Theoretical Grounding of Perceived Risk in Adoption of Mobile Payment System and Behavioural Intention

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A B S T R A C T

This study focuses on a better understanding of the importance of risk perception in adopting Mobile Payment Systems (MPS) by conducting a systematic literature review. From the social science field (using Scopus and Web of Science database) articles were selected. Overall, forty-four significant pieces were determined using a systematic methodology. In addition to providing a summary of the most used theories used to address perceived risk in MPS this paper also investigates the definition for the perceived risk in MPS literature. The study is performed through the identification of dominant theories used to explain perceived risk in the literature. The article gives a thematic analysis of theories and the relation of perceived risk with behavioural intention. As far as we know, this is the first effort of its kind to give a holistic, systematic literature review in light of perceived risk in MPS. Consequently, it is a crucial first step in establishing a solid theoretical framework involving the constructs of perceived risk and laying the groundwork for future research in this area.

Keywords: M-payment, Mobile payment, Perceived risk, Theoretical grounding, E-payment

Ⅰ. Introduction

Mobile phones have proliferated our lives in the last couple of years. The mobile phone utility has increased significantly with the advent of smartphones and the developments of high-speed internet services. This development in mobile telephony and information and communication technologies (ICT) have influenced the way we communicate and has significantly influenced how we conduct commercial transactions in our daily lives (Bauer, 2005; Chhonker et al., 2017; Chhonker et al., 2018; Hsy and Kulviwat, 2006; Vaeshney and Vetter, 2002). Consumers demand MPS by adopting and using specific services, and a quality amount of research has been dedicated to investigating various adoption factors (Hedman

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et al., 2017; Williams, 2018). However, like any other new technology-based solution, it has also come under the scanner of perceived risk. In consumer behaviour, perceived risk has been studied for a long and it has been years since it came from novice to expert. A wide range of areas have been used to study perceived risk, including intercultural comparisons (Alcántara-Pilar et al., 2013), Banking (Makanyeza, 2017) and Online Shopping (Lim, 2003). Bauer (1960 b) first introduced that customer attitude might be used as an indication of risk-taking; he modestly assumed that the "trend" he was likely to raise would at least withstand infancy. Contemporary years have shown a significant boost in the number of journals publishing quantitative research in this field, and current consumer behaviour models or theories extensively implement perceived risk construct (Johnson et al., 2018; Kim et al., 2010).

MPSs (MPS) are fast emerging as preferred payment options due to their comfort and efficiency in making payments or fund transfers (Mallat et al., 2004). The ubiquitous presence of smart mobile devices capable of providing varied services anywhere, anytime (Liang et al., 2007) has presented a strong case favouring its development as a platform for cashless transactions (Pham and Ho, 2015). A recent industry report pegs mobile payments market at US $139.40 billion in 2019 (Mordor, 2020), which it estimates to grow at a CAGR of 26.93% to US $4690.65 billion in 2020-25 (ibid). Adoption behaviour related to MPS has recently drawn many researchers' attention (Hedman et al., 2017; Williams, 2018). While some researchers have focused on intercultural comparisons (Alcántara-Pilar et al., 2013), Banking (Makanyeza, 2017), some have studied Online Shopping (Lim, 2003). Researchers have also studied the adoption of MPS in various industries, such as Ozturk, 2016 studied consumer acceptance

of cashless payment in the hospitality industry. Security-related factors were discussed in the restaurant industry by Khalilzadeh et al. (2017), and e-commerce was explored by (Cocosila and Trabelsi, 2016). It has been argued that compared to adoption studies, non-adoption issues have been paid lesser attention (Gong et al., 2020) as non-adoption was considered more of the opposite of adoption (Bunduchi et al., 2015) and thus were ignored. However, due to growing acceptance that there can be different reasons that influence the favourable and non-favourable perception of technology and therefore intention to adopt (Laukkanen, 2016), there are studies that address issues related to non-adoption in IS research domain

One area that deserves special attention to the non-adoption behaviour of any technology is the study of associated user perceived risk with risk perceptions negatively related to behaviour (Kim et al., 2008). Perceived risk also has been considered for various innovation adoption for payment systems such as internet shopping (Williams, 2018), e-services (Featherman and Pavlou, 2003), whereas despite the availability of various MPS providers, the adoption rate among vendors is still lower (Dahlberg et al., 2008). Therefore, there is a need to examine what apprehends vendors from adopting MPS. Some studies focus on consumer involvement and perceived risk from consumer's perspective (Mallat, 2007; Wu et al., 2017), whereas a handful of papers were found regarding Vendor/Merchant's Perspective and perceived risk (Ghezzi et al., 2010; Tan et al., 2014; Tiago et al., 2016).

Secondly, prior literature on MPS was primarily focused on investigating the motivation behind adoption by using various IS adoption theories, such as Unified theory of acceptance (UTAUT), Technology Acceptance Model (TAM) theory of reasoned action

(TRA) etc. (Liébana-Cabanillas et al., 2014b; Schierz et al., 2010a; Slade et al., 2015).

In the Scopus database, a total of 1854 articles about MPS were found, out of which 27 research articles were review papers. None of these papers reviewed theories associated with research on perceived risk concerning MPS. According to the survey, TAM is used in the majority of MPS publications. Thus this study is a starting step towards gaining a better grasp of theoretical grounding underlying MPS and PR dynamics. Another issue raised by this research is that some theories (TAM and UTAUT) have received more attention than others. This demonstrates the need to discover the reasons behind the phenomenon and uncover the latent areas of research in the domain.

In the information system literature, acceptance/adoption and usage of information technology (IT) research is considered a mature field (Hu and Bentler, 1999). Researchers still struggle to choose the right model or structures from a profusion of models while deciding whether or not to accept new technology. To comprehend and forecast the confirmed predictors of IT acceptance/adoption and usage, many theoretical models from diverse disciplines like psychology, sociology, and marketing have been applied, changed, and merged rationally throughout the years (Venkatesh and Bala, 2008). Since there were so many theories and models, researchers had difficulty selecting the suitable model for their goals. It looks as though the chosen model is oblivious of the contributions of the other models. It is not essential for the constructs inside a chosen model to perform equally in prior research to be considered valid and reliable. Therefore, selecting a particular model may result in overflow and under flux circumstances throughout the analysis if chosen incorrectly. Bagozzi (1992) describes overflow situations as the

polar opposite of parsimonious conditions. It also causes problems understanding path relationships within the model. Constructions within a single model may fail to produce the anticipated significant effect, resulting in an underflow scenario. Selecting numerous structures from various models and integrating them into an expanded model is one possible solution to this challenge. When it comes to picking ideas and constructs that have a solid theoretical basis, however, the task might be daunting (Viswanath Venkatesh and Bala, 2008). As a result, the researcher purposefully evaluated various models and their constructs as part of a systematic literature review to choose and identify the most researched theory/model in terms of MPS and perceived risk.

Therefore, a comprehensive review of perceived risk in MPS offers the potential to derive how MPS could be marketed more efficiently, leading to greater acceptance among vendors. The contribution of our study has both theoretical and practical dimensions. Theoretically, this may contribute to the prevailing body of literature by offering additional insight into the theories utilised in the literature of MPS i.e., relationship between MPS and behavioural intention. w.r.t different theories. Besides this, our paper also presents some significant statistical findings of the literature. Practically, this research will help researchers to understand PR more clearly and how it affects BI. It will also aid in making strategies that reduce the effect of a particular perceived risk factor found to influence BI negatively.

To address the research gap, this paper reviewed 44 articles on perceived risk and MPS or where MPS was considered a part and built an integrated model to explain the perceived risk factors related to MPS, thereby providing explanations of perceived risk to encourage adoption of MPS. The purpose of this research was to gain an overall understanding of

perceived risk and determine answers to the subsequent research questions (RQ's):

RQ1: Why and how perceived risk affects MPS and behavioural intention?

RQ2: Can we make a clear, consistent proposition using various theories about the relationship between perceived risk and behavioural intention?

RQ3: Why is it important to study from the point of view of perceived risk theory?

The article is structured as follows: A general idea of perceived risk theory and background of MPS are provided in Section 2. Section 3 talks about the method adopted for the literature review. Section 4 illustrates the descriptive findings. In Section 5, the thematic analysis results on the theories utilised and the outcome are examined. Future directions are discussed in Section 6. and lastly, in Section 7 conclusion is given.

Ⅱ. Theoretical Background of Perceived Risk

Perceived risk has been researched significantly from numerous perspectives and contexts. Hence various definitions and real-world applications can be found in the literature (Dahlberg et al., 2008, 2015). Perceived risk theory can be traced back to the start of 60's where Bauer said that "consumer actions result in consequences that cannot be anticipated with certainty and includes some unwanted consequences"(R. A. Bauer, 1960b). Since then, to conceptualise and describe perceived risk, quite a few dimensions have been examined, counting performance risk, financial risk, security risk, physio-

logical risk, time risk, privacy risk and social risk (Dahlberg et al., 2015; Khalilzadeh et al., 2017). The possibility that innovation will not be secure is a perceived risk (Liébana-Cabanillas et al., 2014b). Liébana-cabanillas et al. (2014) argued that perceived risk is consumer perception about adverse consequences and uncertainty about the transaction performed. The basic concept of perceived risk was introduced as a subjective construct by (Bauer, 1960). Cunningham (1967) said that perceived risk contains two dimensions of risk i.e., consequences and uncertainty. Consequences can include performance goals, psychological goals, or money time spent to accomplish these goals. Perceived risk is usually characterised and defined by technology acceptance. Researchers have agreed that "perceived risk can be explained in expressions of an action that might result in penalty that cannot be imagined with certainty, it might include some unwanted consequences" (Dahlberg et al., 2015). "Perceived risk is focused on degree of uncertainty regarding the consequences of new technology" (Phonthanukitithaworn et al., 2016a). However (Bauer, 1967; Gefen, 2003) termed it as "consequence of a decision reflecting the variation of its eventual result". (Dahlberg et al., 2008) referred it as "an expectation of loss and it will be higher when expectation of loss is higher, in a way he said that perceived risk is directly proportional to expectation of loss." Perceived risk theory focuses on the connection between uncertainty and consequences. The progression of this theory has led to numerous evaluations of the probability as well as the consequences of a negative outcome. It is a consumer behaviour theory which explains why consumer does not move from desired stage to actual stage (Dahlberg et al., 2015). Estimate of perceived risk cannot avoid elements of opinion whether that estimate is made by a researcher or a layman.

2.1. Theory of Risk

In 1960, Raymond Bauer pioneered the notion of perceived risk in consumer behaviour research. The concept is founded on the idea that all purchasing activity entails some level of risk. In this sense, every action taken by the buyer is likely to have effects that they cannot predict with any degree of certainty, and at least some of them are likely to be negative (Bauer, 1960a). The two fundamental aspects of risk are the uncertainty or probability of loss and the consequence or importance of the loss concept. Bauer further said that the buyer is obliged to cope with uncertainty and, as a result, chooses a strategy to limit perceived risk (Cunningham, 1967) observed that dimensions of perceived risk might involve a (known or unknown) probability. Cox (n.d.) broadened the perceived risk conceptualisation by considering every purchasing decision to be goal-oriented. Perceived risk has been researched significantly from numerous perspectives and contexts. Hence various definitions and real-world applications can be found in the literature (Dahlberg et al., 2008, 2015). Perceived risk theory can be traced back to the start of 60's where Bauer said that "consumer actions result in consequences that cannot be anticipated with certainty and includes some unwanted consequences" (Bauer, 1960b). The insecurity related to the exercise of innovation is considered as perceived risk (Liébana-Cabanillas et al., 2014b). Liébana-cabanillas et al. (2014) argued that perceived risk is consumer perception about adverse consequences and uncertainty about the transaction performed. Cunningham (1967) said that perceived risk contains two dimensions of risk i.e., consequences and uncertainty. Results can include performance goals, psychological goals, or money time spent to accomplish these goals.

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Although there is a long and varied research tradition on perceived risk, many authors have failed to recognise how pervasive the construct is in all stages of the purchasing process in their research (Mitchell, 1992). After demonstrating the numerous occasions when consumer risk perceptions directly impact consumer behaviour and purchasing patterns, the article will move on to a discussion of the Theory of Perceived Risk. The original model has been somewhat updated by (Peter and Ryan, 1976), and in its most basic form, can be represented as:

Risk = Probability of consequences occurring × Negative consequences of poor brand choice.

The idea of multiplying these two dimensions is

most likely derived from probability theory, in which utility is calculated by multiplying the probability by expected value.

(Cox, n.d.) divided the repercussions of a failed purchase into two categories: performance and psychosocial. Since then, to conceptualise and describe perceived risk, quite a few dimensions have been examined, counting performance risk, financial risk, security risk, psychological risk, time risk, privacy risk and social risk (Dahlberg et al., 2015; Khalilzadeh et al., 2017). The buyer/purchaser attempts to minimise the dissonance or losses associated with the purchase, whether in terms of time or, more commonly, psychological and social costs. These losses result from a mismatch between actual and predicted purchase performance, and they are essential to the Perceived Risk Theory (Mitchell, 1992).

According to existing literature, perceived risk is a multifaceted concept that includes social, time, financial, physical, performance, and psychological dangers. Privacy risk is recently added as the factor of perceived risk (Cheng and Huang, 2013; Featherman and Pavlou, 2003). Consumers avoid ambiguous purchasing situations due to behavioural deterrents. Because of the increased unpredictability in the digital environment, perceived risk has a significant impact (Chen and Chen, 2010; Farivar et al., 2017). With subtle alterations, contemporary researchers expand the perceived risk components studied by traditional researchers in online scenarios (Featherman and Pavlou, 2003). Many studies have investigated the perceived risks associated with mobile banking or e-commerce, but the research has been dispersed over the last decade. We could not find a comprehensive review of academic records to gain a thorough understanding of the issue. Prior systematic reviews were done to either better under-stand social commerce at a general level or to better understand social commerce at a more detailed level (Busalim and Hussin, 2016) or to look at the use of mobile payments in a specific industry or product class (Alalwan et al., 2017).

Perceived risk has been studied by various researchers covering various research fields. Yang et al. (2015) explored perceived risk and online payments. Chung and Holdsworth (2012) looked cultural and behavioural intent along with perceived risk. Williams (2018) researched social commerce and how perceived risk affects it. The systematic literature review offered in this paper focuses on reviewing MPS and perceived risk, which relates to the relationship between consumers and their perception of MPS. The primary definition for perceived risk w.r.t MPS found along this line are as follows:

"Perceived risk is a construct that reflects feelings of uncertainty among consumers regarding the possible negative consequences using new technology" (Phonthanukitithaworn et al., 2016b).

"Perceived risk is defined as the degree to which the consumer of mobile services, believes that he or she may be expected to certain types of financial, social, psychological, physical time risk" (Ozturk et al., 2017).

"Perceived risk is considered a multidimensional construct which is comprised of various factors and they all collectively explain the risk associated with the adoption of MPS" (Liébana-Cabanillas et al., 2015). (Gerpott and Kornmeier, 2009; Isaac et al., 2018) said the perceived risk is a vital factor when it comes to adopting mobile banking services.

Mobile payment is still a new service that hasn't caught on with many people in developing countries. As a result, academics have been interested in mobile payment user behaviour and have attempted to uncover the elements influencing user acceptance. The

majority of research focuses on initial adoption, and TAM is frequently utilised as a theoretical foundation. (Schierz et al., 2010b). Although previous research has looked into elements that negatively affect perceived risks in mobile banking and online shopping, little is known about customers' attitudes regarding these risks, variances across consumers, and the relationship between perceived risks and consumer types (small vendors and buyers). To overcome this lacuna in existing body of literature, an SLR on literature available from 2003 to 2020 is carried out and to map the most often used perceived risk factors - financial, privacy, performance, psychological, time, and security - with the kind of theories used in the innovation adoption. Perceived risk factors related to MPS are give in <Table 1>.

Important contributions to our current understanding of perceived risk have come from consumers' perception of e-commerce. Research further indicates that perceived risk affects behavioural intention, and there are strong views that seem resistant to change because they influence the way the subsequent information is understood. So it is essential to look at perceived risk with a different perspective; hence as suggested by the researchers that there is a need to study Merchant's perspective when it comes to perceived risk and MPS (Dahlberg et al., 2008; Dahlberg et al., 2008a; Dahlberg et al., 2008; Featherman and Pavlou, 2003).

Despite multiple published studies exploring various factors of PR there has been no systematic analysis of how theory is being employed (or not) in the field of MPS and perceived risk over the past decade. This study analyses the published research literature on MPS from 2003 to 2020 to determine which theoretical perspectives have been used to study perceived risk and discuss the questions and issues that arise from those theories and their applications. This article aims to look at theoretical views in the literature and contribute to a better understanding of the present state of research in the area and how it will develop in the future.

<Table 1> Perceived Risk Factors Related to MP

P.R. Factors	Definition	Reference
Performance Risk	There's a chance that a product will break down and fail to perform as expected.	(Featherman and Pavlou, 2003)
Financial Risk	The danger of future financial outlays associated to the initial purchase price as well as future maintenance costs	(Featherman and Pavlou, 2003)
Time Risk	Time risk can be defined as the risk of losing time while utilising MPS.	(Cocosila and Trabelsi, 2016; Featherman and Pavlou, 2003)
Privacy Risk	When a user takes up MPS, there is a risk that they will feel unsafe in their social context.	(Featherman and Pavlou, 2003)
Security Risk	Risk linked with the user's perception of reliance (in terms of security) on the mode of payment and associated arrangements for storing and transferring financial data	(Di Pietro et al., 2015; Vatanasombut et al., 2008)
Social Risk	The risk arises from the user's perceived pressure from the surrounding social environment to take up MPS.	(Cocosila and Trabelsi, 2016; Featherman and Pavlou, 2003)
Psychological Risk	User experience using mobile technology that is inconvenient, causing psychological aggravation or worry.	(Featherman and Pavlou, 2003)

The article is designed to help understand how theories are used in the Mobile payment research w.r.t perceived risk, how it relates to perceived risk, and how and when theory is used in research publications. Although both are important, it is neither a comprehensive treatment of theory development nor a discussion of the need to use a particular approach. This article aims to assist scholars in interpreting research findings and evaluating that evidence for validity so that they may utilise it in their studies. This review offers useful insights into the underpinning theories used in the fields of PR and MPS. The theory of reasoned action (TRA), the technology acceptance model (TAM), and the Unified Theory of Acceptance and Use of Technology (UTAUT) were all explored by a more significant number of scholars. These three theories/models are connected in some way. TRA (Fishbein and Ajzen, 1975) created the TAM (Davis, 1989). TAM has proven to be helpful in researching consumer behaviour related to technology adoption and MPS.

On the other hand, UTAUT (Venkatesh et al., 2003) combined eight technological acceptance models. It provides a more advanced and complete framework for studying consumer behaviour in technical and technology-enabled environments (Sykes et al., 2009; Venkatesh et al., 2003). This project's primary objective is to understand better and map the application of theories in literature so that potential research avenues may be suggested. The SLR methodology used in the paper is explained in the next section.
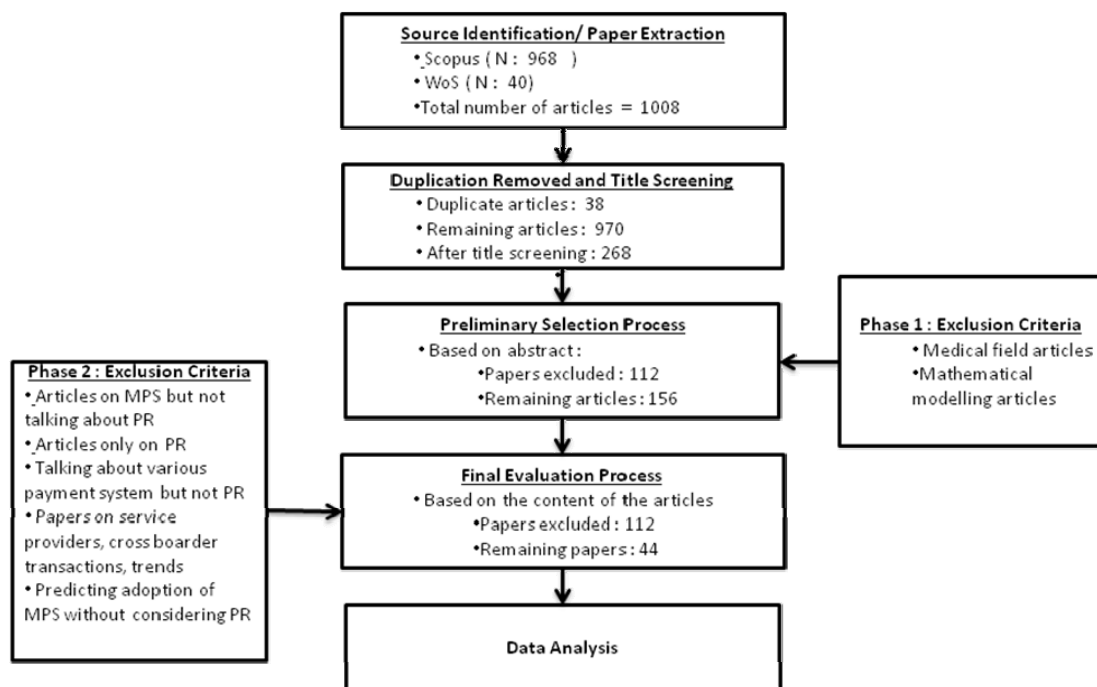
Ⅲ. Methodology

A systematic literature review (SLR) identifies, selects, and critically appraises material (Dewey and Drahota, 2016). Before the systematic review is done, the criteria should be explicitly established in a well-defined procedure or strategy (Dziopa and Ahern, 2011). A systematic literature review is a fundamental scientific activity that helps scientists to see the "big picture" in a given field. A systematic review analysis assesses and synthesises research findings to summarise current evidence that may be used to support evidence-based practise(Xiao and Watson, 2019).

A comprehensive evaluation of the literature in the MPS and perceived risk was conducted to focus on the research goals. According to (Denyer and Tranfield, 2009), "A systematic literature review is useful for locating, selecting, analysing, appraising and evaluating the literature that is relevant to a particular research question". Moher et al. (2009) said, "A systematic review has an objective, and explicit questions which need to be answered through systematic and transparent data collection and synthesis Preferred Reporting items for systematic reviews and meta-analysis (PRISMA)". It is a literature review, which is systematic and based on data extracted step by step. This provides a guide for reporting objectives in an objective, transparent and explicit way.

PRISMA protocol's first stage is the identification of records. The main problem in identification is what, how and where to find. For SLR, the identification of the research question plays a vital role. Considering the research questions, we made blocks of 9 keywords (<Table 1>). The search was conducted electronically in November- December 2019 using a database of SCOPUS and Web of Science. These two databases have been used at length in the existing literature. The major objective of utilising two repositories was to confirm uncompromising rigour in searching and selecting articles for future research.

Source Identification/ Paper Extraction
- Scopus (N : 968)
- WoS (N : 40)
- Total number of articles = 1008

Duplication Removed and Title Screening
- Duplicate articles : 38
- Remaining articles : 970
- After title screening : 268

Preliminary Selection Process
- Based on abstract :
  - Papers excluded : 112
  - Remaining articles : 156

Phase 1 : Exclusion Criteria
- Medical field articles
- Mathematical modelling articles

Phase 2 : Exclusion Criteria
- Articles on MPS but not talking about PR
- Articles only on PR
- Talking about various payment system but not PR
- Papers on service providers, cross boarder transactions, trends
- Predicting adoption of MPS without considering PR

Final Evaluation Process
- Based on the content of the articles
- Papers excluded : 112
- Remaining papers : 44

Data Analysis

<Figure 1> Article Search and Evaluation Process

Records acknowledged from these two sources were screened to eliminate duplicates or unrelated items. There are four main steps in this review; (i) identification of source (ii) selection of source, (iii) assessment of source, and (iv) analysis of data. <Figure 1> sketches the steps of the search method, and the following subsections explains the steps.

3.1. Identification of the Source

Using Scopus and Web of Science, the initial step was to perform a keyword search. The generic term "Risk" was used in conjunction with other keywords to extract the number of available resources.

The research was primarily aimed at reviewing the theories used to study perceived risk in MPSs. To start with building the corpus of articles, initially, 'perceived risk' or only 'risk' were used as the key-

words to be searched only in the abstracts of the papers. This search resulted to an enormous figure of around 3 million articles. To narrow down the research another layer of keywords was added. Since the term 'MPS' has been interchangeably used with terms like digital payment, e-payment, m-payment and mobile payment, these were also added to the list of keywords. This returned a total of 1008 articles. Finally, these two layers of keywords were finalised, giving an optimal size for building the corpus to carry out the SLR.

Amalgamation of these prevalent keywords helped to extract as many risks associated with studies as possible. Because of this, it was feasible to get around the restriction of having precise and firm keywords that may lead to the removal of considered risk-related information. In addition to "risk," a few additional possible keywords were utilised over several

<Table 2> Key Terms Used in the Search Strategy

Blocks	Keywords for search
Layer 1	"risk" OR "perceived risk"
AND	
Layer 2	"digital payment*" OR "e-payment*" OR "m-payment*" OR "mobile payment *"

<Table 3> Article Searching Protocol

Database	Field	Subject Area/ Research Domain	Doc. Types	Lang.	Total	Total Both	Duplicate	Remaining	After Title Screening
Scopus	Article title, Abstract, Keywords	Business, Management and Accounting, Social Sciences	Article; Review	English	968	1,008	38	970	268
Web of Science	Topic	Social Sciences	Article; Review	English	40				

rounds of data collection, as shown in <Table 2>. Unfortunately, most of the related papers appear to be primarily focused on multidisciplinary studies and payment systems. This would have impacted the article's emphasis, as the primary goal was defined as MPS, and therefore publications that were not relevant to MPS were deleted.

A total of 968 and 40 potential articles were extracted from Scopus and Web of Science, respectively. Papers found in WoS mainly were from the Medical field, hence removed, so we focused on 40 papers of our interest. <Table 3> exhibits the details of the search protocol.

3.2. Source Selection

"After pulling out significant articles from the database, the next elementary step was concerned with sketching boundaries of the analysis." (Maestrini et al., 2017). Articles discussing perceived risk in the context of payment systems were used in the subsequent analysis. Therefore, the titles of the 970 articles were screened and the articles unrelated to social science. There were talking about medical or mathematical modelling were removed. Post title screening 268 papers were recognised, and the abstract was read vigilantly and selected for the consequent analysis. In addition, all articles that have not mentioned anything about perceived risk and were irrelevant to the payment system were expelled. Total 156 articles were retracted after this process.

3.3. Evaluation of the source

The remaining 156 papers were scrutinised further using the inclusion and exclusion criteria mentioned in <Table 4>. The articles were chosen based on three key measures to ensure that all of the features studied by earlier academics were recorded and included. Studies that identified certain types and characteristics of perceived risk are included in the analysis. The perceived risk factors have been classified based on active and well-known theories and methods in the literature.

<Table 4> Criteria for Selecting Studies/Papers

No.	Criteria	Number of papers	Relevance
1	Studies defining PR and construct of PR	5	Inclusion
2	Studies defining PR w.r.t payment systems	39	Inclusion
3	Papers on service providers, cross border transactions , trends etc.	54	Exclusion
4	Talking about various payment system but not PR	38	Exclusion
5	Articles on MPS but not talking about PR	15	Exclusion
6	Articles only on PR	1	Exclusion
7	Predicting adoption of MPS without considering PR	4	Exclusion

- In the SLR, research that defined perceived risk were included. Articles in this category employ the broad concept of payment rather than mentioning or adopting a specific payment system concerning the perceived risk that has been defined or explored in the payment system literature. Additionally, articles in this category link perceived risk with existing theory (eg., TAM, UTAUT, IDT) (Koenig-Lewis et al., 2015; Shemi and Procter, 2018; Yang et al., 2012).

- Studies mentioning perceived risk without clear applications to payment system (54 papers) were disqualified for the analysis. (Apanasevic et al., 2016) the study was rejected because it contradicted the influence of payment systems on entrepreneurship. There is no discussion of the construct of perceived risk. Similarly, Shin (2009), in the introduction segment of their article, said that "perceived risk affects the intention." However, the analysis of perceived risk stops there without any additional description in the article.

3.4. Data analysis

Any systematic literature review must provide a conclusion.

The significant and definitive aim is to abridge the articles' conclusion and underline important messages that need further consideration from scholars. To recognise trends, themes and pertinent findings Microsoft Excel was used to do the data analysis. These consist of the string of publications in perceived risk, academic journals publishing perceived risk studies, countries where perceived risk studies are taking place, employed research methodologies, perceived risk orientations and relationships. Details of the revised documents are set out in <Appendix>.
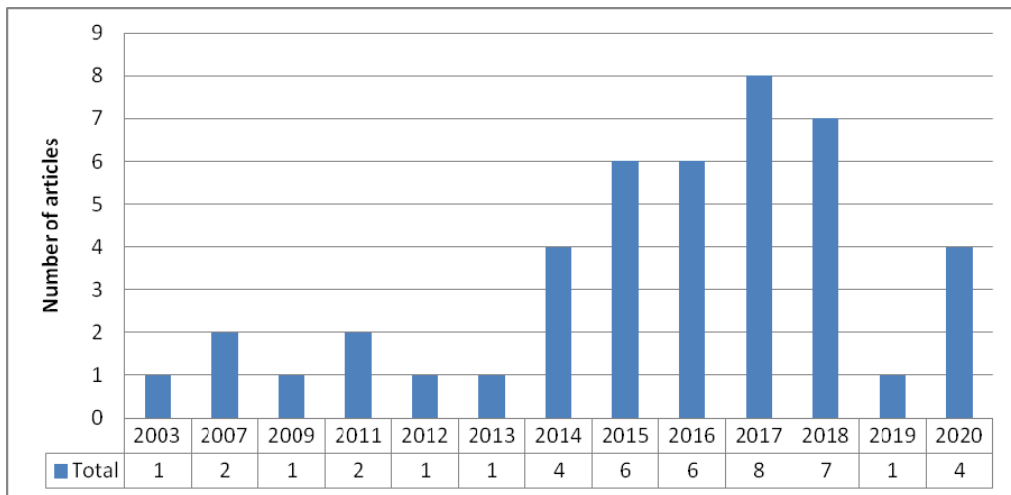
Ⅳ. Descriptive Findings
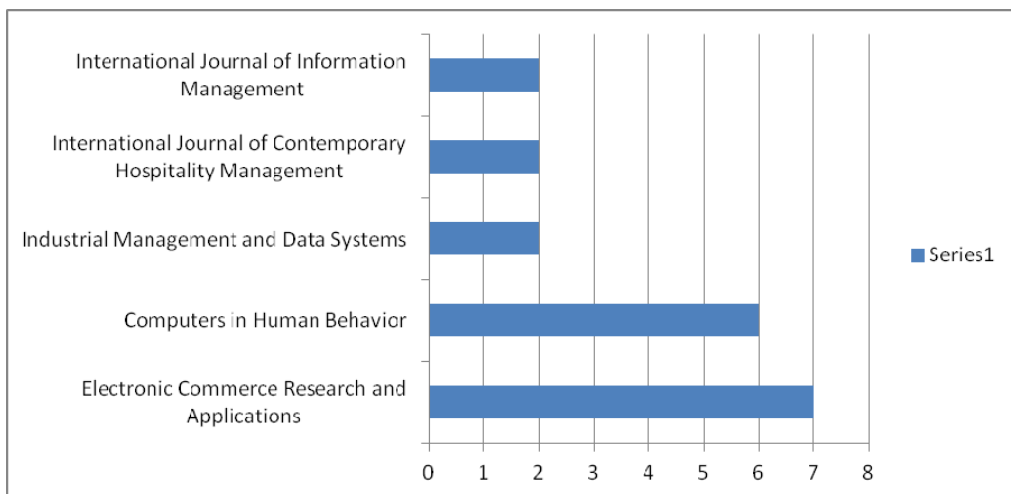
4.1. Historical Series

<Figure 2> exhibits year wise growth of literature. In the year (2013-2020) most of the articles among the 44 articles were published. (Lim, 2003) the study is one of the first papers on perceived risk and MPS. There has been a gradual rise in the number of researches on perceived risk and MPS.

4.2. Academic Journals

Journals that published articles related to perceived risk from 2003 to 2019 has been presented in <Figure

<Figure 2> Year-wise Growth of Literature
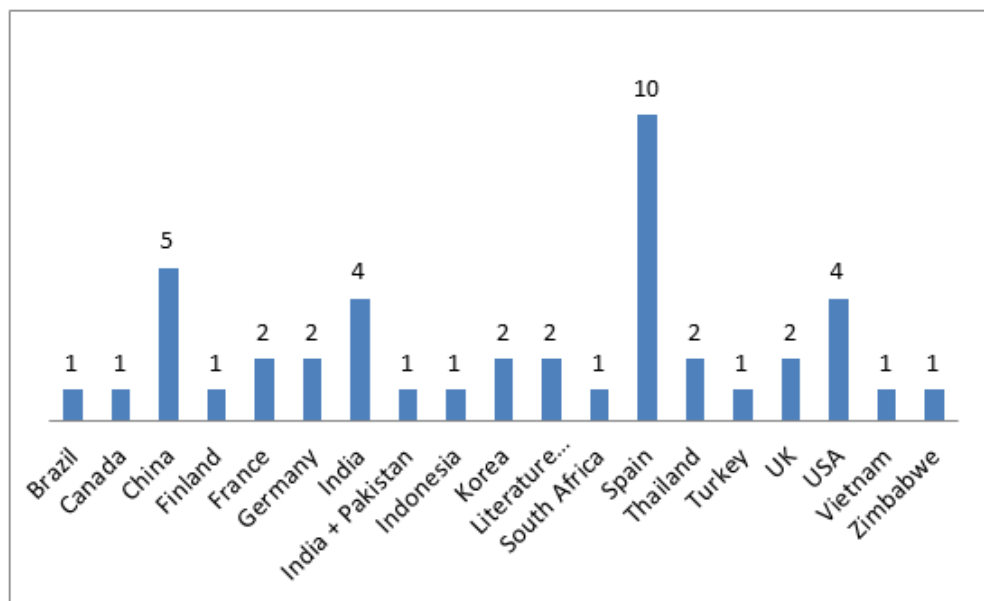

<Figure 3> Journal Publishing PR in MPS Articles

3>. The figure only displays the journals publishing with at least two articles published in the period mentioned above. The top journal is Electronic Commerce Research and Applications (7 papers), followed by Computers in Human Behaviour (6 papers). According to the rankings given by SCImago in line to evaluate the scientific influence of journals, the mentioned journals in <Figure 3> are in Quartile 1 (Q1).

4.3. Geographical Concentration

The countries where the data for the study was obtained are depicted in <Figure 4>. The top contributing countries are Spain (10 papers), followed by China (5 papers), the United States of America and India (4 papers). from the review, it can be concluded that the issue of perceived risk is extensively investigated in Western nations while

<Figure 4> Papers Classified by Country of Research

emerging nations like India and China are working on it.

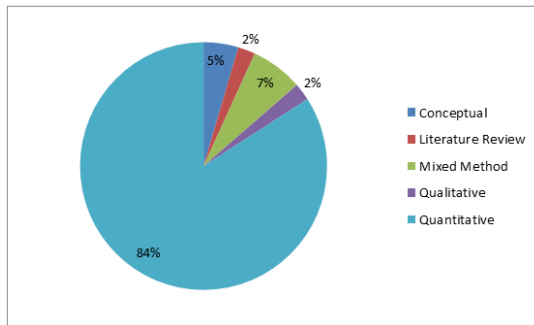## 4.4. Methodologies of Research

<Figure 5> depicts an overview of the research techniques used in the publications. For a thorough categorisation of each work, see <Appendix>. The research methodology adopted in the paper has been classified into four classes: Quantitative, Qualitative, mixed-method and conceptual research.

Quantitative research (84%) – This group characteristic of studies that employ quantitative research and analytic methodologies. In all of the publications, survey research was employed. SEM, PLS-SEM (partially least square structural equation modelling), multiple regression, and correlation analysis are some of the approaches used. For example, Makki et al. (2016) deployed a survey method and common factor analysis with SEM to examine how risk perception

affects behaviour. Abrahão et al. (2016a) used a survey method and UTAUT to determine the factors affecting the intention to adopt MPS. Lu et al. (2011b) used factor analysis to observe the role of trust and perceived risk in adopting MPS. They argued that trust reduces perceived risk.

Qualitative research (2%) – Qualitative research methods and data analysis characterise this group. They were mainly using a case study based empirical methodology. Papers in this study used focus group interviews for data collection. (Mallat, 2007) interviewed six different consumer stages in mobile payments adoption and identified perceived risk as a barrier in adoption.

Mixed method research (7%) – This type of research is distinguished by investigations that combine qualitative and quantitative methodologies in a single study. For example, (Liébana-Cabanillas et al., 2014b) used semi-structured interviews and survey research (questionnaires) in his research. A qualitative person-

<Figure 5> Employed Research Methodologies

al interview and the quantitative test were carried out to validate their instrument, and then a pilot test was conducted among students through a web survey.

Conceptual research (5%) – Conceptual papers are the distinguishing feature of this category. This group includes papers that do not provide or use empirical data. Instead, describe potential study subjects, provide fresh ideas on perceived risk or MPS (Dahlberg et al., 2008; Dahlberg et al., 2015), or offer an overview of the literature on MPS. For MPS (Featherman and Pavlou, 2003) was also considered.

Employed research methodologies used in the literature are given in <Figure 5>.

Ⅴ. Thematic Analysis and Major Findings

5.1. Theories Used to Study Perceived Risk in MPS

<Table 5> depicts the theories used to explain the perceived risk in MPS that are seen in the reviewed articles. Three major theories have been used frequently, namely (i) Technology acceptance model (TAM), (ii) Theory of reasoned action (TRA) (iii)

<Table 5> Theories Used to Explain the Perceived Risk in MPS

Theory(s)	Total
Consumer Response system model and the Affect heuristic	1
Contingency Theory	1
DOI	1
DOI + economic theory of utility	1
Innovation Diffusion Theory	1
Perceived Risk	3
Resistance Theory	1
TAM	7
TAM + Innovation Diffusion Theory	1
TAM + Innovation Resistance Theory	1
TAM + MOPTAM+ UTAUT	2
TAM + TPB + IDT + MPSTAM	1
TAM + TPB + UTAUT + IDT	1
TAM + TRA + UTAUT	2
TAM + UTAUT	1
TAM + UTAUT + Perceived Risk	1
TAM + UTAUT2	1
TRA	1
TRA + TAM	2
TRA + TPB + TAM	1
TRA + TPB + TAM + DOI	1
TRA +TPB + TAM + Innovation Diffusion Theory	1
TRI	1
Trust Transfer Theory + IDT	1
UTAUT	1
UTAUT + Perceived Risk	1
UTAUT2	1
Valence Theory	1
Grand Total	**42**

Unified theory of acceptance and use of technology (UTAUT). These three theories are either studied alone or are used to study perceived risk along with other theories.

It was observed that papers tend to discuss perceived risk as a barrier to adopt technology. In doing

<Table 6> Frequently used theories

Theory(s)	Sum of Count	Sum of Total
IDT	1	5
IDT + Theory	4	
TAM	7	23
TAM + Theory	16	
TRA	1	8
TRA + Theory	7	
UTAUT	2	11
UTAUT + Theory	9	
Grand Total	**47**	**47**

so most frequently, the used theory was TAM , which alone topped the list of most commonly used theory (in <Table 6>) in studying perceived risk w.r.t MPS and TRA, which is the third most used theory (only been used once by Phong et al. (2018)). It has been used along with other theories in eight articles, from which three were with TAM (Liébana-Cabanillas et al., 2014a; Yang et al., 2012). On the other side, UTAUT is the second most used theory in this area, has two papers alone (Abrahão et al., 2016; Mallat, 2007), where (Mallat, 2007) used UTAUT 2. Most surprisingly, there were only three papers found using perceived risk theory w.r.t MPS (Hong and Cha, 2013; Karoubi et al., 2016; Makki et al., 2016). Where Makki et al. (2016) studied perceived risk with UTAUT.

5.1.1. Technology Acceptance Model: TAM

Technology Acceptance Model (TAM) is a theory which talks about how consumers come to accept and utilise technology. "The degree to which a person believes that using a particular system would be free from effort" (Herrera et al., 2016). According to Ozturk and Williams (2018), "The most dominant theory used in MPS and perceived risk literature is the one based on the mediating role of perceived

usefulness (PU) and perceived ease of use (PEOU) and the relationships between external variables and the probability of technology acceptance". Considering other theories used in MPS literature, TAM appears to have an advantage because it is simpler to apply and efficient to predict and explain individuals' adoption intentions (Phonthanukitithaworn et al., 2016a). Ozturk et al. (2017b) studied the relationship between two exogenous variables (self-efficacy and perceived risk) and three endogenous variables (PU, PEOU and BI) using the extended version of TAM. They came to the conclusion that perceived risks don't affect intent to use. Whereas (Hong and Cha, 2013) in his study found that the dimensions of perceived risk play a major role in the impact of perceived risk and its consequences. In his study using a mediated model, he confirmed that psychological and performance dimensions of perceived risk and trust are deeply connected, and his findings were also in line with other studies (Johnson-George and Swap, 1982; Olivero and Lunt, 2004). He also found that in the unmediated model intention is negatively affected by consumer's perceived risk (i.e., performance risk and financial risk) whereas social risk turns out not to influence intention.

The finding contrary to the original TAM was seen in the study of (Sinna Lebbe et al., 2019) where the direct effect of PEOU on BI is negative. To investigate whether PU plays a role in between PEOU and BI, an indirect effect was investigated, and was found that PU plays a role in between PEOU and BI. (Huang et al., 2011) had also made the same observation in his study.

Perceived risk has been often considered a uni-dimensional construct and largely focuses on exhibiting that it inhibits intentions (Hong and Cha, 2013). The "core TAM" has been studied with additional constructs such as trust, attitude, innovativeness etc.

<Table 7> TAM and Associated Variables

Paper Code	PU	PEOU	PR	Perceived Risk Dimensions				
				Perceived Security	Performance	Psychological	Social	Financial Risk
1	PU → (+)BI	PEOU → (+)Att,PEOU → (+)PU, PEOU → (+)BI	*	P.S→(+)Att	*	*	*	*
3	PU → (+)BI	PEOU → (+)BI & PEOU (+)PU	PR → (-)BI	*	*	*	*	*
	Innovativeness & Convenience (Moderator)	Innovativeness & Convenience (Moderator)	Innovativeness & Convenience (Moderator)	-	*	*	*	*
10	PU → (+)BI	PEOU → (-)BI	PR → (-)BI	*	*	*	*	*
18	PU → (+)BI	PEOU → (+)BI, PEOU → (+)PU	DO not affect BI	*	*	*	*	*
25	UnMediated Model	PEOU → (+)BI	*	*	PeR → (-)BI	Psych → (-)BI	No Influence on BI	FinR→(-)BI
25	Mediated Model	PEOU → (+)BI	*	*	Trust is a mediator	Trust is a mediator	-	-
26	PU → (+)BI	PEOU → (+)BI, PEOU → (+)PU	PR→(-)BI	*	*	*	*	*

Our study focuses on perceived risk and intention; hence, <Table 7> demonstrates TAM and variables studied with it. Most studies using TAM confirmed negative relation between perceived risk and BI. Gerhardt et al. (2010) and Williams (2018) Studied mobile credit card payment systems. They demonstrated a negative relation between PR and BI whereas (Hong and Cha, 2013) studied e-commerce. And has given the mixture of the mediated and unmediated effect of perceived risk on intention and confirmed that trust plays a mediated role between these two and performance risk, psychological risk and financial risk has negative relation with intention. Still, social risk, on the other hand, has no connection.

5.1.2. Technology Acceptance Model in Conjunction with Other Theories

In several research attempts, TAM exhibits a par-simony scale because it is limited to only two individual beliefs. Hence, researchers adapted TAM for studying it in combination with other theories (Khalilzadeh et al., 2020; Koenig-Lewis et al., 2015; Phonthanukitithaworn et al., 2016a). Within this academic domain it has to be marked that 19 papers were inclined towards the factors determining acceptance, with only 2 studying at the same time with a concurrent application of adopters / non-adopters and relation between adoption readiness, perceived risk and intention (Phonthanukitithaworn et al., 2016a; Thakur and Srivastava, 2014). <Table 8> indicates the studies that used TAM in conjunction with other theories.

According to TAM, the focal antecedent and central mediator impacts the variables indicating an intention to use, which is based on an individual's desire to utilise technology (Schierz et al., 2010a). Tan et al. (2014) quoted that "perceived risk is the

<Table 8> Technology Acceptance Model in Conjunction with Other Theories

Theory(s)	Total
TAM	7
TAM + Innovation Diffusion Theory	1
TAM + Innovation Resistance Theory	1
TAM + MOPTAM+ UTAUT	2
TAM + TPB + IDT + MPSTAM	1
TAM + TPB + UTAUT + IDT	1
TAM + TRA + UTAUT	2
TAM + UTAUT	1
TAM + UTAUT + Perceived Risk	1
TAM + UTAUT2	1
TRA + TAM	2
TRA + TPB + TAM	1
TRA + TPB + TAM + DOI	1
TRA +TPB + TAM + Innovation Diffusion Theory	1
Grand Total	**23**

most important factor in evaluating whether to adopt mobile phones for commercial use as technology failure could lead to financial or psychological loss". Phonthanukitithaworn et al. (2016b) said that "perceived risk can reduce the intention to adopt MPS whereas it is also proven that perceived risk and intention to adopt e-payment is not related at all" (Özkan et al., 2010). However, they also clarified that perceived risk might not directly affect behavioural intention but has an indirect effect.

When talking about general mobile users, Koenig-Lewis et al. (2015) confirmed that Social influence reduces perceived risk, whereas (Yang et al., 2012) in his study about adopters and non-adopters demonstrated that social impact is not significant for current users of MPS. Yang et al. (2012c) said that the "indirect effect of social influence on mobile commerce is not validated, but as per their finding, influences from colleagues, important social circles and friends are major determinants for potential users of MPS."

5.2. UTAUT: Unified Theory of Acceptance and Use of Technology

The UTAUT model was created to forecast the adoption and usage of technology in an organisational environment (Viswanath Venkatesh et al., 2003). To build up this model, some fundamentals of behavioural intention models previously used in technology acceptance contexts such as TRA, IDT, TRA, TAM, the model of computer program (PC) utilisation, TAM in conjunction with TPB model and models reflecting social cognition theory were synthesised (Khalilzadeh et al., 2017). Hence it consists of six min constructs: performance expectancy, facilitating conditions, social influence, effort expectancy, behavioural intention and behavioural usage. Koenig-Lewis et al. (2015) and Shin (2009) stated that UTAUT delivers a strong foundation for theory for apprehending adoption of MPS because this theory, including TAM surpasses the technological aspects and

<Table 9> TAM in Conjunction with other Theories and Associated Variables

Paper Code	PU	PEOU	Perceived enjoyment	Social Influence	Compatibility	Perceived Risk	Factors of perceived risk			Trust	Social Influence
							Security Risk	Privacy Risk	Monetary Risk		
7	PU → (+)BI	PEOU → (n.s.)PU & PEOU → (n.s)BI	PE → (-)PR	SI → (-)BI	*	PR → (-)BI	*	*	*	*	*
9	PU → (n.s)BI	PEOU → (n.s.)PU	*	*	*	PR → (n.s.)BI	*	*	*	*	*
9a	PU → (n.s)BI	PEOU → (BI)	*	*	*	PR → (-)BI	*	*	*	*	*
14	PU → (+)BI	PEOU → (n.s.)BI	*	*	*	PR → (-)BI	*	*	*	*	*
15	*	*	*	*	*	PR → (-)BI	*	*	*	*	*
16	*	*	*	*	*	PR → (n.r.)BI	*	*	*	*	*
19	*	*	*	*	*	PR → (n.r.)BI	*	*	*	*	*
23	*	*	*	*	Compati → (-)PR	PR → (n.s.)BI	*	*	*	*	*
24	*	*	*	*	*	Risk → (n.s.)BI	*	*	*	*	*
33	*	*	*	*	*	PR → (-)BI	SecR → (+)PR	PriR → (+)PR	MR → (n.s.)PR	*	*
34	*	*	*	*	*	PR → (-)BI	*	*	*	Risk → (-) Trust	
36	*	*	*	*	*	PR → (-)BI	*	*	*	*	PR → (n.s.)SN
36a	*	*	*	*	*	PR → (-)BI	*	*	*	*	PR → (-)SN
37	*	*	*	*	*	PR → (-)BI	*	*	*	*	*
38	*	*	*	*	*	PR → (-)BI	*	*	*	*	*
39	PU → (+)BI	PEOU → (+)PU & PEOU → (+)BI				PR → (-)BI	*	*	*	*	*
42	*	*	*	*	*	PR → (-)BI	*	*	*	*	*

is instead devoted to individual's factors and effect of social influence, which eventually governs decision of a consumer. UTAUT 2 also claims to have superior predictive ability compared to TAM (Venkatesh et al., 2012). Makki et al. (2016) also found that "risk partially and negatively mediates the relationship between consumer's innovativeness and intention to use near field communication (NFC) based mobile payment."

<Table 10> Theories Used Along with UTAUT

Theory(s)	Total
TAM + MOPTAM+ UTAUT	2
TAM + TPB + UTAUT + IDT	1
TAM + TRA + UTAUT	2
TAM + UTAUT	1
TAM + UTAUT + Perceived Risk	1
TAM + UTAUT2	1
UTAUT	1
UTAUT + Perceived Risk	1
UTAUT2	1
Grand Total	**11**

<Table 11> UTAUT and Associated Variable

Paper Code	PR	Factors of Perceived Risk						Perceived Enjoyment	Social Influence	Innovativeness	Security	Utilitarian Performance Expectancy	Trust
		Time R	SecR	PriR	PerR	PU	Monetary R						
2	PR → (n.s)BI	TR → (+)PR	*	PriR → (+)PR	PeR → (+)PR	*	*	*	*	PR → (*)Inn	*	*	*
7	PR → (*)BI	*	*	*	*	PU → (+)BI	*	PE → (*)PR	SI → (*)BI	*	*	*	*
8	PR → (*)BI	*	*	*	*	*	*	*	*	*	*	*	*
15	PR → (*)BI	*	*	*	*	*	*	*	*	*	*	*	*
20	*	*	*	*	*	*	*	*	*	*	Risk → (*)Security	Risk → (n.s)UtlPer Exp	Risk → (*) Trust
21	PR → (*)BI	*	*	*	*	*	*	*	*	*	*	*	*
24	PR → (n.s.) BI	*	*	*	*	*	*	*	*	*	*	*	Risk → (*) Trust
33	PR → (*)BI	*	SecR → (+)PR	PriR → (+)PR	*	*	MR → (n.s.)PR	*	*	*	*	*	*
34	PR → (*)BI	*	*	*	*	*	*	*	*	*	*	*	*
38	PR → (*)BI	*	*	*	*	*	*	*	*	*	*	*	*

5.3. TRA: Theory of Reasoned Action

Fishbein and Ajzen (1975) created the idea, and according to this hypothesis, "person's attitude and subjective norms influence the behaviour of accepting or rejecting something." This model also suggests

that willingness to do a particular activity determines a consumer's actual behaviour, while individual behaviour and subjective norms influence behavioural intention. At the same time, the association between motivation and how beliefs are evaluated governs an individual's behaviour and subjective criteria (Phonthanukitithaworn et al., 2016a).

5.4. Relation between Perceived Risk and Behavioural Intention w.r.t MPS

This study analysed the theories on the perceived risk in the reviewed articles. As MPS contributes to the ease of transaction, the categorisation of each retrieved paper is also based on the risk involved, and behavioural intention studied, as shown in

<Appendix>.

The contribution of various theories is prominent in improving the understanding of perceived risk. Studying and understanding theories help to understand the need and requirements of consumers properly.

Perceived risk can influence the intention to adopt technology either negatively or slightly significantly to the consumer. Most of the reviewed articles claimed negative relation with perceived risk (Thakur and Srivastava, 2014; Yang et al., 2012), whereas few articles said that "there is no significant relationship between perceived risk and behavioural intention" (Liébana-Cabanillas et al., 2014b). According to Phonthanukitithaworn et al. (2016b), perceived risk is not significant in the case of adopters, whereas
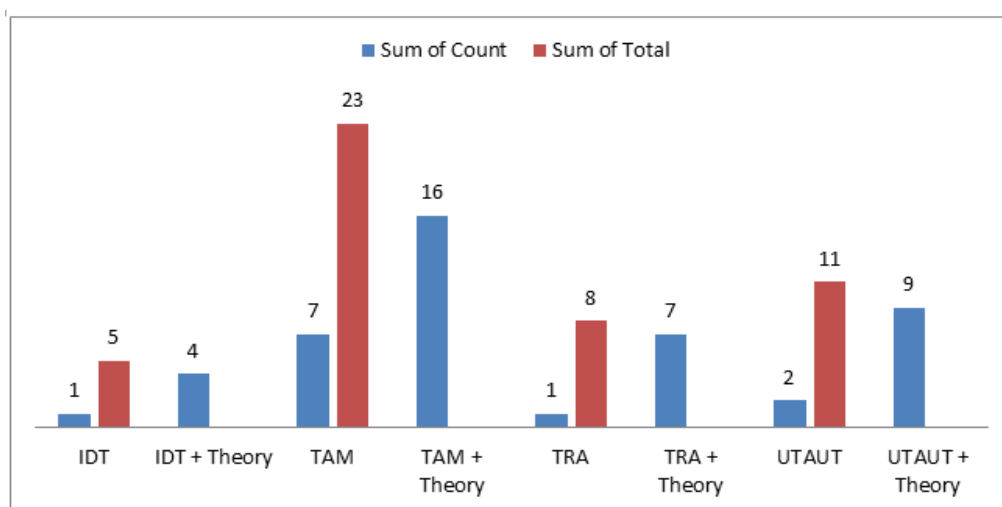
<Table 12> Theories Used Along with TRA

Combination of theories	Count of Theory Used
TAM + TRA + UTAUT	2
TRA	1
TRA + TAM	2
TRA + TPB + TAM	1
TRA + TPB + TAM + DOI	1
TRA +TPB + TAM + Innovation Diffusion Theory	1
Grand Total	**8**

<Table 13> TRA and Associated Variable

Paper Code	PR	PU	PEOU	Subjective norm	PIIT
9	PR → (n.s.)BI	PU → (n.s)BI	PEOU → (n.s.)PU	*	*
	PR → (*)BI	PU → (n.s)BI	PEOU → (BI)	*	*
14	PR → (*)BI	PU → (+)BI	PEOU → (n.s.)BI	*	*
16	PR → (n.r.)BI	*	*	*	*
24	PR → (n.s.)BI	*	*	*	*
35	PR → (*)BI	*	*	*	*
36	PR → (*)BI	*	*	PR → (n.s.)SN	PR → (n.s.)PIIT
42	PR → (*)BI	*	*	*	*

<Table 14> Difference in Relation Found between PR and BI

BI and PR Relation	Paper Code
PR → (-)BI	3, 7, 8, 9, 10, 14, 15, 21, 24, 26, 33, 34, 35, 36, 37, 38, 39, 42
PR → (n.s.)BI	2, 9, 23, 24
PR → (n.r.)BI	16, 19
Does not affect BI	18
Articles not studied relation	1, 25

<Figure 6> Number of Papers Based on Theory Used

non- adopters or potential users are affected by it. This observation is also in line with the findings of Yang et al. (2012b). <Table 14> points the difference in relation found between PR and BI. Using the most used theories wherein one article (Tan et al., 2014) said the PR is non‑significant in the case of mobile credit cards, and the reason given was young users as they are more willing to try the technology. Francisco said that "there is no relation between perceived risk and behavioural intention regarding MPS in Virtual Social Network and e-payment services." contrary to many studies. Using UTAUT (Makki et al., 2016), it was discovered that while perceived risk as a whole is not substantial,

time risk, performance risk, and privacy risk all have a positive impact on intention. Still, innovativeness has a negative effect on perceived risk. On the other hand, using TAM (Williams, 2018), innovativeness plays a part of moderator in potential user in social commerce and mobile platforms.

<Figure 6> represents a number of papers based on theory used where it has been found that the role of TAM is prevalent in the MPS literature. TAM is used to adopt MPS and to understand non‑adopters perspectives (Hong and Cha, 2013). Using UTAUT (Makki et al., 2016).

Ⅵ. Discussion

Even though most of the literature in MPS advocates that perceived risk leads to a negative approach to behavioural intention, such as decreasing mobile payment usage. At present, the magnitude of perceived risk is not adequately studied and researched. Essentially, the authors presented only perceived risk as a whole, without considering any dimensions that are very prone to get affected differently from the existing and changing environment. This phenomenon aligns with suggestions given in several seminal works (Dahlberg et al., 2008, 2015; Featherman and Pavlou, 2003). For instance, Dahlberg et al. (2008a) quoted that changes in cultural, commercial, technological, and legal factors in conjunction with the market's other competitive forces drive the development. In addition, Featherman and Pavlou (2003) decomposed the perceived risk variable into its theorised facets and found privacy, time, performance, and financial risk to be the most salient concerns. Hence, drawing upon these insights from literature, a process of combining the dimensions of perceived risk and environmental factors should be done to add the knowledge in literature of MPS and perceived risk. The influence of perceived risk on MPS as a whole may be understood by looking at these two together.

Most MPS studies that used TAM and UTAUT did not examine perceived risk as a predictor of acceptance intention. At the same time, studies have shown that security is a major concern in adopting MPS among consumers (Chen, 2008; Lu et al., 2011; Yang et al., 2012). For example, the MPS literature is very concerned about perceived ease of use (Karsen et al., 2019), factors influencing technology acceptance and usage (Zhang et al., 2018). Findings from the literature also point that users are sensitive to social influence. According to Koenig-Lewis et al.

(2015), perceived ease of use and perceived risk are highly affected by social influence.

The significance of perceived risk is even more pronounced in case there is a context of adoption of MPS by consumers who have lesser exposure to the innovation in payment systems (Phonthanukitithaworn et al., 2016a). Perceived risk also partially mediates the relationship between social influence and behavioural intention in the potential adopters (Yang et al., 2012). Thus, to observe and explain the relationship of perceived risk between different concepts, we reviewed various theories. This in turn, allows us to explain and figure out how the community, who is still trying to get familiar with this technology, gets affected. Hence our study contributes by examining the theories, and our results verify that perceived risk has a significant negative influence on behavioural intention. In contrast, in some cases, it is not substantial.

6.1. Implications

To increase consumer adoption, concerns such as privacy and security needs should be taking care of the social environment, which plays a vital role in this process. Hence, word of mouth from opinion leaders is essential for faster diffusion of this technology among non‐users. This research presents a theoretical explanation of perceived risk and its impact on MPS adoption. For a developing economy like India, MPS has significantly changed the payment system; hence, adopting this technology by merchants, specifically small vendors, is significant. This study can be a base to study consumers' perspectives so that researchers can deeply understand and process the thought process of merchants.

The findings of this research provide several suggestions for research and practice. Based on this study,

scholars can decide which theories should be chosen to analyse consumer intentions and behaviour towards mobile payment methods in e-commerce. In addition, the study provided the main limitations of existing research and identified the direction for further studies.

This study's findings may help scholars understand the perceived risk behaviour of users and potential users. In addition, the results of this study can be used to propose appropriate strategies to help improve the adoption of the MPS. This article discusses what we have learned from the literature and provides a starting point for anyone who considers the perceived risk and MPS to be a subject of study. It helps to identify possible purposes and methods that are most appropriate for the study.

Ⅶ. Conclusion

This research is aimed to make available a structured literature review of theories used to study perceived risk in MPS, to achieve these 44 articles which focus on MPS and perceived risk were collected and analysed. The database used for collection articles were SCOPUS and WoS. Based on the results, following several conclusions were drawn. Most of the studies focused on factors affecting the intention to adopt MPS by using TAM as the theoretical foundation. It was found that out of 44 articles, 23 articles talked about factors determining acceptance. The particulars of the search protocol are given in <Table 1>. Based on the inclusion and exclusion criteria, the 44 papers were examined. Our final approach was to critically analyse the articles, sum up the articles' findings, and underline the important message regarding perceived risk.

The present literature was synthesised for the oc-

currence of perceived risk and its dimensions, constructs, and definitions to offer a complete evaluation of the perceived risk concept. This article reviews the literature in MPS domain and analyses the role of perceived risk towards the potential performance of MPS users. In addition, the study of the perceived risk concept is currently focused on adoption. However, there are a few studies that show an increasing interest in studying the perceived risk concept of non-adopters.

The main conclusion of this study is the recognition of dominant theories and styles used to elucidate the perceived risk notion and its impact on mobile payment practices. In summary, the finding reveals that TAM theory has overcome the current literature notion of perceived risk.

Overall, this article has three contributions:

- First, it connects broader arguments about knowledge formation to the subject of MPS and perceived risk, thus enriching the debate over its academic legitimacy.

- Second, it conducts a state-of-the-art review to assess theoretical views in the field of MPS and PR. None of the previous studies have taken stock of theories in MPS and PR.

Thus, this paper exhibits novelty in this aspect. Finally, it proposes an overarching map of prevalent theories in MPS that summarises the current level of knowledge.

There are a variety of ways in which this study contributes to theory and practice. First and foremost, this study adds to the current knowledge and builds on the previous review (Dahlberg et al., 2015). Following that, this article lists four perceived risk research areas that deserve more investigation and

inquiry, based on current gaps in the literature: (i) Less number of studies and explanation of perceived risk in potential user (ii) the absence of vendor's issue and guidance (iii) the lack of theoretical explanation and (iv) the role of perceived risk towards vendor's performance. The research plan lays the groundwork for future research to fill up knowledge gaps. It will aid potential researchers in avoiding congested and stagnant areas of MPS research and risk perception. In addition, this study provides a brief summary of the existing knowledge and comprehension of the conceptual meaning of perceived risk. Since this research focuses mainly on academics, it would be helpful to consider the perceived risk definition explored by scholars. In addition, the perceived risk structures can be used and repeated by policymakers when assessing and reconfiguring their strategies. For instance, lessons well-read from this study, such as the social risk impacting behavioural intention, should be addressed when designing a plan for implementing the MPS. The article has a few

flaws, even though it focuses on some intriguing literary discoveries. First, while the article retrieval approach provides the first complete systematic review in this subject, it risks omitting or overlooking significant studies.

Our study mainly focuses on the theory used in MPS; future studies can look at the influence of other factors (trust and attitude) on perceived risk. Secondly, since India is a developing country and MPS has changed the ecosystem significantly. Adoption of this technology by small vendors can be significant for small businesses to grow. There can be a "chicken and egg" kind of evolution where small vendors do not invest in MPS and wait for the clear affirmation from clients, while clients may dilly-dally using these provisions and wait till they are sure that small vendors will accept such payment. Scholars have focused solely on the consumer's perspective of adoption, employing a variety of theories; nevertheless, the merchant's perspective can also be investigated in light of perceived risk.

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