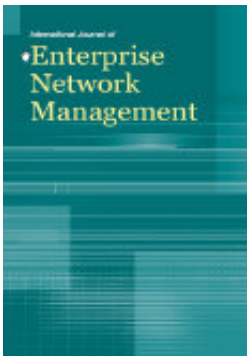

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Mobile wallet app engagement and word of mouth recommendation: an exploration of antecedents

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Mobile wallet app engagement and word of mouth recommendation: an exploration of antecedents

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Abstract: The main aim of this study is to identify the factors influencing the mobile wallet app engagement (MWAE) and examine those factors for segmenting users into different clusters. The researchers also wanted to determine if MWAE leads to word of mouth (WOM) recommendation. Previous research indicates that customisation, knowledge, relative advantage and compatibility could be possible antecedents of MWAE. Further, the mediating effects of trust and mobile wallet app usage in the relationship between MWAE and WOM recommendation were also examined. The findings of this study revealed that compatibility and the relative advantage positively influences MWAE. The result supported a sequential mediation model between MEAE, and WOM recommendation through the mediators trust and mobile wallet app usage. Customisation and knowledge do not moderate the relationship between compatibility and MWAE and relative advantage and MWAE. The entire users were segmented into three clusters based on the factors influencing the MWAE. The findings show that all the factors significantly differ across all three segments. Cluster 2 respondents significantly influence the MWAE that further leads to the WOM recommendations. Theoretical and practical implications are discussed. Future research directions and limitations have been suggested.

Keywords: mobile wallet app engagement; MWAE; diffusion of innovation theory; word of mouth recommendation; WOM; structural equation modelling; cluster analysis.

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1 Introduction

The advancement in personal communication emerged as a result of revolution in communication technologies. Mobile phone, smartphone devices, and mobile applications have become an essential part of the consumers' day-to-day routine (Kim et al., 2013). Mobile payment applications are one of the fastest and most accessible options for completing the transactions, and it is forecasted to have a high potential in the forthcoming years. Studies have found that users prefer mobile wallet apps rather than mobile web browsers, which is now a sign of awareness among users (Joseph et al., 2018). There is an increment of usages of smartphones and their applications like wearables apart from the smartphone mobile wallet payment services (Kranthi and Ahmed, 2018). Mobile devices are equipped with more computing powers. Smartphone apps like mobile wallet payment apps no longer depend upon the aged and simple wireless application protocol technologies. The computing power and its applications are enough for surfing the net and conducting the payment through a mobile wallet app using mobile versions of the desktop-based net browsers (Lai et al., 2010). Mobile computing includes devices and technologies such as LAN, tablet PCA, notebooks, smartphones, and cell. Any electronic device that can support and manage our work is called mobile computing. Mobile computing aims to permit the programs and users to be as efficient as possible in an unstable connectivity environment by not making any differences in which they function. Mobile computing is a rapidly growing core technology as it enables users in remote access locations to receive and transfer data from one fixed area to the remote areas (Perumal et al., 2015). This proves to be the solution to the main problem of mobility that further leads to increased penetration of mobile wallet payment services, and may enhance mobile wallet engagement leading to word-of-mouth recommendations.

Statistics also highlight that 70% of the users' total digital minutes are spent on smartphones, an increment of 28% since 2011 (Kim et al., 2013). Smartphone applications (apps) are the software that are downloadable onto mobile devices. Such apps display the brand identity with the help of the app name and the appearance of the brand icon, logo throughout the consumer experiences (Bellman et al., 2011). These apps give a platform to the consumer to shop, access information, and keep updated with their social network all the time (Alnawas and Aburub, 2016). Bellman et al. (2011) also

studied and found that mobile applications provide an effective means for high consumer engagement. The existing base of mobile subscribers in India is expected to touch approximately 1 billion by the end of the year 2020. Mobile wallet companies currently have a user base of 130 to 140 million in India, representing close to 61% of the total smartphone users. This number is 7 times larger than debit or credit card users in India. However, mobile transactions only constitute 1% of the transactions in terms of revenue. This indicates that consumers are using mobile wallet payment services for their smallest transactions. Previous literature suggests that engaged consumers show trust towards mobile wallets that in turn encourages the usage of mobile wallets. Hence, it is our endeavour to find out what are the factors that predict mobile wallet engagement. Further, are there any moderators between the predictors and mobile wallet app engagement (MWAE)? What are the outcomes of MWAE in the adoption process?

1.1 Impact of COVID-19 pandemic: mobile wallet

COVID-19 pandemic has severely affected many countries and India in particular. According to Tang et al. (2020) and the report from the world health organisation COVID-19 is a transmission risk by the direct contact with an infected person and an indirect contact with the surfaces in an immediate environment and with objects. COVID-19's continued increases have been one of the major problem currently faced by the financial markets and world economy. The massive effect of the COVID-19 pandemic comes from crucial sectors of the Indian economy, like automotive, manufacturing, hospitality, airline, and retail. It also impacted fast-growing digital payment, which is linked to the sectors mentioned above. Closing shops, trips, and less user spending like movies, entertainment, and outdoor foods negatively influence digital payment like mobile wallet payment services and its engagement towards it, apart from that the cross border payments like business to business and business to consumers reduced because of the temporary closures that further leads to the unlimited travel restrictions. Global lending is influenced and decreased.

The negative impact is undermining various sectors of the Indian economy in the context of the airline, hospitality, and airfares are vulnerable. The digital offline and online transactions operated by the leading and prominent firms are influenced by the set limits for ending the pandemic, i.e., COVID-19 outbreaks. While the consumer traffic is relatively high, the payment prices have decreased dramatically. If this kind of trend continues for a more extended period, business in the mobile wallet payment services sector will tremendously influence the next three to four months as consumers will be more aware of the outrages. The uncertain times in which we currently live when the influence of the COVID-19 has gone on socially and economically can temporarily influence the purchase patterns with others. On the positive side, lockdown and work from home has propelled the use of digital technologies such as mobile wallets for completing transactions by an increased number of consumers.

1.2 MWAE: overview

Engagement is described as the 'emotional involvement', 'connection', and 'attachment' a consumer may have with a product or brand (London et al., 2007). Kahn (1990) was the first to use the engagement concept (Saks, 2006; Vivek et al., 2012). Engagement is defined as the state of occupied, involved, retained, or interested in something (Pagani

and Mirabello, 2011). Engagement is the state which is characterised by involvement, energy, and efficacy (Maslach et al., 2001) and it is conceptually defined as the behavioural flow without any mind-set, i.e., control, curiosity, focus, and intrinsic interest (Chapman et al., 1999). Engagement is not a specific state or momentary state, but it is more about the pervasive, affective and cognitive state (Schaufeli et al., 2002). In both individual and organisational levels, there is a strong connection between profitability and engagement through sales, customer satisfaction, productivity, and employee retention (Harter et al., 2002). MWAE is defined as the user's motivation to engage in activities using their smartphones. Mobile engagement occurs when a user interacts with their smartphone devices to satisfy their needs, wants, and demands (Kowatsch and Maass, 2010; O'Brien and Toms, 2010). These needs states may be cognitively motivation driven. The ability to deliver satisfying experiences affects the value of engaging in the activities.

1.3 Diffusion of innovation theory

Diffusion of innovation theory (DIT) is one of the important social and psychological theory to understand more deeply about the rapid changes in the field of information technology. It also helps to achieve a good explanatory power (Hardgrave et al., 2003; Lee et al., 2011; Legris et al., 2003) to predict how people make decisions to accept innovations by understanding their pattern and structure (Rogers, 1995; Rogers and Shoemaker, 1983). DIT consists of five innovations features that act as an antecedent to the acceptance of new innovations:

1 relative advantage

2 complexity

3 compatibility

4 observability

5 trialability (Rogers, 1995).

DIT has more specific features of an innovation, which is beneficial to explain why the user accepts innovation. It also helps to know how he/she makes consumer decisions when they are accepting the innovations (Rogers, 1995). Rogers diffusion is a social process that allows people to share their experiences about the acceptance of innovations. Acceptance of innovation cannot be understood without consideration of the social system (Rogers, 2002). We have considered the only relative advantage and compatibility in our study owing to their relevance in the acceptance and usage of mobile wallets.

1.3.1 Relative advantage

Relative advantages defined as the degree to which innovative products or services under consideration provides better benefits than the predecessors (Rogers and Shoemaker, 1983). Generally, people accept innovation when they believed that it will help their increase effectiveness and efficiency (Lin and Chen, 2012). Generally, consumer evaluation of the mobile wallet app and its relative advantage is possible when it is compared to previous payment and transaction technologies.

1.3.2 Compatibility

Compatibility is defined as the degree to which service is perceived as consistent with the existing values, habits, and beliefs of the users and their previous and present experiences (Rogers, 1995). Compatibility plays a significant role in how the previous experiences affect the adopted technologies.

1.4 Rationale behind for using diffusion of innovation theory

Rogers and Shoemaker (1983) provides the conceptual basis for finding out the factors that aid MWAE. This theory is helpful to find out the complex pattern for the adoption of new technology. The innovative consumer is earlier in adopting a new product, ideas, and methods than other members of the social system (Rogers and Shoemaker, 1983), and it is essential to understand the innovative consumer's engagement process. This theory is also helpful to understand why some innovations are accepted at a faster rate while others are not accepted. Another reason is that DIT supports the perception that a user's beliefs play a vital role in deciding to accept or reject innovation (Agarwal and Prasad, 1999). The three characteristics of innovation, i.e., relative advantage, compatibility, and complexity have a strong influence on the adoption of innovation whereas observability and trialability showed an inconsistent finding on the adoption of new product innovations. In this study, we have not included the complexity factor from DIT. Most of the studies found that technical complexity acts as a barrier to the adoption of the mobile wallet app. Complexity in use, technology dessign and technology infrastructure are considered as barriers to new technology adoption (Vrechopoulos et al., 2003). Users will not opt to use mobile wallet payment mode if they find that it demands more time for consuming, mental effort, and frustration. So complexity has a negative impact on the adoption of the mobile wallet. So in this study, we are first interested in studying the effects of relative advantage and compatibility

2 Literature review: hypotheses development

The thriving economies of any country depend upon the financial positions. The financial institution like bank plays a crucial role for developing the economy and their financial markets. For economic progress, a robust banking system and online payment like mobile wallet payment services are required. The banks provide various functions like providing the credit card, debit cards, and other payment options. Likewise, in alignment with the banking services, mobile wallet payment services also provide services like scanning the code, completing the transactions, direct money transfer, etc. by using mobile wallet payment services (Kiruthika et al., 2012). The extant literature was reviewed based on Webster and Watson's (2002) approach in order to find out the research gap. Each research article was reviewed based on the study region, using the constructs, theory applied, data analysis techniques used, the methodology adopted, directions for future study and the context of the study. The operational definition of each and every construct used in this study is represented in Table 1.

Table 1 Operational definitions

No.	*Constructs*	*Operational definition*
1	Compatibility	A consumer will adopt and engage in a mobile wallet app if it is compatible and aligned as per their needs and requirements.
2	Relative advantage	A consumer will adopt and engage in the mobile wallet if it is superior in terms of the ideas and innovation, which is further helpful to replace it with new ones.
3	Customisation	A consumer will adopt and engage in the mobile wallet if it gives the consumer to the memorable, delightful lifetime experiences as per requirements and needs.
4	Knowledge	A consumer will adopt and engage in the mobile wallet based on his/her knowledge possession, prior experiences, and at the same time factors provide a platform that motivates the consumers towards adopting the mobile wallet app.
5	Mobile wallet app engagement	A consumer will be called an engaged consumer if they like to do the transactions in that particular app and spend a longer period of time.
6	Trust towards the mobile wallet	A consumer will adopt and engage in the mobile wallet if he/she is having trust and belief in the wallet company in which consumers are using for doing their transactions.
7	Mobile wallet app usage	If the consumer is satisfied by using the wallet services, then it will help to increase the mobile wallet app usage, which in turn leads to engaging the consumers towards the mobile wallet app.
8	Word of mouth (WOM)	WOM is defined as the consumer spreading the experiences that he/she got during the time of using the mobile wallet app that further leads to engage in the apps.

Aydin and Burnaz (2016) study and understand the factor contributing to consumer attitude development toward the intention to use mobile wallet payment services. The theoretical background adopted for the study is the technology acceptance model. The total sample size was 1,305, and the study region is Turkey, and the sample respondents were students and working professionals. The study's finding highlights the importance of perceived ease of use and perceived usefulness in attitude development. Perceived security was found to be a more negligible effect on a user's intention and attitude. The authors suggest that there is a need to apply the other theories and models in the contribution of the understanding of the attitude of the consumers towards the mobile wallet payment services. Another study done by Alaeddin et al. (2018) found that perceived ease of use and perceived usefulness are influential factors for switching the consumers towards the adoption of mobile wallet payment services, and the relationship between intention and attitude is significant. The theoretical background adopted in the study is TAM. The study region was Malaysia, with a sample size of 98, and the sample characteristics were business school staff. The authors indicate that there is a need to identify more variables that could enhance the perceived usefulness and perceived ease of use to influence attitude to switch from the leather wallet to mobile wallet payment services. Madan and Yadav (2016) found that facilitating conditions, performance expectancy, social influence, perceived values, perceived trust, and perceived regularity support positively impact mobile wallet behavioural intentions. The theory used is UTAUT, UTAUT2. The study region was India, and the target respondents are students, i.e., undergraduate and postgraduate. Suggestions for future studies indicate that there is a

need for some more factors must be included for investigating the influence of behavioural intention on mobile wallet payment services. Shaw (2015) studies found that perceived usefulness is the most crucial factor in personal innovativeness and, at the same time, perceived security as a significant predictor. Perceived usefulness is the most important factor, and on the other hand, perceived security and personal innovativeness act as essential predictors. The theory used is the technology acceptance model. The study region was the USA, and the target respondents are Smartphone users. The suggestions for future studies connotes the need to add other demographic profiles like age, gender, income, experiences, usages, educations, occupation, marital status, etc.

Shaw (2014) found that perceived usefulness is an essential factor, and at the same time, informal learning acts as a moderator mediated by trust. The theory used in the study is the technology acceptance model. The study region is Canada, and the target respondents are the students. The future study suggestions denotes a need to test the theory with the other segments of the population where the areas are unbanked and alternative infrastructure support to the mobile wallet payment services. Slade et al.'s (2015) study found that performance expectance is the strongest predictor across the entire model. The theory used in the study is UTAUT2. The study region is UK, with the sample respondents being students. They suggest that there is a need for including other factors for analysing the effect on the intention to use the near field communication mobile wallet payment services.

2.1 Compatibility and MWAE

Compatibility is defined as the degree to which newly adopted technologies must be aligned with the user's experiences and needs (Zolkepli and Kamarulzaman, 2015). The degree of compatibility is associated with the levels of customisation and personalisation. Some mobile wallet brands provide customised and personalised technology that is aligned with the technology based on the location's awareness (Yun et al., 2013). By using the global positing system (GPS) in the mobile wallet apps, it is easy for the marketers to reach the consumers on a more personal level. Another way marketers can use user information is to leverage the compatibility with the help of push notification in a personalised manner. Consumers are engaged with the mobile wallet apps that have personalisation and customisation features like push notifications, keyword search, and location-based data (Kim et al., 2013). Fang et al. (2017) found that if the mobile app is highly compatible, then it leads to high consumer engagement psychologically. The consumers are engaged highly with mobile wallet apps when the app content matches precisely with their preferences and needs. Based on the above findings, we can say that the perceived compatibility is positively related to the MWAE.

Therefore the following hypothesis is proposed.

Hypothesis 1 Compatibility has a positive influence on MWAE.

2.2 Relative advantage and MWAE

Relative advantage is defined as the degree to which technology is assumed to be superior in terms of ideas that will further help to replace (Rogers, 1995). When consumers see that newly accepted technology has a relative advantage over existing ones it will lead to the favourable perception, and at the same time, it leads to increased

engagement towards the mobile wallet apps. This preposition underlines the reasons as to why previous studies on product innovations validate the positive effect of the relative advantage on the acceptance of an innovative product that further leads to enhanced engagement (Shivers-Blackwell and Charles, 2006; Ramayah and Lo, 2007; Hong et al., 2008). The new innovative product's relative advantage over the available products might be helpful to the users to embrace fun, enjoyment, frolic, hedonism, and practical traits. Thus the following hypothesis is proposed.

Hypothesis 2 Relative advantage has a positive influence on the MWAE.

2.3 MWAE and trust towards using mobile wallet app

In the case of a mobile wallet, there are a few empirical studies that investigate the relationship between trust and other mobile wallet constructs. Duane et al. (2014) studied and found that trust is an important determinant that affects the willingness of the consumers to use mobile wallet payment services. Trust acts as an essential factor for the success of virtual payment like mobile wallet payment that lacks social cues and contacts, unlike in the physical environment (Gefen et al., 2003). The presence of trust decreases the environmental and behavioural uncertainties which are associated with the virtual payment like mobile wallet payment (Pavlou, 2003). In the virtual payment platform, trust is defined as the degree to which technologies are reliable dependable (Mcknight et al., 2002). Higher the perception of a user's that their information will be well-taken care in a dependable, credible, and ethical manner the higher will be an intention to accept the mobile wallet payment services, the higher the consumers will be free to share their information. The recent studies also found that engaged consumers are likely to show the characteristics in the form of relationship quality signals like satisfaction, trust, commitment, and loyalty towards the particular mobile wallet brand (Hollebeek, 2011; Brodie et al., 2013; So et al., 2014). The study also found that when companies engage the consumers, it results in interactions that are generally helpful to enhance the trusts. Therefore the following hypothesis is proposed.

Hypothesis 3 MWAE has a positive influence on the trust of mobile wallet apps.

2.4 Trust towards mobile wallet app and mobile wallet app usage

In an online platform, trust is defined as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that another party" (Mayer et al., 1995). Trust is generally conceptualised as the subjective beliefs in which online service providers will obligate secure online transactions (Kim et al., 2008). The security of online transactions has an essential role in establishing trust in any online or app platform like mobile wallet payment services. When the user is completing transactions by using the mobile wallet payment services, she perceives that using this mobile wallet app payment platform offers the users required security and measures that protect the users financial and personal information. The users must trust that their transactions with mobile wallet companies will be safe and secure (Al-Dwairi et al., 2018).

Consumers are unlikely to do mobile wallet payment transactions if they have do not have trust in mobile apps that aid transactions (Kim et al., 2011). In the case of a mobile wallet, there are a few empirical studies that investigate the relationship between trust and other mobile wallet constructs. Trust plays an important role to reduce uncertainty during the time of using the mobile wallet app (Morgan and Hunt, 1994). The trust of the customer plays a vital role, especially in the online platform like mobile wallet apps (Reichheld and Schefter, 2000; Connolly and Bannister, 2007). Zhou (2014) studied and found that consumer trust towards the mobile wallet payment services has an important effect on the mobile wallet app usage. Anderson and Weitz (1989) studied and found that there is a link between the mobile wallet app usage intentions or the customer's usages towards the mobile wallet payment services.

Therefore the following hypothesis is proposed.

Hypothesis 4 Trust towards a mobile wallet app has a positive influence on the mobile wallet app usage.

2.5 Mobile wallet app usage and WOM

WOM occurs when the consumer is impressed or satisfied with the mobile wallet payment services brands spread the words about the positive and good delightful memorable lifetime experiences with their friends, colleagues, relatives either offline or online platform. When the consumer shares their experiences about doing the transactions which are done on the mobile wallet payment platform via WOM is helps the company to facilitate the decision-making process to the other consumers and reduce the behaviour of the consumer about the negative thoughts towards using the mobile wallet payment services.

Therefore, the following hypothesis is proposed.

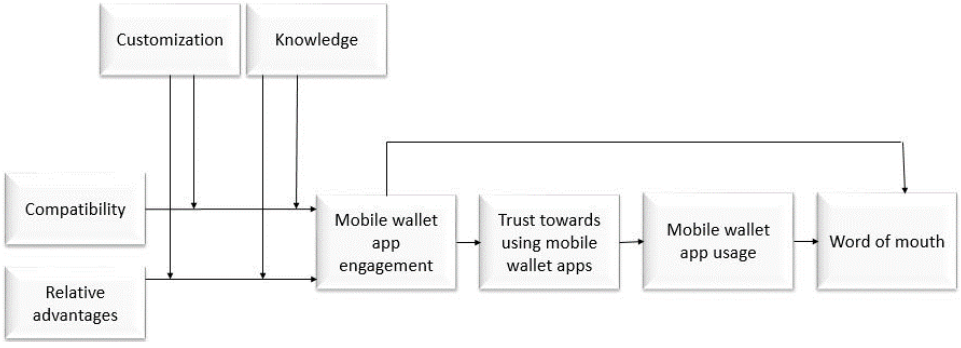
Hypothesis 5 Mobile wallet app usage has a positive influence on the WOM towards mobile wallet apps.

2.6 Mobile wallet engagement and WOM

WOM is an important and powerful tool for promoting any mobile wallet brands (Bone, 1995; Feick et al., 1986). The WOM will be favourable when it contains attributes like pleasant, novel experience, vivid, recommend to others (Anderson, 1998). De Matos and Rossi (2008) and Brown et al. (2005) found that committed, loyal and satisfied customers are the effective facilitators of WOM. De Matos and Rossi (2008) found that loyal and committed customers act as brand advocates for brands such as Apple, Kindle, and amazon.com are providing powerful advocacy for the respective brands. In the same way, when customers are highly engaged with a particular mobile wallet app; then they are more likely to spread positive WOM to others by using the different channels and will play as an advocate for a particular mobile wallet brand. Therefore the following hypothesis is proposed.

Hypothesis 6 MWAE has a positive influence on the WOM towards a mobile wallet app.

Figure 1 Conceptual framework



2.7 MWAE, trust towards mobile wallet app, mobile wallet app usage, WOM: sequential mediation

Mobile wallet engagement is defined as the engagement in which consumers spend a lot of time doing the transactions using a mobile wallet app and engage in mobile wallet transactions. If the consumers are satisfied with the app's performance can smoothly complete their transactions without any interruption, then this develops trust that leads to increase mobile wallet app usage, which further leads to positive WOM. Generally, mobile wallet app usage and trust mediate the relationship between the MWAE and WOM. As per Fishbein and Ajzen's (1975) theory, the usage and trust act as mediators in the relationship between the beliefs. In this case trust acts as a mediator in the relationship between the MWAE and usage leading to WOM. Therefore the following hypothesis has been proposed.

Hypothesis 7 The positive relationship between mobile wallet engagement and word of the mouth is sequentially mediated through trust and mobile wallet app usage towards the mobile wallet app.

2.8 Moderators of customisation and knowledge and indirect effects

In this study, moderating variables are knowledge and customisation. Customisation is the capability of mobile wallet companies to gives the customers memorable customised experiences (Hsiao et al., 2016). Generally, customisation is the personalisation of the services and the contents to match the interests and the preference of the customer (Lee and Cranage, 2011). Customisation has been explained as the ability of the firms to personalise and providing the exact expectations and contents to the right people, at the right time and the place, which further leads to positive engagement from the consumers (Tam and Ho, 2005). Customisation influences the ability and aids the consumers to create their own experiences (Chang et al., 2010). The features of the customisations on the mobile wallet app allow the consumers to adjust or change the settings as per their requirements resulting in engagement (Magrath and McCormick, 2013). The mobile wallet apps provide the consumers to store the information in unique ways like profiles, consumer credentials (username and password) for quick and easy transactions (Hsiao et al., 2016) that further leads the companies to provide specific contents and services in a more personalised manner that further help the companies to engage the consumers

(Alnawas and Aburub, 2016). Kim et al. (2010) state that the knowledge about the mobile wallet payment app is one of the two important key factors influencing personnel innovativeness, ability to reach, mobility, convenience, and compatibility to find out the acceptance of the mobile wallet payment app. Studies also show that the consumer has a positive experience and deep knowledge of the mobile wallet payment services have greater the intention to use the mobile wallet app. Thus the following hypotheses have proposed

Hypothesis 8 Customisation and knowledge moderates the relationship between

- compatibility
- knowledge and MWAE.

Hypothesis 8a Customisation moderates the relationship between compatibility and MWAE.

Hypothesis 8b Customisation moderates the relationship between relative advantage and MWAE.

Hypothesis 8c Knowledge moderates the relationship between the compatibility and MWAE.

Hypothesis 8d Knowledge moderates the relationship between the relative advantage and MWAE.

Hypothesis 9 There is an indirect effect of the MWAE on WOM through trust.

Hypothesis 10 There is an indirect effect of the MWAE on WOM through mobile wallet app usage.

3 Methodology

The data was collected by using a survey in the city of Vellore of Tamilnadu state, India. We generally targeted students and millennials of the colleges and universities in the city of Vellore, as they are the frequent and maximum users of the mobile wallet payment services. An electronic version was first distributed as a self-administered questionnaire. Unlike the other method of collecting the data questionnaire, quick data gathering is allowed once the phenomenon is understood (Kranthi and Resmi, 2017). Survey is a method of recording, elicitation, and collecting the data and information from sample respondents (Kirakowski and Corbett, 1993). Apart from the electronic version, we have also distributed printed questionnaires in order to reach respondents from different demographic profiles only those respondents who have used mobile payment wallets last once were shortlisted for gathering data. Over a period of the month, a total of 400 respondents participated in this study. Convenience sampling has been used for this study. Out of this set, 52 filled in questionnaires were not considered due to the insufficient responses given by the respondents. After data cleansing, 348 filled in surveys were taken into the consideration for further analysis.

4 Scale measurement

The scales were adopted from the previous literature for the constructs compatibility, relative advantage from the DIT, customisation, and knowledge, MWAE, trust towards mobile wallet app, WOM, and mobile wallet app usage. For measuring the construct used in this study we have adopted five point Likert scale ranges from 'strongly disagree' (1) to 'strongly agree' (5). The scale was adopted from the previous study to ensure the reliability and validity of this study.29 items are taken into consideration for representing all the constructs like compatibility, relative advantage from the DIT, customisation, knowledge, MWAE, WOM and mobile wallet app usage. The respondent was asked about the clarity, wording, and format.

The compatibility scale has been adopted from Srinivasan et al. (2002). Another variable is a relative advantage which is adopted from Hamad et al. (2017). MWAE scale measurement is adopted from Hollebeek et al. (2014). For measuring the customisation, the scale has been adapted from Rose et al. (2012). The WOM and knowledge scale has been adapted from Kim et al. (2010). Trust towards using the mobile wallet payment services scale has been adopted from the study named Shaw (2014). Lastly, the mobile wallet app usage scale has been adapted from Lewis et al. (2015). Table 2 represents the sources of the scale.

Table 2 Scales measurement

Concept label	*Measurement scales items*	*Sources of measures*
Compatibility	I believe mobile payment is compatible with existing technology.	Srinivasan et al. (2002)
	I believe mobile payment is compatible with other mobile services	
	I believe mobile payment is compatible with my daily routine tasks	
Relative advantage	Using the mobile wallet app enables me to save my time and to accomplish tasks more quickly.	Hamad at al. (2017)
	I get all the information I need for taking care of my transactions more conveniently from mobile wallet payment than the traditional mode of payment.	
	By using mobile wallet payment I get better services from service providers.	
	Using the mobile wallet payment will improve the quality of doing the payment I am looking for	
	I find mobile wallet payment not useful	
	I find the use of mobile wallet payment will have superior features than existing the other service providers.	
Mobile wallet app engagement	Using the brand's app gets me thinking about the brand.	Hollebeek et al. (2014)
	Using the brand's app stimulates my interest in the brand.	
	I feel positive when I use the brand's app.	

Table 2 Scales measurement (continued)

Concept label	*Measurement scales items*	*Sources of measures*
Mobile wallet app engagement	I feel good when I use the brand's app.	Hollebeek et al. (2014)
	I spend a lot of time using the brand's app compared to other brands.	
Customisation	It feels like the mobile wallet app is talking personally to me as a customer.	Rose et al. (2012)
	It is important to me that the mobile wallet app feels like my personal area when I use it.	
	The ability to log into the mobile wallet app makes me feel recognised as a customer.	
Word of mouth	I would like to introduce this mobile wallet brand to others.	Kim et al. (2010)
	I would like to recommend this mobile wallet brand to others	
Trust towards mobile wallet app	Mobile wallet app has adequate features to protect my security	Shaw (2014)
	Mobile wallet app keeps my financial information secure.	
	Mobile wallet app has adequate features to protect my privacy	
	Mobile wallet app keeps my personal data safe.	
	Mobile wallet app is trustworthy.	
Knowledge	I enjoy purchasing products via a mobile device by using a mobile wallet payment	Kim et al. (2010)
	I use the mode of mobile wallet payment mode to make purchases.	
	I mostly use mobile payment when purchasing goods or services via mobile phones.	
	I would be confident to use mobile wallet payment for financial transactions.	
Mobile wallet app usage	I often do you use mobile wallet payment services	Lewis et al. (2015)

5 Statistical analysis

The structural equation model (SEM) is the combination of the multiple regression analysis and factor analysis. It includes both analysis of the covariance structure and causal modelling. Generally, SEM includes both path analysis and confirmatory analysis. A two-step method was used, the measurement model and the structural model. The measurement model is the part of the model that examines the relationship between latent variables and their measures. The measurement model was the first employed through the confirmatory factor analysis for the validating the discriminant and convergent validity of the constructs (Leong et al., 2011). The structural model generally explains the relationship between the latent variables. By using the confirmatory factor analysis

(CFA) a measurement model was established, and further CFA was calculated for validating the convergent and discriminant validity of each construct (Leong et al., 2011). Path analysis was applied to check the association among the constructs. The first step is under SEM to ensure that the operational variables or pre-determined indicators are reliable measures for the latent variables that they represent. The measurement model is done by using CFA to confirm the reliability of the measures and find out the contribution or weight of each observed/indicator variable to the latent variables, i.e., representation of the factor loadings (Pandi et al., 2016). Before proceeding further, we found out the content validity of each instrument used in this study. Generally, content validity is the validity in which the construct is understandable as well as representable in nature (Bharati and Chaudhury, 2004). In the case of content validity, each item used in this study is adopted from the previous literature studies followed to calculate the criterion validity to check how best the predictor is able to predict the dependent variables in this study.

5.1 Need for SEM

The characteristics of its flexibility in validation and model development allow us to consider SEM (Akter et al., 2011). Another reason is that PLS-SEM's provides a simultaneous test of the whole system for the variables in the proposed model and assesses the extent to which the model is consistent with the dataset. The other reason for using the PLS-SEM in the present study is that it includes no assumption about the scale measurements and the populations (Fornell and Bookstein, 1982). Gefen et al. (2000) studied and found that unlike in the first generation techniques like regression, SEM provides a factor analysis and measurement model to be integrated with the single operations (Hsu et al., 2006). Unlike the co-variance based such as AMOS, LISREL. PLS-SEM can tackle less sample size and the soft distributional assumptions. Also, PLS-SEM can be applied in both cases, i.e., exploratory and confirmatory research analysis, and it is much robust to the deviation from the multivariate distributions (Kumar et al., 2002; Gefen et al., 2000).

Generally, PLS-SEM is very appealing to many researchers as it provides an option to estimate the complex models with various variables, indicators, constructs, and the structure path without including distributed assumptions in the dataset. Generally, PLS-SEM is a causal predictive approach that focuses on predicting the statistical proposed models whose structures are made to give the causal explanations (Sarstedt et al., 2017; Wold, 1975). Another reason is that PLS-SEM requires less technical knowledge like PLS-graph (Chin, 2003), smart PLS (Ringle et al., 2005, 2015). There are some more assumptions taken into consideration in the present studies to use PLS-SEM. These are as follows:

- When the analysis discusses testing a proposed conceptual model from the predictive perspective.
- When the structural model is so complex, complications include various indicators, constructs, variables, or the model relationship used in the present study.
- When the objective of the study is to understand better increasing the complexities by exploring the theoretical extensions of established and validated theories.

- When the small population restricts the sample size, like in the present study sample size is 348, then PLS-SEM is best suited for it.
- When the research like present study needs a latent variables scores for the next analysis.

5.2 Convergent validity and construct reliability

Reliability explains the consistency of the scale that measures a construct (Leong et al., 2011). If the scale is adapted from the previous literature for measuring the constructs used in this study, Cronbach's alpha must be greater than 0.70 (Nunnally and Bernstein, 1994). Convergent validity explains the constructability to give unified results and construct validity indicates whether the scale measures what exactly it is intended to measure. The yardstick for the convergent validity is that all the composite reliability should be greater than 0.70 followed by the factor loading, which must be greater than 0.50 and the average variance extraction must be higher than 0.50. Table 3 illustrates that all these criteria have been met. Hence it has been confirmed and verified statistically that the convergent Validity and construct reliability criteria have been met.

Composite reliability is calculated based on the actual loading of the variables represented and exceeded by.70. Cronbach alpha is the value that is the measurement of the internal consistency closely related to the set of items considered a group. It is called scale measurement reliability. The average variance extraction explains the amount of the variance captured by the construct concerning the variance amount due to the measurement error. Table 3 lists the measures of reliability and validity.

Table 3 Convergent validity and construct reliability

Concept label	*Item labels*	*Factor loading*	*AVE*	*CR*	*Cronbach alpha*
Compatibility			0.636	0.874	0.809
	Compatibility 1	0.824			
	Compatibility 2	0.824			
	Compatibility 3	0.806			
Relative advantage (RA)			0.669	0.859	0.796
	RA1	0.769			
	RA2	0.790			
	RA3	0.777			
	RA4	0.789			
	RA5	0.650			
	RA6	0.713			
MWAE			0.565	0.866	0.808
	MWAE1	0.742			
	MWAE2	0.713			
	MWAE3	0.794			
	MWAE4	0.782			

Table 3 Convergent validity and construct reliability (continued)

Concept label	*Item labels*	*Factor loading*	*AVE*	*CR*	*Cronbach alpha*
	MWAE5	0.726			
Customisation			0.524	0.767	0.833
	Customisation 1	0.798			
	Customisation 2	0.530			
	Customisation 3	0.671			
WOM			0.850	0.919	0.824
	WOM1	0.925			
	WOM2	0.919			
Trust towards mobile wallet app			0.554	0.859	0.796
	Trust towards mobile wallet app 1	0.590			
	Trust towards mobile wallet app 2	0.767			
	Trust towards mobile wallet app 3	0.806			
	Trust towards mobile wallet app 4	0.807			
	Trust towards mobile wallet app 5	0.730			
Knowledge			0.628	0.870	0.801
	Knowledge 1	0.762			
	Knowledge 2	0.799			
	Knowledge 3	0.853			
	Knowledge 4	0.752			
Mobile wallet app usage			0.636	0.874	0.809
	Mobile wallet	0.722			

5.3 Confirmatory factor analysis

For conducting the confirmatory factor analysis, discriminant validity is looked at for satisfying that each item of the instrument is dissimilar from each other. The average variance extraction square root must be higher than the correlation coefficient.

To ensure every scale item in an instrument uniquely different from each other, discriminant validity is assessed. Discriminant validity is satisfied if all maximum shared values and average shared value are less than the average variance extraction or the average variance extraction square root, which is greater than their correlation coefficient. It is represented in Table 4. In the present study discriminant, validity is conducted by using the Fornell and Larcker method.

Table 5 represents the key influences of compatibility and relative advantage on the MWAE. This study found that the relative advantage influences MWAE which in turn

influences trust. Trust further influences mobile wallet app usage. At last, mobile wallet app usage also directly influences WOM. Table 5 represents regression weight that signifies that the hypothesised relationships are statically significant. Therefore, accepting or rejecting the hypotheses is based on the T-statistics value which must be greater than 1.96. In the below-mentioned table, all the relationships comply with beta value of more than 1.96, due to which all the established relationships are supported.

Table 4 Discriminant validity by Fornell and Larcker (1981) method and criterion validity

	Mobile wallet app usage	*Compatibility*	*Relative advantage*	*Trust*	*MWAE*	*WOM*
AVE->	0.636	0.669	0.562	0.554	0.850	0.565
Mobile wallet app usage	*0.797*					
Compatibility	0.505	*0.818*				
Relative advantage	0.594	0.768	*0.749*			
Trust	0.667	0.518	0.555	*0.744*		
MWAE	0.489	0.437	0.545	0.513	*0.922*	
WOM	0.481	0.594	0.698	0.542	0.451	*0.751*

Note: Value with the diagonals are the square roots of the average variance extraction and italics cell indicates criterion validity.

Table 5 Regression weight

Hypotheses	*Effect type*	*Regression path*	*Beta value*	*T-statistics*	*R square*	*Supported*
H1	Direct	Compatibility → MWAE	0.196	2.016	0.811	Yes
H2	Direct	Relative advantage → MWAE	0.743	5.618	0.811	Yes
H3	Direct	MWAE → Trust	0.804	6.135	0.646	Yes
H4	Direct	Trust →mobile wallet app usage	0.730	7.457	0.533	Yes
H5	Direct	Mobile wallet app usage → WOM	0.715	7.234	0.511	Yes

This research also investigated the direct and indirect effects of MWAE on WOM to trust, and mobile wallet app usage towards mobile wallet app adoption. The sequence of the hypothesised relationship is examined by using the sequential mediation mechanism. For that, we used SPSS MACRO process (Hayes, 2013) to test the sequential mediation, as given in Table 6. After that, we run bootstrapping to test the mediation effect on 1,000 bootstrapping samples with the 95 % confidence interval (CI), which is suggested by Preacher and Hayes (2008). The findings reveal that MWAE is directly influenced by the WOM (T value = 3.348, and P value = 0.0009). Hence H8 is supported. Furthermore, the statistical results also supported the significant mediating indirect effect of the MWAE on WOM through trust is also significant (ULCI = 0.1962 and LICI = 0.721), supporting H9, in the same way, the significant indirect mediating effect of MWAE on the WOM through mobile wallet app usage is also significant (ULCI = 0.0542 and LICI = 0.0066) supporting H10. Finally, our study also provides the statistical support for the sequential mediating effects of MWAE on WOM through trust and mobile wallet app usage towards

using the mobile wallet adoption was also found significant (ULCI = 0.0817 and LICI = 0.0150). Therefore, H7 is supported. Tables 6 and 7 represents the statistical results of sequential mediation analysis for total effect, the direct and indirect effect of MWAE on WOM through trust and mobile wallet app usage. The criteria for accepting or rejecting the hypotheses is that in the upper bound confidence interval (ULCI) level and lower bound confidence interval (LICI) level, the values must be lies in the same side of timelines either may be positive or negative. So as per as this rule all hypotheses has been accepted except H8b and H8c.

Table 6 Total effect, direct effect and indirect effect (by using MACRO plug-ins suggested by Hayes)

Hypothesis	*Effect*	*Regression path*	*Standard error (SE)*	*T value*	*P value*	*Upper bound confidence interval*	*Lower bound confidence interval*	*Supported*
H6	Direct	MWAE → WOM	0.0492	3.348	0.0009	0.2615	0.0678	Yes
Hypothesis	*Effect*	*Regression path*	*Boot (SE)*	*(ULCI)*	*(LICI)*	*Supported*		
H7	Indirect	MWAE → trust → mobile wallet app usage → WOM	0.0172	0.0817	0.0150	Yes		

Table 7 Indirect effect of MWAE to WOM

Hypothesis	*Effect*	*Regression path*	*Boot (SE)*	*(ULCI)*	*(LICI)*	*Supported*
H9	Indirect	MWAE → trust → WOM	0.0316	0.1962	0.0721	Yes
Hypothesis	*Effect*	*Regression path*	*Boot (SE)*	*(ULCI)*	*(LICI)*	*Supported*
H10	Indirect	MWAE → mobile wallet app usage → WOM	0.0316	0.0542	0.0066	Yes

Table 8 Moderator effect of customisation on compatibility and MWAE

Hypothesis	*Regression path*	*Effect type*	*Original sample*	*Sample mean*
H8a	Compatibility * Customisation → MWAE	Indirect	0.834	0.222
Hypothesis	*Standard deviation*	*Standard error*	*T statistics*	*Moderation effect*
H8a	0.424	0.424	1.977	Yes

Table 9 Moderator effect of knowledge on compatibility and MWAE

Hypothesis	*Regression path*	*Effect type*	*Original sample*	*Sample mean*
H8b	Compatibility * Knowledge → MWAE	Indirect	0.202	0.248
Hypothesis	*Standard deviation*	*Standard error*	*T statistics*	*Moderation effect*
H8b	0.596	0.596	0.338	No

5.4 Moderating effect analysis

The result of this study shows that there is a moderating effect of knowledge on the relationship between relative advantage and MWAE. Customisation also acts as a moderator between compatibility and MWAE. It is also found that knowledge does not moderate the relationship between compatibility and MWAE. Customisation also does not moderate the relationship between the relative advantage and MWAE. The entire results have been represented in Tables 8, 9, 10 and 11.

Table 10 Moderator effect of customisation on relative advantage and MWAE

Hypothesis	*Regression path*	*Effect type*	*Original sample*	*Sample mean*
H8c	Relative advantage * customisation → MWAE	Indirect	0.4066	0.3673
Hypothesis	*Standard deviation*	*Standard error*	*T statistics*	*Moderation effect*
H8c	0.3985	0.3985	1.0204	No

Table 11 Moderator effect of knowledge on relative advantage and MWAE

Hypothesis	*Regression path*	*Effect type*	*Original sample*	*Sample mean*
H8d	Relative advantage * knowledge → MWAE	Indirect	0.770	0.685
Hypothesis	*Standard deviation*	*Standard error*	*T statistics*	*Moderation effect*
H8d	0.335	0.335	2.299	Yes

6 Cluster analysis

Cluster analysis was applied to analyse the different target groups with the inherent particular needs that motivate them towards the MWAE followed by the WOM recommendations. A two-step clustering process was applied. Firstly hierarchical cluster is applied to gain insights into the total number of clusters. Secondly, K-means clustering is applied to analyse the individual profile of the respondents which is belonging to their respective clusters. K means cluster was applied out using the average scores of the different factors which effect the MWAE which further leads to the WOM recommendations. The principle behind the formation of the different groups in the concept of the squared Euclidian distance. The identified clusters were labelled appropriately. It can also be most of the respondents have same opinions in the context of the mobile wallet payment engagement followed by the WOM recommendations. To find out the particular profiling of the cases and the number of cases which is belong to each cluster a K-means cluster is applied.

A sample of 348 mobile wallet app users was clustered into the three groups by using the hierarchical cluster methods. The k-means cluster was applied for the segmentation of the users into the groups. This method further help to minimises within the cluster distances that further maximises between the cluster distances till a point final cluster were analysed. The average score of the different mobile wallet app users like compatibility, relative advantage, customisation, WOM, trust, knowledge and MWAE were used for the segmentation process. The statements used are on the five point scale

with 1 = strongly disagree and 5 = strongly agree. The results connotes that average score for the above mentioned factors are significantly different among the three clusters as represented in the one way ANOVA results mentioned in Table 12.

Table 12 One way ANOVA result

	Cluster		*Error*		*F*	*Sig*
	Mean square	*df*	*Mean square*	*df*		
Compatibility	35.957	2	0.472	308	76.115	0.000
Relative advantage	18.023	2	0.488	308	36.952	0.000
Customisation	72.704	2	0.361	308	201.349	0.000
Word of mouth	6.028	2	1.071	308	5.628	0.000
Trust	84.294	2	0.258	308	327.103	0.000
Knowledge	76.762	2	0.345	308	222.401	0.000
Mobile wallet app engagement	62.629	2	0.699	308	89.579	0.000

The results of the cluster analysis has suggested that the three clusters have different affinity towards the factors that influence the MWAE that further leads to the WOM recommendations among the Indian mobile wallet app users. These three mobile wallet app users segments distinctly different from one another in terms of an importance that they attach to the factors that influence the MWAE followed by WOM recommendations. As the next step we analyse the final cluster scores across all the factors of the MWAE. From Table 13 it is found that cluster 1 respondents have almost neutral towards all the factors that influence the MWAE. Cluster 2 represents the respondents for whom all the factors, compatibility, relative advantage, customisation, WOM, trust, knowledge and MWAE plays an important role that influence the mobile wallet app usage and that further leads to the WOM recommendations. From cluster 2 it can easily be inferred that the users are happy and engage themselves leading to WOM because mobile wallet app is compatible to their needs and it adds advantages over the conventional mode of payments like cash or card transaction. The mobile wallet payment services could be perceived by these users to be user friendly that builds the consumers trust and beliefs towards the wallet payment. Apart from that users are also having enough knowledge about the step to complete the transactions that further leads to the engagement towards the mobile wallet payment services that further leads to the positive WOM recommendations. The 3rd cluster represents that all antecedents and do not influence MWAE thus leading to non-usage and might not create WOM recommendations among their friends, colleagues, relatives acquaintances, etc. The first cluster has 126 respondents, second clusters has 147 respondents followed by third cluster with 75 respondents. It can be seen that the cluster 2 scores highest on all the factors while cluster 3 scores represents that least. Cluster 1 and cluster 3 can be treated as the two extreme behaviours while cluster 2 score somewhere in between the two clusters. Figure 2 represents the dendogram that shows the number of clusters present in the total sample used for the study.

Figure 2 Dendrogram

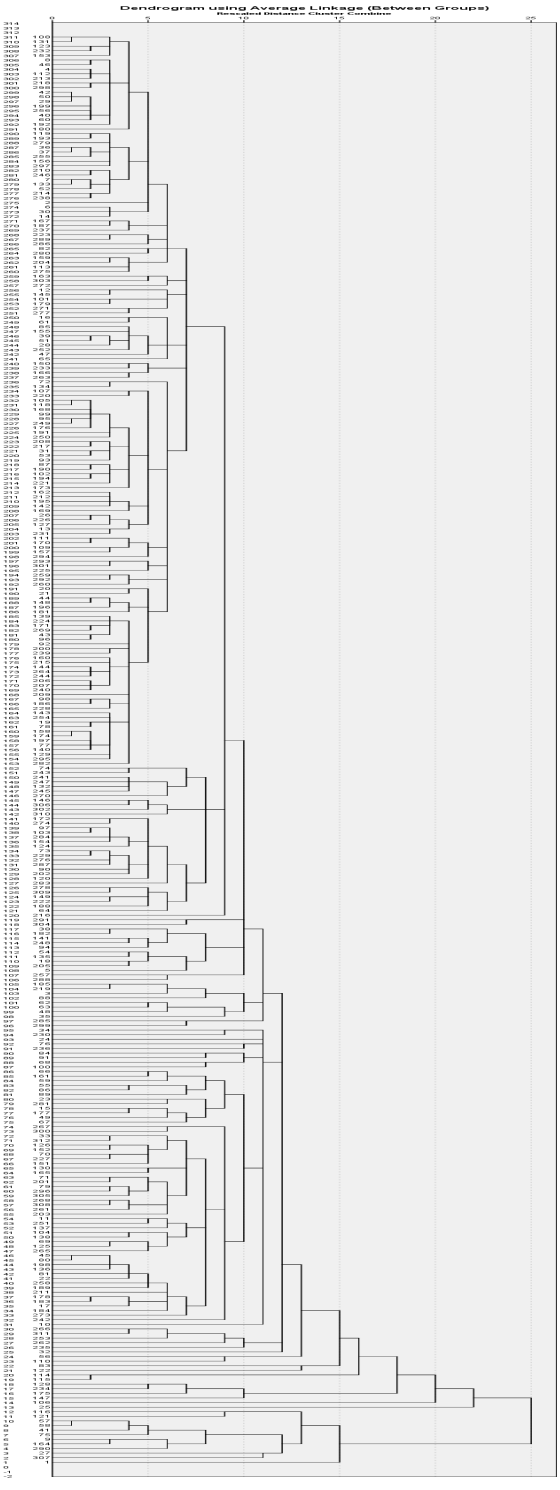


Table 13 Final cluster showing differences in the average scores across the three clusters

MWAE factors	*Cluster 1*	*Cluster 2*	*Cluster 3*
Compatibility	3.510582011	4.045351474	2.543859649
Relative advantage	3.292328042	3.716553288	2.675438596
Customisation	3.809523810	4.603174603	2.482456140
Word of mouth	3.5	3.8	3.3
Trust	3.7	4.6	2.4
Knowledge	3.37	4.36	2.29
Mobile wallet app engagement	4	5	3
Number of cases (N)	126	147	75

7 Discussion

In today's era of mobile commerce, mobile wallet payment services apps marketers and other stakeholders need to develop a deep insight into the factors that motivate the Indian consumers to complete the transactions by using mobile wallets payment services, while shopping. Various researchers and firms have undertaken this job to increase the existing knowledge in online platforms like mobile commerce, mobile banking, and mobile wallet payment services (Khan and Syed, 2018). On examining the responses from the mobile wallet app users, this study identifies the factors that affect the engagement of the consumers using mobile wallet apps. The path shows that trust has the highest magnitude and positively influences the mobile wallet app usage (beta value = 0.730 with t-statistics = 7.457). Hence, H4 is supported. It shows that if consumers have trust in the mobile wallet app, then there is a chance of increasing mobile wallet app usage.

Another path is that mobile wallet app usage has a positive influence on the WOM (beta value = 0.715 with t-statistics = 7.234). The mobile wallet app usage is helpful for the company to grab and retain more and more consumers in a shorter span with a low cost by spreading by the user about the positive words about the company. The finding of this Hypothesis 5 is aligned with the previous study (Mclean, 2018). Hence Hypothesis 5 is supported. Hypothesis 3 represents the path connecting MWAE with trust. This path is significant and accepted. The result of this hypothesis suggested that the MWAE influences the trust but at a lesser magnitude (beta value = 0.804 and t statistics = 6.135) in comparison to the WOM and mobile wallet app usage. Another path connecting, i.e., Hypothesis 2, is that relative advantage has a positive influence on MWAE. It means that if the mobile wallet app replaced in the terms of superiority and its usage as a comparison to the other wallet apps the result of this hypothesis has shown that relative advantage has a positive influence on the MWAE (beta value = 0.743 and t statistics = 5.618). Hypothesis 1 denotes the path, i.e., compatibility has a positive influence on the MWAE (beta value = 0.196 and t statistics = 2.016). It means that if the mobile wallet app is compatible, i.e., easy to use, friendly interface and their attributes with full features of customisation then it will help the company and the consumer to engage towards the mobile wallet app. Another finding of this study is the role of moderating variables like customisation and knowledge. There is an interaction or the moderation effect of customisation between the compatibility and MWAE; hence Hypothesis 8a is supported.

On the other hand, there is no moderation effect of customisation between relative advantage and MWAE. Hence, Hypothesis 8c is not supported. Another interaction or moderation effect is knowledge which also interacts between the relative advantage and MWAE; hence, Hypothesis 8d is supported. On the other hand, there is no moderation effect of knowledge between compatibility and MWAE. Hence, Hypothesis 8b was not supported.

8 Contributions

The main objective of the present study is to identify the factors that impact the MWAE, and to find whether it leads to trust and usage of mobile wallets, which might further affect WOM recommendations. In the present study, compatibility and relative advantage were identified as the possible predictors of the MWAE that contribute to the existing body of the literature. Another moderator variable identified is knowledge, which acts as a moderator between compatibility, relative advantage, and MWAE. Knowledge is one of the crucial moderators that contribute through this study in the existing body of literature. The critical determinants of the mobile wallet engagement were identified successfully and verified using linear models. Moreover, the present study's findings reveal that the relative advantage and compatibility positively impacts MWAE. Knowledge and customisation do not moderate the relationship. These are some theoretical contributions that have contributed to the existing body of knowledge through the present study. The cluster analysis has been applied and three clusters were identified. It was found that cluster 2 respondents exhibit MWAE, developing trust and use mobile wallet apps that further leads to the WOM recommendations. After applying the cluster analysis, the current findings of the study act as the theoretical contributions towards the existing body of knowledge or the existing works of literature.

9 Implications

This study has important implications which are discussed under various subheadings:

9.1 Theoretical implications

The variables from the diffusion of innovation theory that act as antecedents for the MWAE has been expanded by adding moderating variables like customisation and knowledge. There are a few studies on these interactions and hence this gap has been addressed in our study. Therefore, this study tested the role of the moderating variable like customisation and knowledge that moderate the relationship between the variables used in this study. This study also added the variables like trust towards using the mobile wallet app, the mobile wallet app usage, MWAE. The extended diffusion of innovation theory applied in this study can contribute to the knowledge bank, and it was tested and verified by using the advanced tools, techniques, and statistical analysis. The findings of this study will help to bridge the gap of the knowledge which is pertaining to the antecedent of the MWAE and the role of the moderating variable like customisation and knowledge.

9.2 Managerial implications

In today's era, there is a vast increase in the use of mobile devices, so this study aims to understand the factors for the MWAE. To understand the deep insights about the engagement of the users towards the mobile wallet, we used diffusion of innovation theory and its variables with compatibility and relative advantage, and at the same time, we also tested the effect of moderating variables like customisation and knowledge with the WOM. The findings of this study will give insights into the user's patterns and trends to use the technology which will help the mobile wallet company. To increase the compatibility with the mobile wallet app, more attributes or features should be incorporated into the system. The system should be added with the shopping portal to make it a more user-friendly interface which further increases the level of compatibility as per as needs of the consumers. The mobile wallet service providers should also upgrade the new technologies by innovating the payment gateway so that the consumers will check out using the payment gateway and this will help to increase the positive WOM about the concerned mobile wallet company. Mobile wallet companies should also invest in research and development activities to generate new ideas that can be developed to further improve the system compatibility.

Further it helps the companies to increase the positive WOM about the mobile wallet. Practitioners should also find ways to interact with users and obtain the data about the users to provide the customised services as per the needs of the consumers for further spread the WOM about the mobile wallet company. There is also a need to understand the consumer's lifestyle and include their preferences as per the consumers' needs

Relative advantage is defined as how superior and advantageous it is to use mobile wallet over other types of payment options. It helps the mobile wallet service providers in building their strength and also gives an opportunity to retain, attract consumers for a longer period.

Such an advantage is very helpful in the service sector to gain competitive advantage. Over a period of time, WOM influenced by mobile wallet usage aided by trust will further help to increase the mobile wallet app usage towards the mobile wallet brand and loyalty towards specific mobile wallet payment services. The mobile wallet companies, service providers and the banks must more focus on making the services user-friendly, compatible, secure, convenient and consistent with the lifestyle of the users so that they will engage with the mobile wallet payment services that further leads to spread word about their delightful experiences as a positive recommendation among friends, colleagues, acquaintances, etc. The mobile wallet companies should also focus more on simplifying the user's interface.

9.3 Social implications

Acceptance of the mobile wallet payment services can help to address the economic and social challenges in India, like tax evasion, financial inclusions, and corruption. Given the awareness about the mobile wallet payment services via WOM, which already faces the retention and acquisition challenges, one can expect to face the continued resistance in the future. This study provides important insights to overcome such resistance and enhance adoption. This study also has policy implications. Payment players and providers who were unsuccessful earlier in signing on, the users launched an advertising and promotional blitz across India, and people started to sign up in record numbers. Since

about 342 million people accessed the internet from their phones, the government has established dial-in services for the digital or app payments for those with the basics of no-frill mobile phones. In spite of this, mobile wallet providers and government pushing for the replacement of hard currency, most of the users had low or no balance, which made it easier to switch the providers (Kumari, 2017).

10 Future directions

The conceptual research model does not include all constructs of the DIT. Future studies should also explore other adoption models like TAM, TAM2, TAM3, UTAUT1, UTAUT2 (Venkatesh et al., 2012), technology organisational environment framework, expectation confirmation theory, Transtheoretical model of change.

The effect of time can also be studied in the impending years by conducting longitudinal research. A cross country or cross-culture study would also be accompanied to expand further study for generalisability. Besides, that other potential determinants or antecedents can be considered for future studies, namely individuals characteristics, demographic consumer profiles, government policies, and financial risks, intrinsic and extrinsic motivations in order to increase the explanatory power of having the influence of predicting the event. Lastly, this study only confirms the role of customisation and knowledge in the mobile wallet app to further, increase engagement with mobile wallet apps. Future studies should also discover the appropriate features of the mobile wallet app customisation that can further help companies increase MWAE. To understand more deeply about consumer behaviour, there is also a need to use the artificial neural network to understand more deeply in understanding the pulse of the consumers towards using the selection and usage of the mobile wallet apps.

The present study only focused on the mobile wallet payment services and their applications. Future studies could explore other types of mobile commerce applications like near field communications, mobile banking, mobile commerce, Quick response payment, contactless payment; Aadhar based payments, bio-metric payment, etc. The customisation and knowledge that act as the moderators are considered in the present study. There are so many other moderating variables that need to be added for further studies. In the future, there is a need to have a larger sample size for further study. The data analysis would be used with different software and tools like AMOS, LISREL. To increase the explanatory power and fitness of the model, there is a need to use the other soft computational tools and techniques like soft computational, artificial neural network, support vector machines, naive Bayes, rough set theory, decision tree, fuzzy logic, sentimental analysis, and other soft computational mathematical techniques and tools. These tools, methods, and techniques further help understand the user pulse towards the usage and selection of the mobile wallet payment and its engagement, leading to word-of-mouth recommendations.

11 Limitations

The outcomes of this study were limited because this study was carried out in developing a county like India and the results of this study cannot be applied to make any statistical inferences on markets which is different from India. In line with the various longitudinal studies, the sample size of the present studies is less due to the respondents not responding and dropping out of the study. The present study only focuses only on the online app platform related to mobile wallet payment services and its engagement. While the variables studied in the present study are not conclusive of the entire variables capable of impacting the MWAE. Another limitation is that mobile wallet app customisation enhances consumer engagement with mobile commerce applications. Therefore, there is significantly less sample size has been taken into consideration for the study. The present study data analysis has been done using tools and software like SPSS and SEM-PLS. The present study is based on the consumers' perception of mobile wallet payment adoption, leading to the users' engagement. This study does not gather any data from the mobile wallet payment service provider. The present study only considered collecting the responses from the urban areas related to the factors that influence the MWAE that further leads to the WOM recommendations.

12 Conclusions

The contribution of this study lies in the identification of the antecedents of MWAE by proposing a conceptual framework and integrating the constructs like compatibility and the relative advantage in the Indian context using diffusion of innovation theory. This study gives an insight into the role of moderating variables like knowledge and customisation in the context of the MWAE. This study will give insights into the mobile wallet industry players and it will further guide the marketing and development of their services better than the current services. By investigating the factors and the moderating variables that influence the MWAE followed by WOM recommendations, respondents were categorised into the three clusters, i.e., cluster1, cluster 2, cluster 3. The average score of the five factors is significantly different among the clusters. Out of the three clusters, cluster 2 was highly proactive towards MWAE, leading to word-of-mouth recommendations. They perceive mobile wallet payment services as the highly trustworthy, convenient, and efficient mobile wallet payment services channel. It is advantageous to retain and target the cluster 2 segment as this segment will help the company engage consumers in mobile wallet apps that further lead to word-of-mouth recommendations. In cluster 3, respondents do not much opt for mobile wallet engagement, so attracting and retaining the users, the mobile wallet company should focus on making compatible as per the users' lifestyle, increasing the consumers' ease of use and usefulness. Companies should also highlight the benefits, attributes, and features that emphasise that mobile wallet payment adds advantages over conventional payments like cash or debit and credit card payment systems. Overall, the average score of the knowledge towards the mobile wallet payment service is lowest among all the factors across segments. This shows that there is a lack of knowledge about the aspects of the mobile wallet usage and benefits. Companies and government should invest much in

awareness, advertisement and conduct a campaign to aware the consumers of the benefits, attributes, features, and advantages of the mobile wallet payment that further leads to the engagement in and usage of M-wallets by the consumers aiding digital payments and to understand the extent of the smaller transactions that take place in the unorganised sector.

References

Agarwal, R. and Prasad, J. (1999) 'Are individual differences germane to the acceptance of new information technologies?', *Decision Sciences*, Vol. 30, No. 2, pp.361–391.

Akter, S., D'Ambra, J. and Ray, P. (2011) 'Trustworthiness in mHealth information services: an assessment of a hierarchical model with mediating and moderating effects using partial least squares (PLS)', *Journal of the American Society for Information Science and Technology*, Vol. 62, No. 1, pp.100–116.

Alaeddin, O., Rana, A., Zainudin, Z. and Kamarudin, F. (2018) 'From physical to digital: investigating consumer behaviour of switching to mobile wallet', *Polish Journal of Management Studies*, Vol. 17, No. 2, pp.18–30.

Al-Dwairi, R., Abu-Shanab, E. and Daradkeh, M. (2018) 'A framework for antecedents of trust in social commerce', *International Journal of Enterprise Network Management*, Vol. 9, Nos. 3–4, pp.333–351.

Alnawas, I. and Aburub, F. (2016) 'The effect of benefits generated from interacting with branded mobile apps on consumer satisfaction and purchase intentions', *Journal of Retailing and Consumer Services*, Vol. 31, pp.313–322.

Anderson, E. and Weitz, B. (1989) 'Determinants of continuity in conventional industrial channel dyads', *Marketing Science*, Vol. 8, No. 4, pp.310–323.

Anderson, E.W. (1998) 'Customer satisfaction and WOM', *Journal of Service Research*, Vol. 1, No. 1, pp.5–17.

Aydin, G. and Burnaz, S. (2016) 'Adoption of mobile payment systems: a study on mobile wallets', *Journal of Business, Economics, and Finance*, Vol. 5, No. 1, pp.73–92.

Bellman, S., Potter, R.F., Treleaven-Hassard, S., Robinson, J.A. and Varan, D. (2011) 'The effectiveness of branded mobile phone apps', *Journal of interactive Marketing*, Vol. 25, No. 4, pp.191–200.

Bone, P.F. (1995) 'Word-of-mouth effects on short-term and long-term product judgments', *Journal of Business Research*, Vol. 32, No. 3, pp.213–223.

Brodie, R.J., Ilic, A., Juric, B. and Hollebeek, L. (2013) 'Consumer engagement in a virtual brand community: an exploratory analysis', *Journal of Business Research*, Vol. 66, No. 1, pp.105–114.

Brown, T.J., Barry, T.E., Dacin, P.A. and Gunst, R.F. (2005) 'Spreading the word: Investigating antecedents of consumers' positive word-of-mouth intentions and behaviors in a retailing context', *Journal of the Academy of Marketing Science*, Vol. 33, No. 2, pp.123–138.

Chang, W.L., Yuan, S.T. and Hsu, C.W. (2010) 'Creating the experience economy in ecommerce', *Communications of the ACM*, Vol. 53, No. 7, pp.122–127.

Chapman, P., Selvarajah, S. and Webster, J. (1999) 'Engagement in multimedia training systems', in *Proceedings of the 32nd Annual Hawaii International Conference on Systems Sciences. 1999. HICSS-32*, Abstracts and CD-ROM of Full Papers, IEEE, January, p.9.

Chin, W.W. (2003) *PLS Graph 3.0*, Soft Modeling Inc., Houston.

Connolly, R. and Bannister, F. (2007) 'Consumer trust in electronic commerce: social & technical antecedents', *World Academy of Science, Engineering and Technology*, Vol. 34, pp.239–248.

De Matos, C.A. and Rossi, C.A.V. (2008) 'Word-of-mouth communications in marketing: a meta-analytic review of the antecedents and moderators', *Journal of the Academy of Marketing Science*, Vol. 36, No. 4, pp.578–596.

Duane, A., O'Reilly, P. and Andreev, P. (2014) 'Realizing M-payments: modeling consumers' willingness to M-pay using smart phones', *Behaviour & Information Technology*, Vol. 33, No. 4, pp.318–334.

Fang, J., Zhao, Z., Wen, C. and Wang, R. (2017) 'Design and performance attribute driving mobile travel application engagement', *International Journal of Information Management*, Vol. 37, No. 4, pp.269–283.

Feick, L.F., Price, L.L. and Higie, R.A. (1986) 'People who use people: the other side of opinion leadership', *ACR North American Advances*.

Fornell, C. and Bookstein, F.L. (1982) 'Two structural equation models: LISREL and PLS applied to consumer exit-voice theory', *Journal of Marketing Research*, November, Vol. XIX, No. 4, pp.440–452.

Fornell, C. and Larcker, D.F. (1981) 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, Vol. 18, No. 1, pp.39–50.

Gefen, D., Karahanna, E. and Straub, D.W. (2003) 'Trust and TAM in online shopping: an integrated model', *MIS Quarterly*, pp.51–90.

Gefen, D., Straub, D. and Boudreau, M.C. (2000) 'Structural equation modeling and regression: guidelines for research practice', *Communications of the Association for Information Systems,* Vol. 4, No. 1, p.7.

Hamad, A.A.A., Petri, I., Rezgui, Y. and Kwan, A. (2017) 'Towards the innovation of an integrated 'one-stop-shop online services utility management: exploring customer technology acceptance', *Sustainable Cities and Society*, Vol. 34, pp.126–143.

Hardgrave, B.C., Davis, F.D. and Riemenschneider, C.K. (2003) 'Investigating the determinants of software developers' intentions to follow methodologies', *Journal of Management Information Systems*, Vol. 20, No. 1, pp.123–151.

Harter, J.K., Schmidt, F.L. and Hayes, T.L. (2002) 'Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta-analysis', *Journal of Applied Psychology*, Vol. 87, No. 2, p.268.

Hayes, A.F. (2013) *Introduction to Mediation, Moderation, and Conditional Process Analysis: Methodology in the Social Sciences*, p.193, Guilford Publications, New York, NY, USA.

Hollebeek, L.D. (2011) 'Demystifying customer brand engagement: exploring the loyalty nexus', *Journal of Marketing Management*, Vol. 27, Nos. 7–8, pp.785–807.

Hollebeek, L.D., Glynn, M.S. and Brodie, R.J. (2014) 'Consumer brand engagement in social media: conceptualization, scale development, and validation', *Journal of Interactive Marketing*, Vol. 28, No. 2, pp.149–165.

Hong, S.T., Shin, J.C. and Kang, M.S. (2008) 'Study of factors affecting adoption intention toward home use robot services', *Asian Market Journal*, Vol. 9, No. 4, pp.71–303.

Hsiao, C.H., Chang, J.J. and Tang, K.Y. (2016) 'Exploring the influential factors in continuance usage of mobile social apps: satisfaction, habit, and customer value perspectives', *Telematics and Informatics*, Vol. 33, No. 2, pp.342–355.

Hsu, S.H., Chen, W.H. and Hsieh, M.J. (2006) 'Robustness testing of PLS, LISREL, EQS and ANN-based SEM for measuring customer satisfaction', *Total Quality Management & Business Excellence*, Vol. 17, No. 3, pp.355–372.

Joseph, J., Sriram, K.V., Rodrigues, L.L., Mathew, A.O. and Gana, K.C. (2018) 'An empirical study on customer adoption of mobile payment application in India', *International Journal of Enterprise Network Management*, Vol. 9, Nos. 3–4, pp.363–375.

Kahn, W.A. (1990) 'Psychological conditions of personal engagement and disengagement at work', *Academy of Management Journal*, Vol. 33, No. 4, pp.692–724.

Khan, A. and Syed, A.A. (2018) 'Determinants of online consumer behaviour towards e-tailing in India', *International Journal of Enterprise Network Management*, Vol. 9, Nos. 3–4, pp.455–480.

Kim, C., Mirusmonov, M. and Lee, I. (2010) 'An empirical examination of factors influencing the intention to use mobile payment', *Computers in Human Behavior*, Vol. 26, No. 3, pp.310–322.

Kim, D.J., Ferrin, D.L. and Rao, H.R., (2008) 'A trust-based consumer decision-making model in electronic commerce: the role of trust, perceived risk, and their antecedents', *Decision Support Systems*, Vol. 44, No. 2, pp.544–564.

Kim, E., Lin, J.S. and Sung, Y. (2013) 'To app or not to the app: engaging consumers via branded mobile apps', *Journal of Interactive Advertising*, Vol. 13, No. 1, pp.53–65.

Kim, M.J., Chung, N. and Lee, C.K. (2011) 'The effect of perceived trust on electronic commerce: shopping online for tourism products and services in South Korea', *Tourism Management*, Vol. 32, No. 2, pp.256–265.

Kirakowski, J. and Corbett, M. (1993) 'SUMI: the software usability measurement inventory', *British Journal of Educational Technology*, Vol. 24, No. 3, pp.210–212.

Kiruthika, A., Chandramohan, S., Punniyamoorthy, M. and Latha, S. (2012) 'Evaluation of service quality of banks – a fuzzy approach', *International Journal of Enterprise Network Management*, Vol. 5, No. 4, pp.333–354.

Kowatsch, T. and Maass, W. (2010) 'In-store consumer behavior: how mobile recommendation agents influence usage intentions, product purchases, and store preferences', *Computers in Human Behavior*, Vol. 26, No. 4, pp.697–704.

Kranthi, A.K. and Ahmed, K.A. (2018) 'Determinants of smartwatch adoption among IT professionals-an extended UTAUT2 model for smartwatch enterprise', *International Journal of Enterprise Network Management*, Vol. 9, Nos. 3–4, pp.294–316.

Kranthi, A.K. and Resmi, A.T. (2017) 'Learning in academic enterprise-a study on antecedents using Lisrel8. 7 and Smart PLS 2.0', *International Journal of Enterprise Network Management*, Vol. 8, No. 2, pp.141–154.

Kumar, V., Deregowska, D. and Sprott, E. (2002) 'Latent structural modeling: choosing between structural equation modeling and partial least squares', *Administrative Sciences Association of Canada*, Vol. 23, No. 2, pp.1–10.

Kumari, P. (2017) *Cashing in on Cashless Transactions: The Threats to M-Wallets* [online] http://theindiane conomist.com/cashless-transactions-e-wallets/ (accessed 11 January 2018).

Lai, D.C., Lai, I.K. and Jordan, E. (2010) 'A model for the study of user adoption behaviours of mobile commerce', *International Journal of Enterprise Network Management*, Vol. 4, No. 1, pp.16–25.

Lee, C.H. and Cranage, D.A. (2011) 'Personalization-privacy paradox: the effects of personalization and privacy assurance on customer responses to travel web sites', *Tourism Management*, Vol. 32, No. 5, pp.987–994.

Lee, Y.H., Hsieh, Y.C. and Hsu, C.N. (2011) 'Adding innovation diffusion theory to the technology acceptance model: supporting employees' intentions to use e-learning systems', *Journal of Educational Technology & Society*, Vol. 14, No. 4, pp.124–137.

Legris, P., Ingham, J. and Collerette, P. (2003) 'Why do people use information technology? A critical review of the technology acceptance model', *Information & Management*, Vol. 40, No. 3, pp.191–204.

Leong, L.Y., Ooi, K.B., Chong, A.Y.L. and Lin, B. (2011) 'Influence of individual characteristics, perceived usefulness, and ease of use on mobile entertainment adoption', *International Journal of Mobile Communications*, Vol. 9, No. 4, pp.359–382.

Lin, A. and Chen, N.C. (2012) 'Cloud computing as an innovation: perception, attitude, and adoption', *International Journal of Information Management*, Vol. 32, No. 6, pp.533–540.

London, B., Downey, G. and Mace, S. (2007) 'Psychological theories of educational engagement: a multi-method approach to studying individual engagement and institutional change', *Vand. L. Rev.*, Vol. 60, p.455.

Madan, K. and Yadav, R. (2016) 'Behavioural intention to adopt mobile wallet: a developing country perspective', *Journal of Indian Business Research*, Vol. 8, No. 3, pp.227–244.

Magrath, V. and McCormick, H. (2013) 'Marketing design elements of mobile fashion retail apps', *Journal of Fashion Marketing and Management: An International Journal*, Vol. 17, No. 1, pp.115–134.

Maslach, C., Schaufeli, W.B. and Leiter, M.P. (2001) 'Job burnout', *Annual Review of Psychology*, Vol. 52, No. 1, pp.397–422.

Mayer, R.C., Davis, J.H. and Schoorman, F.D. (1995) 'An integrative model of organizational trust', *Academy of Management Review*, Vol. 20, No. 3, pp.709–734.

McKnight, D.H., Choudhury, V. and Kacmar, C. (2002) 'Developing and validating trust measures for e-commerce: an integrative typology', *Information Systems Research*, Vol. 13, No. 3, pp.334–359.

McLean, G. (2018) 'Examining the determinants and outcomes of mobile app engagement – a longitudinal perspective', *Computers in Human Behavior*, Vol. 84, pp.392–403.

Morgan, R.M. and Hunt, S.D. (1994) 'The commitment-trust theory of relationship marketing', *Journal of Marketing*, Vol. 58, No. 3, pp.20–38.

Nunnally, J.C. and Bernstein, I.H. (1994) *Psychometric Theory (McGraw-Hill Series in Psychology)*, Vol. 3, McGraw-Hill, New York.

O'Brien, H.L. and Toms, E.G. (2010) 'The development and evaluation of a survey to measure user engagement', *Journal of the American Society for Information Science and Technology*, Vol. 61, No. 1, pp.50–69.

Pagani, M. and Mirabello, A. (2011) 'The influence of personal and social-interactive engagement in social TV web sites', *International Journal of Electronic Commerce*, Vol. 16, No. 2, pp.41–68.

Pandi, A.P., Sethupathi, P.R., Jeyathilagar, D. and Rajesh, R. (2016) 'Structural equation modelling for analysing relationship between IEQMS criteria and performance of engineering institutions', *International Journal of Enterprise Network Management*, Vol. 7, No. 2, pp.87–97.

Perumal, M.C., Sulochana, C.H. and Moorthy, T. (2015) 'A unifying framework for seamless handover across mobile telecom network', *International Journal of Enterprise Network Management*, Vol. 6, No. 3, pp.238–250.

Preacher, K.J. and Hayes, A.F. (2008) 'Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models', *Behav. Res. Methods*, Vol. 40, No. 3, pp.879–891.

Ramayah, T. and Lo, M.C. (2007) 'Impact of shared beliefs on 'perceived usefulness' and 'ease of use' in the implementation of an enterprise resource planning system', *Management Research News*, Vol. 30, No. 6, pp.420–431.

Reichheld, F.F. and Schefter, P. (2000) 'E-loyalty: your secret weapon on the web', *Harvard Business Review*, Vol. 78, No. 4, pp.105–113.

Ringle, C.M., Wende, S. and Becker, J.M. (2015) 'SmartPLS 3. SmartPLS GmbH, Boenningstedt', *Journal of Service Science and Management*, Vol. 10, No. 3.

Ringle, C.M., Wende, S. and Will, A. (2005) *SmartPLS 2*, SmartPLS, Hamburg.

Rogers, E.M. (1995) *Diffusion of Innovations*, p.12, Free Press, New York.

Rogers, E.M. (2002) 'Diffusion of preventive innovations', *Addictive Behaviors*, Vol. 27, No. 6, pp.989–993.

Rogers, E.M. and Shoemaker, F. (1983) *Diffusion of Innovation: A Cross-Cultural Approach*, Free Press, New York, NY.

Rose, S., Clark, M., Samouel, P. and Hair, N. (2012) 'Online customer experience in e-retailing: an empirical model of antecedents and outcomes', *Journal of Retailing*, Vol. 88, No. 2, pp.308–322.

Saks, A.M. (2006) 'Antecendent and consequences of employee engagement', *Journal of Managerial Psychology*, Vol. 21, No. 7, 600–619.

Sarstedt, M., Ringle, C.M. and Hair, J.F. (2017) 'Partial least squares structural equation modeling', in Homburg, C., Klarmann, M. and Vomberg, A. (Eds.): *Handbook of Market Research*, Springer, Heidelberg.

Schaufeli, W.B., Salanova, M., González-Romá, V. and Bakker, A.B. (2002) 'The measurement of engagement and burnout: a two sample confirmatory factor analytic approach', *Journal of Happiness Studies*, Vol. 3, No. 1, pp.71–92.

Shaw, N. (2014) 'The mediating influence of trust in the adoption of the mobile wallet', *Journal of Retailing and Consumer Services*, Vol. 21, No. 4, pp.449–459.

Shaw, N. (2015) 'The mediating role of perceived security: an empirical study of mobile wallet adoption in USA', in *International Conference on HCI in Business*, Springer, Cham, August, pp.358–369.

Shivers-Blackwell, S.L. and Charles, A.C. (2006) 'Ready, set, go: examining student readiness to use ERP technology', *Journal of Management Development*, Vol. 25, No. 8, pp.795–805.

Slade, E., Williams, M., Dwivedi, Y. and Piercy, N. (2015) 'Exploring consumer adoption of proximity mobile payments', *Journal of Strategic Marketing*, Vol. 23, No. 3, pp.209–223.

So, K.K.F., King, C. and Sparks, B. (2014) 'Customer engagement with tourism brands: Scale development and validation', *Journal of Hospitality & Tourism Research*, Vol. 38, No. 3, pp.304–329.

Srinivasan, S.S., Anderson, R. and Ponnavolu, K. (2002) 'Customer loyalty in e-commerce: an exploration of its antecedents and consequences', *Journal of Retailing*, Vol. 78, No. 1, pp.41–50.

Tam, K.Y. and Ho, S.Y. (2005) 'Web personalization as a persuasion strategy: an elaboration likelihood model perspective', *Information Systems Research*, Vol. 16, No. 3, pp.271–291.

Tang, B., Bragazzi, N.L., Li, Q., Tang, S., Xiao, Y. and Wu, J. (2020) 'An updated estimation of the risk of transmission of the novel coronavirus (2019-nCov)', *Infectious Disease Modelling*, Vol. 5, pp.248–255.

Venkatesh, V., Thong, J.Y. and Xu, X. (2012) 'Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology', *MIS Quarterly*, Vol. 36, No. 1, pp.157–178.

Vivek, S.D., Beatty, S.E. and Morgan, R.M. (2012) 'Customer engagement: exploring customer relationships beyond the purchase', *Journal of Marketing Theory and Practice*, Vol. 20, No. 2, pp.122–146.

Vrechopoulos, A., Constantiou, I., Sideris, I., Doukidis, G. and Mylonopoulos, N. (2003) 'The critical role of consumer behaviour research in mobile commerce', *International Journal of Mobile Communications*, Vol. 1, No. 3, pp.239–340.

Webster, J. and Watson, R.T. (2002) 'Analyzing the past to prepare for the future: writing a literature review', *MIS Quarterly*, Vol. 26, No. 2, pp.xiii–xxii.i.

Wold, H. (1975) 'Path models with latent variables: the NIPALS approach', in *Quantitative Sociology*, pp.307–357, Academic Press, USA.

Yun, H., Han, D. and Lee, C.C. (2013) 'Understanding the use of location-based service applications: do privacy concerns matter?', *Journal of Electronic Commerce Research*, Vol. 14, No. 3, p.215.

Zolkepli, I.A. and Kamarulzaman, Y. (2015) 'Social media adoption: the role of media needs and innovation characteristics', *Computers in Human Behavior*, Vol. 43, pp.189–209.