

# Consumer Trust in Mobile Payments: An Initial Review and Synthesis

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## Abstract

Modes of trading and commerce have vastly grown and developed in the past decade from a singular-focused center to a numerous channel approach, with mobile devices and technology playing increasingly important role in the latest developments. Professionals in the field now believe that mobile payment systems will become the system of choice for payments, owing to its high diffusion level in society, ease of use, and accessibility. In this initial study of consumer trust in mobile payments, we perform a review of 30 peer-reviewed journal articles on consumer trust in mobile payments published from 2010-2018. Using an established analytical framework, we evaluate the research focus, research approach, and theoretical foundation in each of these papers. Based on the themes and trends that emerge from this existing literature, we identify gaps and opportunities for future research.

## Introduction

A report from the International Telecommunication Union released in 2010 revealed that based on the then current growth rate, mobile web access would likely exceed web access from desktop computers within five years. In January 2014, just four years after this bold prediction, mobile internet use exceeded desktop use in the United States. This evolution and rapid growth of mobile web since 2007 has led to significant changes in contemporary society, forcing organizations to adapt their customer-based services to the burgeoning mobile technology phenomenon.

According to Liébana-Cabanillas et al. (2017), a study conducted by MasterCard and Prime Research (2014) on mobile payments in 56 markets and 26 languages in North and South America, Europe, Africa, Asia, and the countries in the Pacific Rim revealed a positive attitude toward mobile payment and a rapid growth in use among consumers and in acceptance by businesses. 88% of the monitored conversations between businesses were positive and many even saw acceptance of mobile payments as a competitive advantage.

Mobile payments are the payments and transactions carried out between two parties in a rapid, convenient, secure, and simple way, at any time and from any location through a mobile phone (Liébana-Cabanillas et al. 2017) or other portable devices. Mobile payments require a mobile device to “initiate, authorize and/or

confirm an exchange of financial value” that can replace payments made with cash, check or payment cards (Zhong, 2009, p. 80). Furthermore, mobile payments do not restrict themselves to payments via a mobile phone (Karnouskos and Vilmos, 2004) as a mobile payment is based upon a portable device that has the relevant technology with wireless capability to transfer money electronically between two parties (Bourreau and Verdier, 2010; Turowski and Pousttchi, 2004). As a result, this includes Europay, MasterCard and VISA (EMV) contactless smart cards, although similar terms like proximity or remote payments are also used. Mobile payment is considered by many experts as one of the applications with the greatest potential in the business sector related to mobile telephony (Slade et al. 2013; Hu et al. 2008).

An important facet of mobile payment, however, is consumer trust. Trust has received considerable attention in the electronic commerce context due to the great uncertainty and risk involved in online transactions (Harris et al., 2016; Gao and Waechter, 2017). Zhou (2014) posits that trust often includes three dimensions: ability, integrity and benevolence. Ability means that service providers have the knowledge and expertise necessary to fulfill their tasks. Integrity means that service providers keep their promises and do not deceive users. Benevolence means that service providers are concerned with users’ interests, not just their own benefits. Thatcher et al. (2013) distinguished trust as general trust and specific trust. General trust includes trust in IT infrastructure and trust in institutional mechanisms; specific trust includes trust in merchant and trust in website. Taken together, trust in the e-service context can thus be defined as a consumer’s confidence in and willingness to depend on the:

- (1) e-service provider’s reliability, good intentions, and ability to deliver on expectations;
- (2) product or delivered service to meet the consumer’s needs;
- (3) e-service website or platform to perform the required functions; and
- (4) integrity and dependability of the enabling technological environment (Mou et al. 2017).

Trust has been found to affect user adoption of various services, such as internet banking (Susanto et al. 2013), online social networks (Wu et al. 2014a, 2014b) and mobile shopping (Harris and Chin, 2016; Yang 2015). Batiz-Lazo et al., (2016) described trust as the belief of the trustor that the trustee will fulfil the trustor’s expectations without taking advantage of the trustor’s vulnerabilities. In the online transaction scenario, McKnight et al. (2002) conceptualize trust as the belief which allows consumers to willingly become vulnerable to online vendors for an expected service after duly considering the vendor characteristics.

Trust in the organization providing mobile payments is a key determinant of success (Harris et al., 2015; Xu and Gutierrez, 2006) and includes banks, card companies, mobile network operators (MNOs) and other payment service providers (Kim et al., 2010). Consumer trust in a mobile payment provider is critically influenced by the organization’s reputation (Anderson and Weitz, 1989). In addition, a positive reputation of an organization increases consumer trust in the absence of any first-hand knowledge or experience (Harris et al., 2015; Lohse and Spiller, 1998). Trust in a mobile payment organization is a key factor in the consumer decision-making process (Gefen et al., 2003). However, the impact of trust is higher than that of perceived risk, particularly in consumer decisions on payment transactions that are perceived as higher risk (Chin et al., 2018; Roy and Shekhar, 2010).

In this study, we perform a review of 30 journal papers on consumer trust in mobile payments. These peer-reviewed journal papers were published between 2010 to 2018. For each of these manuscripts, we examine the research focus, research approach, and theoretical foundation presented. Based on our analysis of these works, we identify themes and trends that are prevalent in the extant literature. Finally, we identify gaps in the existing literature on consumer trust in mobile payments and propose opportunities for future research in this area. The research questions that we ask in this study are:

RQ1: What are the prevailing themes and trends in the recent research?

RQ2: What gaps and opportunities for future research can be identified?

The remainder of the paper is structured as follows. Following a discussion of the background for this study, our research methodology and analytical framework is explained. Our results are presented, followed by a discussion and conclusion.

## **Background**

Gao and Waechter, (2017) proposed and tested an initial trust theoretical model for user adoption of mobile payment systems. Their model not only theorizes the role of initial trust in mobile payment adoption, but also identifies the facilitators and inhibitors for a user's initial trust formation in mobile payment systems. They concluded that perceived information quality, perceived system quality, and perceived service quality as the initial trust facilitators are positively related to initial trust formation, while perceived uncertainty as the initial trust inhibitor exerts a significant negative effect on initial trust.

Lu et al. (2011) used structural equation modeling (SEM) to empirically investigate whether a customer's established trust in internet payment services is likely to influence his or her initial trust in mobile payment services. They also examined how these trust beliefs might interact with both positive and negative valence factors and affect a customer's adoption of mobile payment services. Their SEM analysis indicated that trust indeed had a substantial impact on the cross-environment relationship and, further, that trust in combination with the positive and negative valence determinants directly and indirectly influenced behavioral intention. Here, positive valence are factors that will motivate the consumer to adopt mobile payments while negative valence are factors that will demotivate the consumer from adopting mobile payments.

Ha et al. (2012) expressed that while numerous studies have investigated the drivers of mobile banking adoption, no study has critically reviewed the findings of previous efforts and evaluated the ramifications for researchers or practitioners. As a consequence, their research explores the most commonly used drivers to examine the adoption of mobile banking through a comprehensive literature review of articles published between 2008 and 2011. They concluded that the Technology Acceptance Model (TAM) was mainly adapted by most mobile banking studies and that the most common drivers of adoption can be categorized into four major dimensions, i.e. perceived usefulness, perceived risk, perceived compatibility and perceived cost. Trust was listed sixth (6th) on their list of seventeen (17) most common drivers of adoption.

While a few works on consumer trust in mobile payments can be found in the previous literature, there exists a notable scarcity. In particular, there is an infrequency of research that juxtapositions consumer trust with the adoption and continued use of mobile payment systems. Also, research is noticeably absent from South American countries and African countries. In the collection of manuscripts that we reviewed, none had sourced data from any South American country, therefore, we were unable to gauge how mobile payment is being adopted, and more specifically, the role and impact of consumer trust in the adoption of mobile payment, in that part of the world. There is also an infrequency of research in the current forms of mobile payment such as Near Field Communication (NFC) payment systems that are based on proximity technology, biometric fingerprint payment systems, voice payment systems, etc. Finally, the majority of the literature that we reviewed did not focus on any specific type of mobile payment system.

## **Methodology**

The methodology implemented in this paper is structured literature review (SLR). This methodology of reviewing and categorizing relevant literature is essential in advancing the knowledge in specific areas of interest (Boehm, 2013), facilitating the development of new theories (Webster and Watson, 2002), identifying gaps in the collective published knowledge bank (Roztocki et al., 2015), and discovering opportunities for future research endeavors (Urbach et al, 2009).

In order to identify the articles that were relevant for our study, we conducted a literature search of previously published works. We queried electronic library databases including Science Direct, ISI Web of

Science, ACM Digital Library, Scopus, Emerald, Springer, Taylor & Francis, EBSCO, and JSTOR, with related keywords such as consumer trust, mobile payment, mobile payment adoption, and trust mobile payment. The reference section of identified articles was also used to identify more articles. Conference papers that were found during the search were exempted from this review. Only peer-reviewed journal papers were included. We uncovered a plethora of literature in interrelated areas and subjects, such as mobile banking, m-banking and internet banking, however, these were excluded from the present study.

Based on our search criteria, we identified 30 relevant papers published from 2010 to 2018, as shown in Table 1 below:

Table 1. Papers by Journal and Year

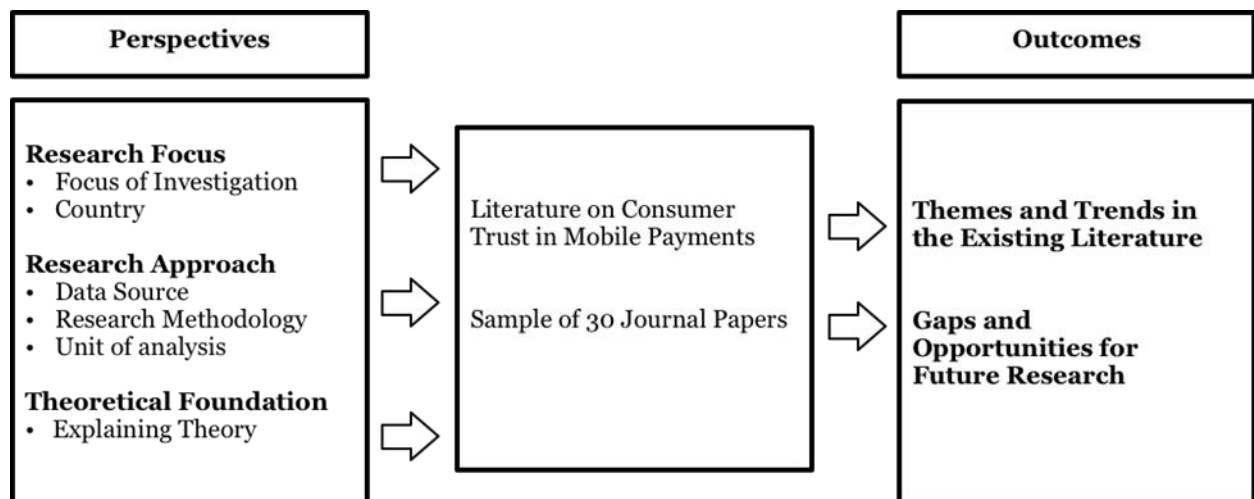
No	Journal	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
1	Computers in Human Behavior	2		1		1	1	1	1		7
2	Decision Support Systems			1							1
3	Electronic Commerce Research								1		1
4	Electronic Commerce Research and Applications						1	2			3
5	Emerging Markets Journal							1			1
6	Expert Systems and Applications				1						1
7	Industrial Management and Data Systems					1					1
8	Information and Management		1								1
9	Information Systems Frontiers								1		1
10	Information Technology Management					1					1
11	International Journal of Bank Marketing								1		1
12	International Journal of Information Management								1		1
13	Journal of Computer Information Systems						1		1		2
14	Journal of Enterprise Information Systems						1				1
15	Journal of Retailing and Consumer Services						1	1			2
16	Journal of Strategic Marketing						1				1
17	Psychology and Marketing						1				1

18	Service Business									1	1
19	Technological Forecasting and Social Change							1			1
20	Wireless Personal Communication					1					1
	Total	2	1	2	1	4	7	5	7	1	30

As shown in Table 1, the 30 articles appeared in 20 prominent journals in information systems. However, the majority of the articles appeared from 2014-2018, indicating that research relating to consumer trust in mobile payments was rather sparse in previous years but has gained some traction only in the past 5 years. A mere 6 of the 30 articles were published between 2010-2013 and appeared in only 4 of the 20 journals. Even within the 20 identified journals, only 4 journals published more than one manuscript relating to consumer trust in mobile payments over the past nine years. *Computer in Human Behavior* was the most popular outlet, followed by *Electronic Commerce Research and Applications*, *Journal of Computer Information Systems*, and *Journal of Retailing and Consumer Services*.

To review and analyze the compiled manuscripts, we adopted a variation of the research framework presented in Roztocki et al. (2015) and shown below in Figure 1. We manually categorized the papers based on three perspectives, namely, the research focus, research approach, and theoretical foundation. The research focus identified the focus of investigation identified in each manuscript and the country or region where the study was conducted. The research approach included the source of data that was used for data collection, the research methodology that was used for analysis of the gathered data, and the granularity of analysis that was used. Finally, the theoretical foundation evaluated the theoretical model that was applied in each of the selected papers

Figure 1. Analytical Framework – Perspectives and Outcomes (Roztocki et al., 2015)



## Results

### Research Focus

To evaluate the research focus of our basket of papers, we evaluated the focus of investigation for each paper as well as the country or region where the study was conducted. As shown in Tables 2 and 3, only 16 countries were represented in the collection of analyzed papers, indicating that research in consumer trust in mobile payments is geographically very limited. Table 3 shows that the majority of the research was conducted in China, followed by the UK, Spain, Malaysia (one manuscript was included in the count twice because it included data from both China and Malaysia), and Korea. The remaining 11 countries were represented in only one publication. South American countries and African countries were not represented in any of the papers, indicating a clear dearth of research on consumer trust in mobile payments from these parts of the world.

Table 2. Analysis of Papers

No	Author	Focus of Investigation	Country/Region	Data Source	Research methodology	Unit of Analysis	Acceptance / Adoption model used
1	Cabanillas and Rubio 2017	Merchant Adoption of Mobile Payment Systems	Spain	Focus Groups, Questionnaire, Interviews	Logistic Regression Model, Artificial Neural Networks Model	Multiple Organization	None
2	Cabanillas, Fernandez and Leiva 2014	Impact of age on acceptance of mobile payment systems	Spain	Questionnaire	Structural Equations Modeling	Country	TAM
3	Cabanillas, Leiva and Fernandez 2018	Use of VSN and SMS as payment system	Spain	Interview, Questionnaire	Structural Equations Modeling	Country	Mobile Payment Model (MPM)
4	Cabanillas, Marinkovic and Kalinic 2017	Determine factors that influence consumer adoption of m-commerce	Serbia	Focus Group, Questionnaire	Structural Equations Modeling, Neural Networks	Country	None
5	Chen and Li 2017	Factors influencing users' continued use of mobile payment service	China	Interview	Covariance-based structural equation modeling (CBSEM)	Organization	Information Technology Continuance Theory (ITC)
6	Chong, Chan and Ooi 2012	Predicting consumer intention to adopt m-commerce	China, Malaysia	Questionnaire	Hierarchical Regression Analysis	City	TAM, DOI
7	Dahlberg, Guo and Ondrus 2015	Review of published research in m-payment	None	Electronic Search	Derivation of Contingency Theory	None	None

8	Dastan and Gurler 2016	Factors affecting mobile payment adoption	Turkey	Questionnaire	Structural Equation Modeling	Organization	TAM
9	Gao and Waechter 2017	Role of Initial trust in m-payment adoption	Australia	Questionnaire	Partial Least Squares Structural Equation Modeling	Organization	Valence Framework, ISS Model, TCE Model
10	Hampshire 2017	Consumers perception of trust, risk and usefulness of m-payments	UK	Questionnaire, Interview	Exploratory Sequential mixed methods	City	TAM
11	Hillman and Neustaedter 2017	How trust affect m-commerce	Canada	Semi-structured interview	None	Project	None
12	Kerviler, Demoulin and Zidda 2016	Consumer's adoption of proximity m-payment technology	France	Questionnaire	Exploratory and Confirmatory Factor Analysis	Organization	Theory of Perceived Value (TPV)
13	Kim, Mirusmonov and Lee 2010	Factors affecting the use of m-payment	Korea	Questionnaire	Structural Equations Modeling	Multiple Organizations	TAM
14	Koster, Matt and Hess 2016	Payment provider reputation and its influence on m-commerce transaction	Germany	Questionnaire	Two Way Multivariate Analysis of Variance	City	2x2 between-subjects design experiment
15	Leong, Hew, Tan and Ooi 2013	Factors affecting adoption of NFC m-credit card	Malaysia	Questionnaire	Structural Equation Modeling, Artificial Neural Network	State	TAM
16	Li and Yeh 2010	Increase trust through design aesthetics	Taiwan	Questionnaire	Structural Equation Modeling	Multiple Organizations	Modified TAM
17	Lin, Wang, Wang and Lu 2014	Longitudinal evolution of trust in m-payment over time	China	Questionnaire	Partial Least Squares	State	Extended Valence Theory, Self-Perception Theory, IS Expectation Confirmation Theory
18	Lu, Yang, Chau and Cao 2011	Influence of established trust on internet payment on initial trust in m-payment	China	Questionnaire	Structural Equation Modeling	Country	Valence Framework, Trust transfer theory
19	Mou, Shin and Cohen 2017	Meta-analytical effects of trust and risk on consumer acceptance of e-services	None	Electronic Search	Meta-analytic Structural Equation Modeling (MASEM)	None	None
20	Nilashi, Ibrahim, Mirabi, Ebrahimi	How security, design and content factors influence consumer trust in m-commerce	Malaysia	Questionnaire	Principal Component Factor Analysis, Exploratory Factor Analysis	Project	Analytic Network Process, Fuzzy Logic

	and Zare 2015						
21	Oliveira, Thomas, Baptista and Campos 2016	Factors that influence the intention to adopt and to recommend m-payment	Portugal	Questionnaire	Structural Equation Modeling	Organization	UTAUT2, DOI
22	Rouibah, Lowry and Hwang 2016	The role of perceived enjoyment on trust in the presence of risk perception	Kuwait	Questionnaire	Partial Least Square Regression	Organization	Cognitive Dissonance Theory
23	Slade, Dwivedi, Piercy and Williams 2015	Factors affecting nonusers' intention to use remote mobile payment	UK	Questionnaire	Structural Equation Modeling	Organizations	UTAUT
24	Slade, Williams, Dwivedi and Piercy 2015	Factors affecting nonuser's intention to use NFC mobile payment	UK	Questionnaire	Factor Analysis, Principal Component Analysis	Organizations	UTAUT2
25	Upadhyay and Chattopadhyay 2015	Unified approach in identifying factors influencing usage intention of m-payment	India	Questionnaire	Growing Hierarchical Self-organizing Map (GHSOM)	Country	GHSOM
26	Xin, Techatassana soontorn and Tan 2015	Role of trust in consumer's intention to adopt m-payment	New Zealand	Questionnaire	Partial Least Squares, Structural Equation Modeling	Organizations	Custom
27	Yang, Pang, Liu, Yen and Tarn 2015	Consumer perceived risk and trust in online payments	China	Questionnaire	Structural Equation Modeling	Organizations	TRA, TPB, TAM and DTPB
28	Zhang, Zhu and Liu 2012	Meta-analysis of published research in m-payment	None	Electronic Search	Structural Equation Modeling	None	TAM
29	Zhou 2014b	Factors affecting continuance usage of mobile payment	China	Questionnaire	Confirmatory Factor Analysis, Structural Equations Modeling	Multiple Organization	Unspecified
30	Zhou 2014a	Determinants of initial trust in mobile payment	China	Questionnaire	Structural Equation Modeling	Organization	Custom

Table 3. Country Representation

Country/Region	Count
Australia	1
Canada	1
China	7
France	1
Germany	1
India	1
Korea	1



Kuwait	1
Malaysia	3
New Zealand	1
Portugal	1
Serbia	1
Spain	3
Taiwan	1
Turkey	1
UK	3
Unspecified	4
Total	30

### Research Approach

To evaluate the research approach of our selected papers, we investigated the source of data that was used in each manuscript as well as the research methodology and the granularity level. As shown in Table 4, almost all (22) of the published results stem from survey data. Even when interviews were used to gather data, these were typically coupled with questionnaire data, with only one manuscript using only interviews and one using semi-structured interviews for data collection. Focus groups, while infrequent, were also used in two studies. Electronic searches were used in 3 studies for literature reviews centering on mobile payments.

Table 4. Data Collection Method

Data Collection Method	Count
Electronic Search	3
Focus Group, Questionnaire	1
Focus Groups, Questionnaire, Interviews	1
Interview or Semi-Structured interview	2
Interview, Questionnaire	2
Questionnaire	21
Total	30

Structural equation modeling (SEM) proved to be the most prevalent research methodology (10) with partial least squares (5) and neural networks analysis (2) also being popular. Several papers used a combination of these methodologies. Factor analysis, regression, and other methodologies were also used, albeit infrequently.

Investigating the granularity of each study, we found that the majority of studies concentrated on an organization (10), with four studies including multiple organizations in their work (see Table 5). Two studies were specifically project-based while 5 studies included a scope of a city or state. Only 6 studies had a countrywide focus with no studies crossing national borders. It is particularly important to assess the impact of consumer trust in mobile payment systems from an international perspective as the ubiquity of the internet has fueled the volume of ecommerce transactions, not just in business-to-business interactions but also at the consumer level through outlets such as online auction houses as well as other online transactions. However, none of the analyzed manuscripts incorporated any multinational or multicultural analyses.

Table 5. Unit of Analysis

Unit of Analysis	Count
City/State	5
Country	6
(Multi) Organization	14
Project	2
None	3
<b>Total</b>	<b>30</b>

### ***Theoretical Foundation***

When evaluating theoretical foundation, we scoured the papers to determine the explaining theory that was used in the analysis, as a basis for the research methodology, or as the foundation for the results. Six papers did not specify a particular explaining theory and were therefore excluded from our analysis. Of the remaining 24 papers, 9 papers based their work on the Technology Acceptance Model (TAM) proposed by Davis (1989) which attempts to understand user intentions with regard to the use and acceptance of a technology, where users are influenced by two major constructs: the perceived usefulness of the technology and perceived ease of use of the technology. Three other papers made use of the Unified Theory of Acceptance and Use of Technology (UTAUT) proposed by Venkatesh et al. (2003), which includes four core determinants for intention and usage of technology. The valence framework (Peter, 1975), which combines perceived risk and perceived benefit as important components of consumer decision-making was also considered in 3 papers. Finally, 2 studies used the Diffusion of Innovation (DOI) model (Rogers, 1995) that attempts to explain how novel products or practices are adopted by a user community.

### **Conclusion and Limitations**

#### ***Themes and Trends in the Existing Literature***

Based on our analysis of the previous literature, we can identify some themes and trends that have emerged. First, research in mobile payments is general in nature and does not focus on particular types of mobile payment systems. Only three papers even specified the type of mobile payment under consideration -- two evaluated proximity mobile payments and one paper studied remote mobile payments. Second, trust, risk, perceived ease of use and perceived usefulness are the most common adoption factors that researchers study. Only three papers focused on other factors such as design aesthetics, interface design quality, and content factors. Third, most research is limited to only a handful of countries, hence, lacking a global perspective. South American countries and African countries were not represented in any of the papers. Given the vast proliferation of ecommerce across national borders, including ecommerce transactions between consumers, and the resulting need for electronic payments combined with the omnipresence of

mobile devices, studies regarding mobile payments that encompass international markets and cultural nuances are poignantly needed.

### **Gaps and Opportunities for Future Research**

Research on mobile payments and specifically on issues of consumer trust concerning mobile payment systems is in a state of infancy, having gained traction in only the past several years. One obvious gap in the existing literature that has emerged from our analysis is that of geographic breadth. Existing research is limited to a handful of nations, with China having the greatest representation. Future research stemming from multiple countries around the world and research that incorporates data from multiple countries could provide great insights on the usage and acceptance of mobile payment systems. In particular, it would be interesting to incorporate cultural norms from a multitude of cultures into the analysis.

Another avenue for future research is to focus on specific type of mobile payment systems. Since most previous research is generalized, future research opportunities exist in evaluating specific areas such as proximity technologies like NFC payments, RFID payments, biometric fingerprint payments, and voice payments. Previous researchers seem to be lax in identifying the different types of mobile payment systems, the category they belong to, and the technology behind them. Consequently, a clear need exists for studies that methodically define and develop a proper categorization of all of the forms of mobile payment systems that are available.

Another avenue for future research includes data collection on usage patterns. Previous research has largely been based on analysis of survey data at a particular instance in time. Studies that tabulate actual consumer behavior when engaging in mobile payments, along with the facets that contribute to such behavior could have interesting ramifications for practitioners. Furthermore, data collected on actual usage patterns over time could shed light on consumer tendencies for continued usage of mobile payment systems as well as provide input on consumer attitudes and have practical implications on the development and characteristics of future mobile payment systems.

### **Limitations**

As with all research, the present study has some limitations. First, the analysis in this study is based on a sample size of only 30 papers. While this sample size is sufficient for this initial study, a larger and more exhaustive study could yield more detailed information on recent themes and trends. Additionally, our analysis was limited to papers from peer-reviewed journals. A future research study that includes conference proceedings, reports, and other works may provide an even more enhanced understanding of the research landscape. Finally, future research may include an analysis of additional perspectives beyond research focus, research approach, and theoretical foundation as evaluated in this work.

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### **Appendix (List of 30 Papers in our Sample)**

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