 2013, the official NPCI webpage (npci.org.in) shows that there are currently 59 IMPS member banks and 52715100 MMIDs have been issued. An MMID is the *Mobile Money Identifier* issued to every remitter choosing to use this mobile application. As with the IRCTC mobile ticketing application, the modern day technology has introduced a new enhancement whereby the railway commuters can choose to make their railway bookings using this application on their mobile phones, on the go. The interested users are required to register with IRCTC and download this application on their GPRS activated mobile devices. The official IRCTC webpage shows that many mobile operators have partnered with IRCTC to become the active providers of this application. Even banks like ICICI are stepping up to become official partners of this service (IRCTC, 2013).

The current low adoption of the IMPS application in the Indian context has started to be picked upon and acknowledged; an article by *Business Standard* (2012) addresses the issue of its low adoption, and states that the industry analysts point at the fact of the IMPS application being fully of use to only smart phone users as the probable culprit. Not that this facility is not available to the basic phone users at all, only that there comes a limit on their transaction value for the customers accessing this application on basic phones. The IRCTC mobile ticketing application is also in its initial stages in the Indian consumer market. The application is being subjected to continuous changes and upgrades. The new changes have been introduced with a view of making this application also compatible with the CDMA phones.

As reported earlier, there are 59 already existing IMPS member banks list and more number of banks are expected to be added to this list. For the other banks to partner this application, the success of the existing member banks will be a considerably influential factor for their

adoption decision. These other banks may be more interested in finding out about the factors that will make the customers choose such a mobile wallet facility over the other existing fund transfer services. Similarly, when it comes to the IRCTC mobile ticketing, given the fact that Indian railways is the transportation system which provides commuters access to even the remote interiors of Indian towns/villages at reasonably priced tickets, the Indian railways has become the popular, preferred means of transport amongst the Indian citizens (Patel and Grover, 2010). The mobile ticketing application not only allows the commuters to make their bookings on the run, saving time, but is also available at zero additional cost, making it also cost efficient. During the inauguration of IMPS (Mumbai, Nov 2010), the deputy governor of the *Reserve Bank of India (RBI)* stated that – “the twin challenge for India is to succeed in reducing the use of cash, while encouraging the spread and use of mobile wallet to reap the full benefits of this ubiquitous product” (Kapoor et al., 2013). The statement emphasizes the importance behind achieving a higher adoption of applications such as IMPS and IRCTC’s mobile ticketing application which eliminate transactions involving paper money, in turn emphasizing the importance of studying the factors that may, or may not influence the adoption for these applications.

In the case of IMPS, there are no studies or officially recorded statistics available on the factors that most affect its adoption. The case is more or less the same with the IRCTC mobile ticketing. Upon further delving, it was found that the literature in these two contexts was considerably weak. Although numerous studies in the mobile payment and mobile commerce contexts (Barnes, 2002; Siau and Shen, 2003; Wu and Wang, 2005; Dahlberg et al., 2008) were found, none empirically investigating the mobile wallet, and mobile ticketing applications in the Indian context were found. Very few studies either briefly discussing the IRCTC mobile ticketing application, or merely mentioning its introduction in the mobile commerce context were found to present in the literature. Both IMPS and the IRCTC mobile ticketing applications are fairly new technologies in the Indian context, which can be the biggest reason behind the absence of empirical examinations of these two innovations in the existing literature. Therefore, there exists a need for undertaking empirical investigations on the factors that potentially promote or retard the adoption and diffusion of these technologies. The primary aim of this study is therefore to create a conceptual framework for examining the role of different innovation-attributes in the adoption of these two mobile applications in the Indian context.

As Earp and Ennett (1991) state, the conceptual models help summarize and integrate the acquired knowledge to define concepts, explain casual linkages, and generate the associated hypotheses, that is conceptualizing the literature based on the theoretical foundations (Lucarelli and Brorstrom, 2013). This paper thus proposes a conceptual model for studying the aforementioned innovations in an Indian context. Therefore, the paper begins with reviewing the literature on innovation-adoption models and the innovation-attributes used to examine different types of technological innovations, followed by the theoretical justifications behind the selection of those innovation-attributes to study these two mobile innovations, alongside the formulation of the relevant hypotheses for testing the proposed

conceptual models. This paper will then identify the implications and suggest directions on future research.

2. Extant Models for Examining Innovation-Adoption

The subject of innovation-adoption research is spread across sundry disciplines – anthropology, early and rural sociology, education, public health, medical sociology, communication, marketing, management, geography, and many others (Rogers, 2003). Today, the concept of innovations is gaining increased visibility due to the increasing levels of competition in the consumer markets. The success of these technological innovations can be measured only by examining and analyzing their acceptance by the target consumer markets. There are several theoretical models available in the literature, mostly developed from the psychology and sociology theories (Venkatesh et al., 2003; Venkatesh et al., 2012), such as - the Diffusion of Innovations theory [DOI] (Rogers, 1962), the Theory of Reasoned action [TRA] (Fishbein and Ajzen, 1975), the Theory of Planned Behavior [TPB] (Ajzen, 1985; Ajzen and Fishbein, 1980), the Technology Acceptance Model [TAM] (Davis, 1989), the decomposed Theory of Planned Behavior (Taylor and Todd, 1995), the extended Technology Acceptance Model (Venkatesh and Davis, 2000), and the Unified Theory of Acceptance and Use of Technology [UTAUT] (Venkatesh et al., 2003).

From these widely used, tested, and validated models available for examining the innovation-adoptions, one model that best suited the current study had to be selected. Rogers regarded the following five characteristics as the *perceived attributes of innovations* – relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). Rogers' diffusion of innovations theory is the very well established and most used theory in the field of innovations (Tornatzky and Klein, 1982; Greenhalgh et al., 2004; Legare et al., 2008; Hester and Scott, 2008, Kapoor et al., 2013). According to Dillon and Morris (1996), the *diffusion of innovations* theory is possibly the principal theoretical perspective on technology adoption at both individual and organizational levels, offering a conceptual framework for discussing adoption at a global level. Also, all of the above listed innovation-adoption models (TAM, TRA, TPB, UTAUT, and the other extended/modified variants of these models) used more or less the similar types of innovation-attributes. In addition, two other pieces of work are regarded with great importance when it comes to the attributes affecting intention and adoption of innovations – (a) 30 attributes (five of which were Rogers') identified in the *meta-analysis* by Tornatzky and Klein (1982), and (b) five attributes (two of which were Rogers') identified in the *perceived characteristics of innovating* theory by Moore and Benbasat (1991). After Rogers, Tornatzky and Klein's meta-analysis from 1982 was marked as a significant contribution in this literary field of innovation diffusion. They examined the IT innovations by discussing the use of Rogers' innovation-attributes in the IT world. In addition to the five attributes listed by Rogers, they identified twenty five other innovation-attributes. Since Tornatzky and Klein had picked these innovation-attributes from the publications in the field of innovations, it was clear that these attributes had marked their presence in the innovation literature, and had gained recognition as the attributes that influence the adoption of different innovations. Therefore, these other 25 attributes were

deemed important and relevant for this research work, and hence included to be studied under this review. In their work, Tornatzky and Klein (1982, p28) state that “innovation characteristics research describes the relationship between the attributes or characteristics of an innovation and the adoption or implementation”. Therefore, it is of importance to study these innovation attributes as they greatly influence an individual’s decision of adoption of any innovation. Tornatzky and Klein (1982) also provided a conceptual yardstick in their paper that essentially laid seven features of an *ideal innovation-attribute study*.

It would be noteworthy to mention at this point that there have been very few studies that have potentially dealt with reviewing the innovation-attributes related studies. After Tornatzky and Klein in 1982, Moore and Benbasat presented their work in this area in 1991, but they concentrated more on developing an instrument to measure individual perceptions of adopting an IT innovation. They discussed attributes both from the works of *Rogers* and *Tornatzky and Klein*. They studied eight attributes in total, five out of which were studied either by Rogers, or by Tornatzky and Klein. However, there were three other newly identified attributes – *Image*, *Voluntariness* and *Result Demonstrability*, all of which essentially formed their basis from Rogers’ attributes. In total, the study is looking at incorporating 33 innovation-attributes for their influences to be studied on the adoption, and adoption intention aspects of an innovation-adoption decision.

To confirm the usage of these 33 innovation-attributes in the recent literature, a literature search was carried out. All publications citing Rogers’ DOI theory were extracted via Google scholar and ISI web of knowledge from 1996 onwards. It was at first decided to retrieve all publications citing this theory after the release of Rogers’ last book in 2003. While doing so, we came across a considerable number of studies that preferred citing the 4th edition of his book even after the release of the 5th. Upon further enquiry we found that there were not many differences in these two editions of Rogers’ books, and hence the year post the release of his 4th edition was picked, which was 1996. Many screenings later, it was found that 19 of these 33 attributes were either no longer in use by the recent studies, or had been utilized by less than five publications, and were thus eliminated from being considered under this study. The 33 innovation-attributes, after careful considerations, were then narrowed down to only 14 innovation-attributes which were in active use in studies published on innovations since 1996; in addition to Rogers’ five attributes, the other nine attributes of relevance shortlisted here were – cost, risk, ease of use, image, visibility, voluntariness, result demonstrability, social approval, divisibility, and communicability.

3. Reviewing the Literature on Mobile Innovations

To function on mobile devices, both the IMPS, and the IRCTC mobile ticketing application applications consumes the 3G/4G data from users’ mobile network operators for activation of the internet for processing the initiated financial transactions. These applications, in a way integrate internet banking, mobile ticketing, and mobile payment. The existing literature in these areas is vast, for instance, internet banking (Brown et al. (2004; Shih and Fang, 2004; Jaruwachirathanakul and Fink, 2005; Yiu et al., 2007), mobile payments (Mallat, 2007; Chen, 2008), mobile banking (Koenig-Lewis et al., 2010), mobile ticketing (Mallat, 2008). The

literature houses very few studies briefly discussing/mentioning the IRCTC mobile ticketing application - a study on Indian railways vaguely mentions the possibility of the reservation services being made available on a mobile platform (Srivastava et al., 2007); a study on mobile commerce in the Indian market mentions this application (Singh and Yammiyar, 2008); another study reviews this application in a whole different context focussing no attention on its adoption/diffusion (Patel and Grover, 2010). These studies are evidences that account for the less/no of literature on the factors influencing the adoption of mobile wallet, particularly the adoption of the Interbank Mobile Payment Service, and mobile ticketing, particularly the IRCTC mobile ticketing application, both in the Indian context. This study, thus aims to study the significant determinants of adoption for these services.

4. Developing the Conceptual Framework and Associated Hypotheses

Both the innovations being examined under this study are of the *voluntary* kind, in that, the choice to whether or not to use these innovations is solely up to the individual consumers, or as Rogers (2003) puts it, these types of free willed adoption decisions of the consumers are referred to as the *optional innovations decisions*, whereby, the choice of adopting or rejecting an innovation are made by the individuals independent of the decisions of the other members in the system (Rogers, 2003). Rogers explains that it is the individual's perception of the innovation-attributes and not the attribute as classified objectively, that affects the adoption rate of an innovation. Technological innovation creates uncertainty about the consequences of its use in the minds of the potential adopters which is alleviated upon seeking answers to the questions like – what is the innovation, what are its consequences, advantages and disadvantages, how and why does it work?; all of which can be measured using the five perceived attributes of innovation (Rogers, 2003). With this study an additional nine attributes will be used to address the aforementioned concerns. All of the 14 attributes of interest to this study have been listed in table 1 alongside their definitions and sources for easy reference.

Table 1 The final 15 innovation-attributes, their definitions, and item sources

Innovation-Attributes	Definitions	Sources
Relative Advantage	Degree to which an innovation is perceived as better than the idea it supersedes	Rogers (2003)
Compatibility	Degree to which an innovation is perceived as consistent with existing values, past experiences and needs of potential adopters	Rogers (2003)
Complexity	Degree to which an innovation is perceived as relatively difficult to understand and use	Rogers (2003)
Trialability	Degree to which an innovation maybe experimented with on a limited basis	Rogers (2003)
Observability	Degree to which the results of an innovation are visible to others	Rogers (2003)
Cost	Relates to the costs associated with the use of an innovation. Lower costs increase the rate of innovation-adoption	Tornatzky and Klein (1982)
Risk	Multidimensional component involving performance, financial, social, physical, psychological, time loss, product breakdown	Tornatzky and Klein (1982)

	and the like types of risks	
Ease of use	Degree to which an individual believes that using a particular system would be free of physical and mental effort	Davis (1986); Moore and Benbasat (1991)
Image	Degree to which the use of an innovation is perceived to enhance one's image or status in one's social system	Tornatzky and Klein (1982)
Visibility	Degree to which the use of a particular innovation is apparent	Tornatzky and Klein (1982)
Voluntariness	Degree to which use of an innovation is perceived as being voluntary or of free will	Tornatzky and Klein (1982)
Result Demonstrability	Dimension concentrated on the tangibility of the results of using an innovation, including their observability and communicability	Moore and Benbasat (1991)
Social Approval	Nonfinancial aspect of reward	Tornatzky and Klein (1982)
Divisibility	Degree to which parts can be tried out separately and implemented separately	Tornatzky and Klein (1982)
Communicability	Degree to which an innovation can be clearly and easily understood	Tornatzky and Klein (1982)

Innovations that are perceived by the potential adopters as having higher – relative advantage, compatibility, trialability, observability, visibility, and communicability; lower – complexity, risk and cost associations; greater demonstrability of results, increased social approval and having the capability of acting as image enhancers will have a tendency of being adopted more quickly than the other innovations (Rogers, 2003; 1995; Teo and Pok, 2003; Tornatzky and Klein, 1982). Another point worth mentioning at this stage would be of the extensive similarity existing between two shortlisted innovation-attributes which are *complexity* and *ease of use*. Both these attributes are much evidently measuring the same thing, but in opposite directions. It would therefore, by logic, be appropriate to consider them together as a single attribute for this research. However, given that they have been identified differently in different theories, it was deemed more appropriate to treat them as two exclusive attributes in this research, hence the different sets of hypotheses for both attributes.

This section will now focus on proposing hypotheses for two voluntary innovations under consideration. As detailed earlier, while one is a mobile wallet initiative, the other is a mobile ticketing type of application. Since both applications involve customer interaction over a mobile interface, it was deemed appropriate to group them under a single head, *mobile innovations*, and propose similar hypotheses for both. Each of the 14 innovation-attributes will be exclusively discussed, and the associated hypotheses will be proposed.

4.1 RELATIVE ADVANTAGE FOR MOBILE INNOVATIONS

The feature most attractive about the opportunity of using different services/applications on a mobile phone is the advantage of accessing these services/applications at anytime from anywhere, ubiquitously (Liang et al., 2007). The same can be linked with the use of both, IMPS and the IRCTC mobile ticketing application which make the facility of transferring funds and booking railway tickets at any time of the day and week, available to its customers. The extent to which a technological innovation offers improvements over the currently available tools determines the relative advantage of that innovation (Dillon and Morris,

1996). This attribute has been studied across numerous mobile related technological innovations, for instance, the effect of relative advantage on adoption intentions of mobile internet (Gerpott, 2011; Hsu et al., 2007), mobile banking (Koenig-Lewis et al., 2010), mobile ticketing (Mallat et al., 2006; 2008), mobile payments (Schierz et al., 2010), and so on has been widely investigated.

With IMPS surpassing the ideas of carrying out financial transactions by stepping into physical banks, or via telebanking, or using the internet/e-banking, and with the IRCTC mobile ticketing being offered as an enhancement over the over-the-counter type and internet/e-ticketing of railway bookings, these two mobile innovations can be considered as those superseding the existing systems. The mobility feature allows the consumers to make fund transfers and railway bookings with a few taps on their mobile phone applications from anywhere, at any time, offering clear advantages of flexibility, physical convenience, time, and cost savings. Hence the effects of this attribute were deemed relevant to both the mobile innovations, and thus included, to be posited as –

H1a: *Relative advantage of IMPS will significantly influence the behavioral intentions of the potential consumers.*

H1b: *Relative advantage of the IRCTC mobile ticketing application will significantly influence the behavioral intentions of the potential consumers.*

4.2 COMPATIBILITY FOR MOBILE INNOVATIONS

The compatibility of a given innovation, as perceived by the members of a social system, is positively associated with its rate of adoption (Rogers, 2003). If a technological innovation is compatible with the needs of its potential users, then their uncertainty about that innovation decreases, fitting more closely with their situation, which then results in an increase in the adoption rate of the innovation (Rogers, 2003; Sahin, 2006). According to Rogers (2003), previous practices tend to set a standard against which an innovation is interpreted. Both, IMPS and the IRCTC mobile ticketing are essentially allowing the users to carry out the same financial and ticketing transactions as they did previously, offering them enhanced features in the present time to meet their future needs of efficiently pursuing these transactions. More specifically, using the fund transfer facility and making railway ticket bookings on mobile phones effectively meets the financial and ticketing needs of the consumers, alongside allowing them to perform these tasks on-the-go, which in effect is much quicker and efficient than the other existing alternatives for performing these transactions.

Being regarded as a significant predictor of use intentions by many – mobile network, mobile internet, mobile ticketing, mobile payments, mobile marketing and other mobile related innovation-studies (Chen, 2008; Hsu et al., 2007; Roach, 2009; Schierz et al., 2010; Shin, 2010; Mallat et al., 2008), it was decided to study the influence of compatibility on these two mobile innovations in the Indian context. In addition, mobile related studies were also found investigating the influence of compatibility on the perceived usefulness of an innovation, for instance, mobile payment services (Schierz et al., 2010), mobile commerce (Wu and Wang,

2005), mobile computing (Wu et al., 2007) and others. Taking perceived usefulness to be an equivalent of the relative advantage attribute (Moore and Benbasat, 1991; Wu and Wang, 2005), it was also decided to explore the effects of compatibility on the relative advantages of these two mobile innovations.

Interestingly, past studies have shown the associations of compatibility with the ease of use attribute; for instance, Koenig-Lewis et al (2010) in their study on mobile banking services cited Agarwal and Karahanna (1998) and Wu and Wang (2005) to state that previous research suggests that compatibility will lead to higher perceived ease of use as it involves less effort. They reported for a significant positive impact of compatibility on ease of using the mobile banking services. Other mobile adoption studies like Shin (2010), Wu and Wang (2005) and others have recorded positive influences of this attribute on ease of use. The hypotheses formulated in this regard thus were –

H2a: *Compatibility of IMPS will significantly influence the behavioral intentions of the potential consumers.*

H2b: *Compatibility of the IRCTC mobile ticketing application will significantly influence the behavioral intentions of the potential consumers.*

H3a: *Compatibility will significantly influence the relative advantage of IMPS.*

H3b: *Compatibility will significantly influence the relative advantage of the IRCTC mobile ticketing application.*

H4a: *Compatibility will significantly influence the ease of using IMPS.*

H4b: *Compatibility will significantly influence the ease of using the IRCTC mobile ticketing application.*

4.3 COMPLEXITY FOR MOBILE INNOVATIONS

The greater the ease involved in using an innovation, the higher the chances of it being quickly adopted (Davis, 1986; Rogers, 2003). As Matilla (2003) very rightly put it, the perceptions of complexity involved with undertaking financial transactions via mobile channels are more often than not, inversely related to the users' experiences with such technologies in general. Very evidently, both IMPS and IRCTC mobile ticketing involve financial transactions over mobile devices. Using these mobile applications may be perceived comparatively differently by different consumers on the complexity scale, based on varying skills and differing adaptability levels of the consumers.

Often mobile commerce related innovations study the influence of this attribute on behavioral intention, for instance, mobile multimedia services by Pagani (2004), mobile marketing studies by Roach (2009) and Tanakinjal et al (2010), mobile payment services by Chen (2008) and Schierz et al (2010), mobile banking services by Lee et al. (2003), mobile data services by Lu et al (2008), and others. As Bauer et al (2005) illustrate, the existing

knowledge of the users on the use of a technological innovation determines their ability to understand and use that innovation, in turn determining their perception of complexity related to the use of that innovation. Therefore, the more comfortable the users will be with operating mobile applications, the more familiar these users will be with browsing the mobile internet, and the more aware they are of the different functionalities on the mobile phones, the less complex the use of IMPS and IRCTC ticketing applications will appear to them. The hypotheses thus formulated are as follows

H5a: *Lower Complexity associated with the use of IMPS will significantly influence the behavioral intentions of the potential consumers.*

H5b: *Lower Complexity associated with the use of the IRCTC mobile ticketing application will significantly influence the behavioral intentions of the potential consumers.*

4.4 TRIALABILITY FOR MOBILE INNOVATIONS

As facts have it, the more an innovation can be tried, the faster it is accepted by the target consumer mass (Sahin, 2006). The opportunity of getting to try an innovation before making a final adoption decision makes it more attractive to the consumers. Evidences of mobile innovations related studies investigating the effect of this attribute on the behavioral intentions of the consumers can be found in the literature, for instance, mobile internet studies by Hsu et al (2007) and Gerpott (2011), mobile banking study by Mattila (2003) and others. Given that the consumers can at any time opt to download, install and try both the IMPS and IRCTC mobile ticketing applications, the aspect of trialability was explored in these two contexts with the following hypotheses in place –

H6a: *Trialability of IMPS will significantly influence the behavioral intentions of the potential consumers.*

H6b: *Trialability of the IRCTC mobile ticketing application will significantly influence the behavioral intentions of the potential consumers.*

4.5 OBSERVABILITY FOR MOBILE INNOVATIONS

When the benefits of using an innovation become visible to the intended adopters, it increases the likelihood of that innovation being accepted more quickly (Greenhalgh et al., 2004). As Mattila (2003) aptly explain in their mobile banking study, in the particular cases of service products, the lack of a physical domain may cause some problems when it comes to the visibility aspect; however, the mobile phones in such cases, which effectively are the service delivery mediums, do serve in enhancing the physical evidences of such mobile related technological innovations. With IMPS and IRCTC mobile ticketing, both being services offered over mobile phones, it should be interesting to explore how the observability of these innovations impacts their acceptance in the Indian context. With the existing literature housing studies with findings on the effects of observability as an innovation attribute on the consumers user intentions in the mobile related contexts (Cruz et al., 2010; Leung and Wei,

1999; Matilla, 2003; Putzer and Park, 2010; Vishwanath and Goldhaber, 2003), the hypotheses formulated from the IMPS and IRCTC ticketing perspectives were –

H7a: *Observability of IMPS will significantly influence the behavioral intentions of the potential consumers.*

H7b: *Observability of the IRCTC mobile ticketing application will significantly influence the behavioral intentions of the potential consumers.*

4.6 COST FOR MOBILE INNOVATIONS

According to Plouffe et al. (2001), the consumers are always faced with certain costs in switching from one product/service to another in different markets (Chen and Hitt, 2002). In the context of mobile payments, transaction costs associated with a mobile payment is often added to the price of the purchased item, in this case, the purchased railway ticket (IRCTC), or the undertaken money transfer (IMPS). In opting to use the IMPS and IRCTC mobile ticketing applications, although small, there are charges associated with transactions over both of these mobile applications. More specifically, the consumers choosing to make payments using IMPS bear a small surcharge per transaction; and the consumers also bear a small charge while booking railway tickets over the IRCTC application.

In addition to these charges, both the mobile application consume data to access the internet from the 3G/4G network providers, and as IRCTC (2013) claims, these providers may charge the customers differently depending upon their data costs. Same is the case with IMPS, data consumption to use the internet, and hence the mobile application, comes with a nominal charge in the mobile bills. Use of Wi-Fi to run these two applications also has a small cost association, only here, the charge is added to the monthly internet bills and not the mobile bills. Another indirect cost association that can be made here is with the compatible mobile phones/smart phones that the consumers have to own to be capable of using these applications.

Researching the past publications led us to find that numerous studies on mobile payment paid curious attention towards the element of cost. The past studies found that any form of additional cost such as any hidden cost, or premium pricing, or a higher transaction fee and the like, tend to negatively influence the behavioral intentions of the potential adopters, which in effect raises barriers to the adoption of such mobile commerce applications (Dahlberg et al., 2007; Hung et al., 2004; Mallat, 2007; Wu and Wang, 2005;). It was therefore concluded that it would be appropriate to investigate the influence of cost on the adoption of these two mobile applications under consideration. Since studies investigating the effect of cost on both behavioral intention (Luarn and Lin, 2005; Wu and Wang, 2005) and adoption (Dahlberg et al., 2007; Mallat, 2007; Tornatzky and Klein, 1982) were found, the hypotheses formulated for this attribute were –

H8a: *Lower cost associations to the use of IMPS will positively influence the behavioral intentions of the potential consumers.*

H8b: *Lower cost associations to the use of the IRCTC mobile ticketing application will positively influence the behavioral intentions of the potential consumers.*

H9a: *Lower cost associations to the use of IMPS will positively influence its adoption by the potential consumers.*

H9b: *Lower cost associations to the use of the IRCTC mobile ticketing application will positively influence its adoption by the potential consumers.*

4.7 RISK FOR MOBILE INNOVATIONS

While IMPS allows customers to transfer money, IRCTC allows customers to book tickets upon payment using credit/debit cards. Essentially, both these mobile applications involve carrying out financial transactions. It is no secret that consumers are overly cautious and inherently bear some apprehensions when it comes to choosing to monetarily transact, or in other words, feed their bank account/card details onto such mobile phone applications, making the element of risk evident here. These types of security and privacy related issues are often perceived as risks by the potential users, thereby significantly impacting their intentions to use a certain innovation in question (Mallat et al., 2008; Tanakinjal et al., 2010). A mobile banking study, for instance, evaluated eight different dimensions of risks (performance, financial, time, social, psychological, physical, privacy, and overall risks) for their effects on the use intentions of the target consumers (Luo et al., 2010).

Furthermore, in reiterating that in accessing these mobile applications, the customers are first required to access the internet on their mobiles via the 3G/4G connections provided by the customers' respective mobile phone network providers/operators, it should be noted here that depending on the network providers – the mobile internet connections can be slow, or of poor quality at certain times, the mobile application may still be carrying some outdated content, or may have a missing or broken link or error that may all prevent the customers from completing a successful transaction, which are all effectively perceived as risks associated to the use of such mobile applications (Wu and Wang, 2005). Consumers also tend to perceive errors in transactions caused by their own mistake in using the application, and the device and mobile network reliability as potential risks in using mobile applications (Mallat, 2007). In using applications on mobile devices, issues of mobile device breakdown, connection and network coverage, weak phone battery, loss or theft of mobile devices are all strongly perceived by the users as the risks capable of aborting incomplete financial transactions, making such options less attractive to the potential consumers (Mallat et al., 2008) which negatively influences their adoption (Hansen, 2006). The hypotheses formulated for this attribute therefore were –

H10a: *Lower risk associations to the use of IMPS will positively influence the behavioral intentions of the consumers.*

H10b: *Lower risk associations to the use of the IRCTC mobile ticketing application will positively influence the behavioral intentions of the consumers.*

H11a: *Lower risk associations to the use of IMPS will positively influence its adoption by the potential consumers.*

H11b: *Lower risk associations to the use of the IRCTC mobile ticketing application will positively influence its adoption by the potential consumers.*

4.8 EASE OF USE FOR MOBILE INNOVATIONS

As Davis (1989) suggests ease of use is an individual user's assessment of the extent to which the interaction with a given system is free of mental effort. The ease of using applications on mobile phones can be basically seen as being dependent on two aspects – one, how easy the design and interface of the application is for convenient navigation, reflecting its *user friendliness*; and two, how comfortable the user is with the handling and usage of mobile phones, more typically, how competent the user is when it comes to using and exploring different applications on a mobile phone, reflecting the users' tech-savviness. With an aim to explore these two sides of this innovation-attribute, the relevant hypotheses will be formulated. In terms of use of this innovation-attribute in the recent literature, studies on mobile internet (Hsu et al., 2007), wireless mobile data services (Lu et al., 2008), mobile ticketing service (Mallat et al., 2008), and mobile virtual network (Shin, 2010) have all supported for a significant effect of this attribute on the behavioral intentions of the potential users.

It should be noteworthy to reiterate here the point mentioned in section 3.2, that the *ease of use* attribute from the TAM model is the same thing being measured in an exact opposite direction as that of the *complexity* attribute from the DOI theory (Chen et al., 2002; Moore and Benbasat, 1991; Wu and Wang, 2005). Similarly, the *perceived usefulness* attribute from the TAM model is regarded equivalent to the *relative advantage* attribute from the DOI theory (Moore and Benbasat, 1991; Wu and Wang, 2005). The literature houses numerous evidences of mobile commerce related studies investigating the influence of *perceived ease of use* on the *relative advantage*, for instance – mobile multimedia services (Pagani, 2004), mobile payment services (Schierz et al., 2010; Venkatesh et al., 2003), mobile commerce (Wu and Wang, 2005), mobile data services (Lu et al., 2005) and many others. Therefore, in order to learn about the effects of this attribute on the behavioral intentions of the targeted consumers, and the relative advantages of IMPS and the IRCTC mobile ticketing service, this attribute was posited as –

H12a: *Ease of using IMPS will positively influence the behavioral intentions of the consumers.*

H12b: *Ease of using the IRCTC mobile ticketing application will positively influence the behavioral intentions of the consumers.*

H13a: *Ease of use will significantly influence the relative advantage of IMPS.*

H13b: *Ease of use will significantly influence the relative advantage of the IRCTC mobile ticketing application.*

4.9 IMAGE FOR MOBILE INNOVATIONS

This attribute measures an individual's perception of the impact of use on their personal image. As image inherently is a social element, any decision in favor of enhancing one's social image will always appear appealing from the consumer perspective. In an internet banking adoption study the consumers were found more likely to become adopters, if doing so improvised their image (Gounaris and Koritos, 2008). Hsu et al. (2007) in their mobile internet adoption study showed positive associations between image and adoption intention. Kleijnen et al. (2005) also supported for the significant effect of image on adoption intentions in the service innovation-adoption context. De Marez et al (2007) on the other hand found in their study that the late adopters did not perceive mobile televisions useful for uplifting their image/prestige. Therefore this innovation-attribute was posited as follows –

H14a: *Better image associations with the use of IMPS will significantly influence the behavioral intentions of the consumers.*

H14b: *Better image associations with the use of the IRCTC mobile ticketing application will significantly influence the behavioral intentions of the consumers.*

4.10 VISIBILITY FOR MOBILE INNOVATIONS

As discussed earlier in this chapter (section 3.2) past studies have made associations between the observability and visibility attributes. While some studies regard both attributes as equivalent, the others separate aspects of result demonstrability and visibility, and consider the two aspects to be emerging from the observability attribute (Moore and Benbasat, 1991; De Marez et al., 2007). While the visibility of a mobile as a device is quite apparent in a social setting, the use of different applications on these mobile devices may necessarily not be that apparent. In simpler words, a user using a mobile device is always visible, but what the user does on a mobile phone is not always visible to an observer/outsider in a social setting. Placing considerations in the fact that both IMPS and IRCTC mobile ticketing are applications on mobile phones, the visibility of their usage becomes an interesting subject of study. Past studies, like those on mobile marketing (De Marez et al., 2007), mobile internet (Hsu et al., 2007), mobile telephony (Ho and Lee, 2011), and others show that increased visibility significantly affects the users' intentions to adopt these mobile innovations. The formulated hypotheses in this regard therefore were –

H15a: *Visibility of IMPS will positively influence the behavioral intentions of the potential consumers.*

H15b: *Visibility of the IRCTC mobile ticketing application will positively influence the behavioral intentions of the potential consumers.*

4.10 VOLUNTARINESS FOR MOBILE INNOVATIONS

Voluntariness was incorporated to study the degree to which these mobile innovations were being perceived as voluntary. Internet banking and mobile internet studies have witnessed the

voluntariness attributing to be positively impacting the users' adoption intentions and innovation-adoption decisions (Gounaris and Koritos, 2008; Hsu et al, 2007). This attribute has also been has received much attention in the IT context, where usage and adoption of most innovations was found not to be necessarily voluntary (Karahanna et al., 1999; Kishore and McLean, 2007). While Hsu et al. (2007) reported for the voluntariness to adopt mobile internet to be significantly affecting its potential users' adoption intentions, Slyke et al. (2002) reported a non-significant relationship between voluntariness and users' adoption intentions for using groupware. As mentioned earlier in this chapter under section 3.2, although the two innovations IMPS and IRCTC mobile ticketing applications in themselves by their very nature are voluntary, some individual users may feel that the use of these new technologies is expected from them by the people surrounding them. The hypotheses thus proposed for this attribute were –

H16a: *Voluntariness of IMPS will significantly influence the behavioral intentions of the potential consumers.*

H16b: *Voluntariness of the IRCTC mobile ticketing application will significantly influence the behavioral intentions of the potential consumers.*

4.11 RESULT DEMONSTRABILITY FOR MOBILE INNOVATIONS

In measuring the tangibility of the outcomes of using a given innovation, this attribute was seen behaving differently across different fields. Where some mobile-innovations related studies were seen reporting no significant impact of this attribute on the adoption intention, studies from other fields were seen reporting differently - Akturan and Tezcan (2010) in a study on the adoption of mobile banking recorded a non-significant impact of result demonstrability on adoption intentions; the mobile internet adoption study by Hsu et al. (2007) also captured a non-significant influence of this attribute on use intentions. On the other hand, there were also studies like the e-commerce adoption study by Slyke et al. (2010), and the virtual banking adoption study (Liao et al., 1999) that found result demonstrability to be positively influencing adoption intention. Being originally derived from the observability attribute and being a co-companion of the visibility attribute, result demonstrability can be clearly seen as being considerably influenced by these two attributes. Recalling discussions from section 3.4.1.9 above, mobile applications may be potential targets of low visibility, and probably hence the non-significance of result demonstrability reported by the mobile-related studies. However, the behavior reported for this attribute by the other studies can't be ignored either. By logic, a better demonstrability of the results of using an innovation should attract more number of consumers. Therefore, to test the behavior of this attribute in the context of the two mobile innovations being examined by this study, the following hypotheses were laid out –

H17a: *Result demonstrability of IMPS will significantly influence the behavioral intentions of the potential consumers.*

H17b: *Result demonstrability of the IRCTC mobile ticketing application will significantly influence the behavioral intentions of the potential consumers.*

4.12 SOCIAL APPROVAL FOR MOBILE INNOVATIONS

Lopez-Nicolas (2008) in their study on mobile services acceptance, described social approval as the degree to which the individuals believed that the people around them thought that they should use the new mobile services. The same very well applies in this context. This research aims at examining as to what extent do the people in a social setting influence others to adopt the IMPS and IRCTC mobile ticketing application? As Hong and Tam (2006) suggest in their study on adoption of mobile data services, the adoption and use of a given innovation can be significantly influenced by friends and colleagues in a social environment. Lu et al (2008) in studying the adoption of wireless mobile data services, put forth that mobile users often find themselves in social situations, and that mobile phones these days are more recognized as fashion accessory than a mere communication device that in turn influences one's social status. All the above arguments suggest that mobile related innovations are more vulnerable to social influences. Many past studies on mobile related innovation adoptions have recorded a significant influence of social approval on the behavioral intentions of the potential users, for instance – mobile data services adoption-study by Lu et al. (2008), mobile ticketing adoption-study by Mallat et al. (2008), mobile virtual network adoption-study by Shin (2010). Given that IMPS and IRCTC mobile ticketing application are new services that have been made available to the public very recently, the potential users may prefer gathering inputs on the use of these services before forming any intentions towards its use. The hypotheses for this attributes thus formed were -

H18a: *Social approval of IMPS will significantly influence the behavioral intentions of the potential consumers.*

H18b: *Social approval of the IRCTC mobile ticketing application will significantly influence the behavioral intentions of the potential consumers.*

4.13 COMMUNICABILITY FOR MOBILE INNOVATIONS

Kleijnen et al. (2003) back then identified communicability to be an attribute that would turn out to be a more prevailing factor as the mobile technology would further integrate and develop into a more social setting. Communicability is effectively the degree to which the qualities of an innovative technology can be introduced to its potential adopters. As Dimitriadis and Papista (2010) highlight, a favourable word of mouth positively influences consumers towards innovation adoption. A study on mobile internet acceptance showed communicability significantly affecting its acceptance (Gerpott, 2011). Studies on mobile gaming (Kleijnen et al., 2003; Kleijnen et al., 2004) and mobile marketing (De Marez et al., 2007) have also reported similar significant influences of this attribute on adoption. In order to examine how effectively the users of IMPS and IRCTC mobile applications are capable of communicating the positives and negatives of these two applications, the following hypotheses were formulated –

H19a: *Communicability of IMPS will significantly influence its adoption by the potential consumers.*

H19b: *Communicability of the IRCTC mobile ticketing application will significantly influence its adoption by the potential consumers.*

4.14 BEHAVIORAL INTENTION FOR MOBILE INNOVATIONS

Behavioral intention, use intention, or intention to use is one of the most frequently used attributes in the innovation related studies. As defined by Ajzen and Fishbein (1980), behavioral intention measures the likelihood of an individual being involved in a given behavior. The behavior of an individual, that is, their decision to accept or reject a technological innovation, is determined by their intention to perform that behavior, that is, their intention to use that technological innovation (Fishbein and Ajzen, 1975). Having been studied as an independent variable determining the actual use of an innovation in numerous mobile related innovation-studies, for instance, mobile services (Bouwman et al., 2007), mobile payment (Dahlberg et al., 2003), mobile internet (Kurnia et al., 2006), mobile banking (Matilla, 2003), mobile commerce (Wu and Wang, 2005), and others, it was deemed apt to study the effects of behavioral intention on the actual use of both, IMPS and IRCTC mobile ticketing application. The hypotheses formulated in this regard thus were –

H20a: *Behavioral intention will have a significant influence on the adoption of IMPS.*

H20b: *Behavioral intention will have a significant influence on the adoption of the IRCTC mobile ticketing application.*

In summary, it was thus hypothesized that higher degree of - relative advantage, compatibility, trialability, observability, and ease of use, increased levels of – image, visibility, voluntariness, result demonstrability, and social approval, and lower degree of - complexity, costs and risks will significantly impact the users’ *behavioural intentions towards use* of IMPS and IRCTC mobile ticketing applications. In addition, higher compatibility, trialability, and ease of use were expected to have a significant impact on the *relative advantage* of these two applications. Also, greater compatibility was expected to significantly influence the *ease of using* them. Finally, lower cost and risks, and higher communicability and use intentions, were postulated to have a significant effect on the *adoption* of the two applications in the Indian context (Figure 1). The proposed hypotheses for this innovation have been summarized in table 2.

Table 2 Proposed Hypotheses for IMPS Adoption in the Indian Context

Hypotheses Numbers	Independent Variables	Dependent Variables
H1a,b	Relative Advantage	Behavioral Intention
H2a,b	Compatibility	Behavioral Intention
H3a,b	Compatibility	Relative Advantage
H4a,b	Compatibility	Ease of Use
H5a,b	Complexity	Behavioral Intention
H6a,b	Trialability	Behavioral Intention
H7a,b	Observability	Behavioral Intention

H8a,b	Cost	Behavioral Intention
H9a,b	Cost	Adoption
H10a,b	Risk	Behavioral Intention
H11a,b	Risk	Adoption
H12a,b	Ease of Use	Behavioral Intention
H13a,b	Ease of Use	Relative Advantage
H14a,b	Image	Behavioral Intention
H15a,b	Visibility	Behavioral Intention
H16a,b	Voluntariness	Behavioral Intention
H17a,b	Result Demonstrability	Behavioral Intention
H18a,b	Social Approval	Behavioral Intention
H19a,b	Communicability	Adoption
H20a,b	Behavioral Intention	Adoption

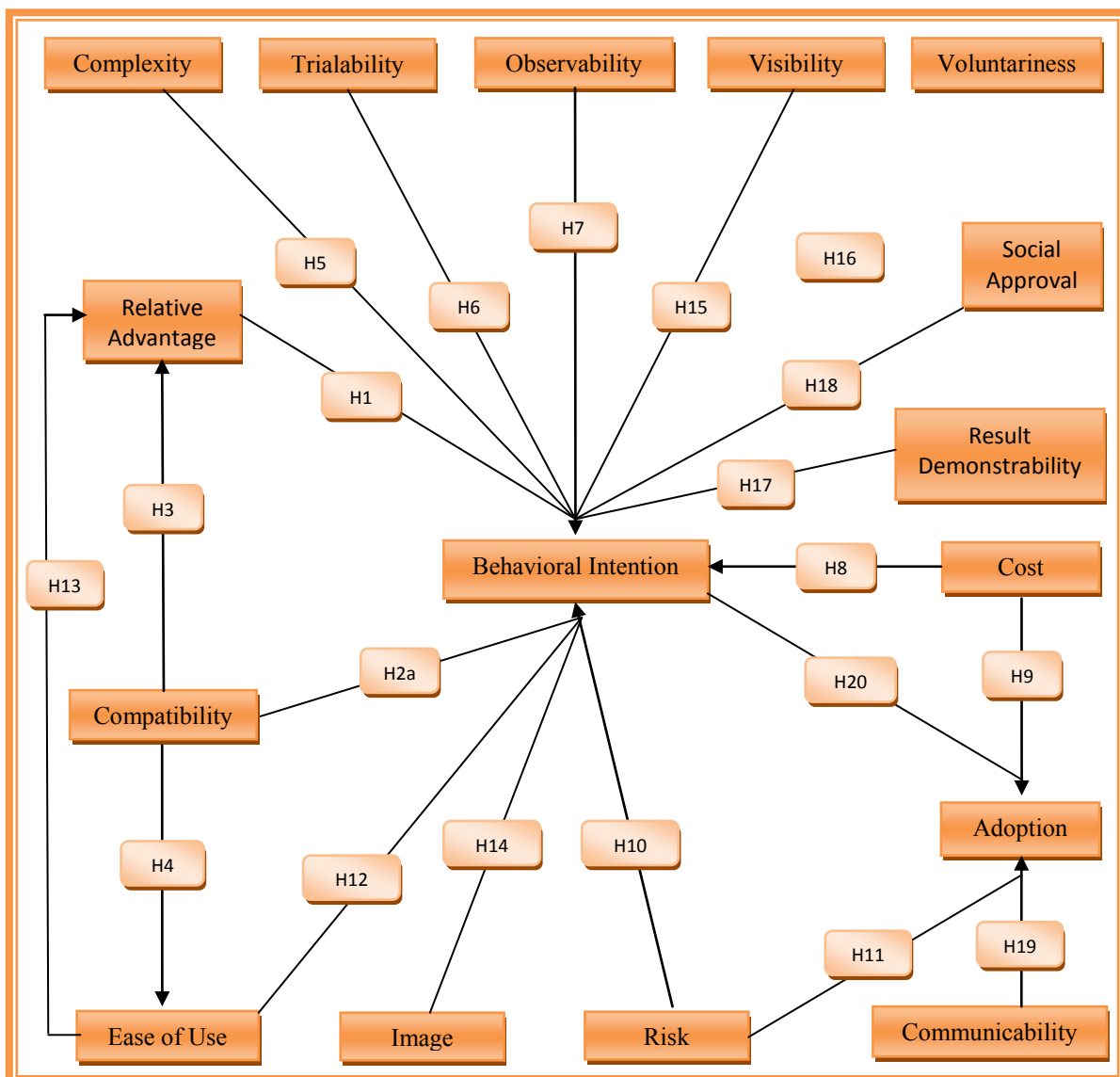


Figure 1 Proposed Conceptual Model for Mobile Innovations

5. Research Implications

This paper is an attempt to build on the present understanding of the existing relationships between various innovation-attributes (independent variables) on the behavioural intention and adoption (dependent variables) of mobile innovations. The conceptual framework proposed in this paper, instead of using one of the many already existing models (section 2) essentially integrates research from three distinct and recognized pieces of work in the field of innovation-diffusion, which are Rogers' diffusion of innovations theory, Tornatzky and Klein's meta-analysis, and Moore and Benbasat's perceived characteristics of innovating theory. The proposed framework is directed bringing to the fore light the few important aspects of mobile innovation adoption and how they can be of use for both the academicians and implementers/mangers of mobile innovations. The researchers in this area can use this framework to undertake empirical examinations for various mobile innovations.

From the academic perspective, we propose evaluate the behaviour of these attributes not just only on the *adoption* aspect, or the *intention* aspect, but based on the past evidences, we propose to study the influence of these innovation-attributes on both adoption, intention, and other possible relationships that were found to be validated by the past studies; like the effect of compatibility on relative advantage and ease of use, and of ease of use on the relative advantage. As pointed out earlier, the absence of literature on the acceptance of the mobile wallet and mobile ticketing applications in the Indian context make the proposed conceptual framework in this study all the more enriching from the future research perspectives for these technologies. Proposing an examination of the influences of 14 noteworthy innovation-attributes on the use intentions, adoption, relative advantage, and ease of using the mobile applications, this conceptual model serves as a potential foundation/base that the future researchers could use to build upon by empirically investigating these factors for the adoption of mobile applications. With the growing concept of ubiquitous services, the concepts of mobile wallet, paperless transactions, and the minimization of staff at physical offices/desks, the mobile applications such as IMPS and the IRCTC mobile ticketing application need to be promoted in a manner that attracts wider adoption. In doing so, a sound understanding of the factors that steer their diffusion and actual adoption becomes critical; which is exactly what this study attempts to offer to the practitioners of this technology - a solution, although partial, in the form of a conceptual model that defines relationships to be empirically examined to determine the strongest adoption factors impacting the adoption of these mobile innovations.

In terms of practical implications, the managers and implementers of mobile innovations can consider banking on the following insights that were extracted whilst reviewing the influences of the 14 shortlisted innovation-attributes reported by the past studies. When it comes to ease of use, studies tend to suggest that the real influence of this attribute can be examined only when the direction in which it is being measured are clearly marked, for instance, an e-government study suggests for future studies to clearly demarcate ease of use, along the desired line of ease in gathering information from the e-government bodies, or ease in completing a transaction using e-government, and so on (Carter and Belanger, 2004).

Another study on e-reverse auction suggests that ease of use can be enhanced by some compatibility related factors, which in turn may impact use intention (Gumussoy and Calisir, 2009). The most commonly proposed implication in reference to this attribute is that an easy to use innovation, and cultivation of an environment that fosters this are critical to favourably influence adoption rates of different innovations (Chau, 1996).

Most mobile commerce studies were found using image as an innovation-attribute that significantly impacted the adoption of mobile commerce related technologies (Allen, 2003; Teo and Pok, 2003; Hsu et al., 2007). According to Rogers (2003), diffusion has a special character owing to the newness of the idea in the message content, because of which a certain degree of uncertainty and *perceived risk* is present in the diffusion process. According to Moore and Benbasat (1991), the actual cost price of an innovation is a primary attribute, but the perception of the *associated cost* is a secondary attribute, in that, what might seem expensive to one consumer may seem inexpensive to another depending on their relative levels of income. This leads them to conclude that cost has the greatest influence on the buying behavior (Moore and Benbasat, 1991). In evaluation of cost as an innovation-attribute, studies were often found suggesting for economic resource allocations, that were assumed to leverage increased sales, and reduced cost associations to an innovation always attracted more consumers (Zhu et al., 2006; Damanpour and Scheider, 2009; Shin, 2010). Another worthwhile suggestion in the lead was that the cost associations to an innovation should be lesser than or equal to the systems it is superseding (Vrechopoulos et al., 2001). Riskiness was again, more often than not, recommended to be broken down into specific desired risk aspects to be evaluated, and not to be measured and relied upon as a general risk component, for instance, breaking down the risk component into evaluating the security and privacy risks in particular (Tanakinjal et al., 2010). The most common apprehension of many mobile users transacting over applications on a mobile platform is that of misuse of their personal information associated, which is accounted for as a risk that acts as a barrier to the adoption of those mobile innovations. A mobile payment study, as solution to this suggests regulations whereby the companies should be prohibited from collecting excessive information collection, to further control the opportunistic behaviours of such companies to ease the privacy concerns of the mobile phone users (Chen, 2008). Incorporation of certified and reputed technologies for security were also suggested to put the consumers' privacy and security risk concerns to rest by many studies (Lee-Partridge and Ho, 2003, Heimonen, 2012). Visibility found to be an attribute essential for targeting the late majority type of consumers, wherein observing the use an innovation influenced them for adoption (Hsu et al., 2007; Occhiocupo, 2011). Advertising the benefits of using that innovation to increase its visibility was also reported as an efficient tactic for attracting more consumers (Slyke et al., 2005). Whilst voluntariness was assumed to function through the compliance processes (Karahanna et al., 1999), positivity about an innovation from social groups and indirect social pressures were found to be significantly influencing adoption intentions (Lee-Partridge and Ho, 2003; Bernstein and Singh, 2008).

All of these above summarized influences in the mobile innovations context can be effectively tested only by empirically examining the proposed conceptual framework in this

study. To further add, it is not hidden that when it comes to banking and making railway bookings, people already have the other well established options that are already very comfortable with. For instance, when it comes to banking, there are the primitive systems such as the physical banks, telebanking, and internet banking options which allow the consumers to easily carry out their transactions. Similarly with making railway bookings, people have the options of booking their tickets at a manned ticket counter, or use the internet to make an e-booking. When it comes to using these services on a mobile platform, it definitely introduces elements of ease in terms of carrying out the required transaction at one's own convenience at any time, from anywhere, also saving one the trouble to reach a designated place (like a bank, or booking office) to complete their transactions. However, to derail the customers from their comfort track, and tempt them to use this new application, these mobile innovations will have to invest efforts in offering added privileges with their services on the mobile platform to win the consumers to use their mobile applications. Basically IMPS and the IRCTC mobile ticketing applications will have to offer even superior services/advantages to ensure maximum adoption. In doing so, to determine what factors in such an application are most appealing, or of no interest to the consumers need to be understood which can all be examined by empirically testing the conceptual model proposed in this study. Reiterating how the research and practice on the mobile ticketing applications in the Indian context is still in its beginning years, and the opportunities in terms of research, business processes, and consumer behaviour are enormous, today, the testing and validation of the conceptual model proposed in this paper for investigating the IMPS and IRCTC mobile ticketing adoption, sets in motion the theory and research on a couple of important and progressive technologies of today's world.

6. Conclusions

The framework presented in this paper attempts to provide the researchers on mobile innovations, and the mobile innovation planners with an organized and theoretically sound medium of empirically examining the adoption of different mobile innovations (mobile wallet and mobile ticketing) to gain a constructive understanding of what leads the customers to adopt these mobile innovations. This framework is not limited to the mobile wallet and mobile ticketing innovations, and can be easily fit to study any mobile innovation. This conceptual framework is the first step in designing a sound methodology that the researchers and the stakeholders of mobile innovations can employ to assist them with building a plan that attracts maximum number of consumers towards the use of mobile innovations. Much of the work remains undone for this study in terms of empirical examinations. The authors plan to apply this framework to a relevant respondent group to evaluate and further build on the usefulness of the proposed framework.

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