

**THE REPUBLIC OF TURKEY
BAHCESEHIR UNIVERSITY**

**INTEGRATING TECHNOLOGY ACCEPTANCE MODEL
WITH INNOVATIVENESS AND PERCEIVED RISK:
A STUDY OF TRENDYOL**

Master Thesis

BURCU TEKCAN

ISTANBUL, 2021

**THE REPUBLIC OF TURKEY
BAHCESEHIR UNIVERSITY**

**GRADUATE SCHOOL
MASTER OF BUSINESS ADMINISTRATION PROGRAM**

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Thesis Advisor: ASSOC. PROF. DR. OYLUM KORKUT ALTUNA

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ABSTRACT

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Technological advancements in cellular technologies and the increasing number of people who use smart mobile devices contribute to exponential growth of e-commerce. Mobile commerce is a new form of e-commerce activity that takes place on mobile devices leveraging cellular telephone networks and wi-fi technologies. Because of the unique features and limitations of mobile devices and the wireless network, mobile commerce works in a different way than traditional ecommerce. With regard to mobile commerce's characteristics such as personalization, flexibility, and distribution, it offers much more appealing retail possibilities than conventional e-commerce.

This study was based on the claim that mobile commerce applications' acceptance is an important marketing reality for the retail market since it has serious effects on consumers' attitude towards mobile commerce and their intention to use mobile commerce applications. This study gives insight into the acceptance of mobile commerce technology by Turkish consumers. Trendyol was chosen for a more in-depth analysis because it is one of the most popular mobile commerce applications in Turkey and also the most used mobile commerce application by the participants of this study. To explore the effects of perceived ease of use, perceived usefulness, consumer innovativeness and perceived risk on consumers' attitudes towards mobile commerce and their intentions to use mobile commerce, an online survey is conducted by 250 participants. The results were analyzed by sampling profile, mobile commerce usage habits of participants, reliability analysis of scales, descriptive statistics for research variables, exploratory factor analysis, and multiple regression analysis. As a result, it is concluded that perceived usefulness and innovativeness have significant effects on consumers' attitude towards mobile commerce and their intention to use mobile commerce.

Keywords: Mobile Commerce, Technology Acceptance Model, Perceived Risk, Innovativeness

ÖZET

YENİLİKÇİLİK VE ALGILANAN RİSKİN TEKNOLOJİ KABUL MODELİ İLE ENTEGRASYONU: TRENDYOL ÇALIŞMASI

Burcu Tekcan

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Hücreli teknoloji gelişmeleri ve akıllı mobil cihazları kullanan insan sayısının artması, e-ticaretin katlanarak büyümesine katkı sağlıyor. Mobil ticaret, hücreli telefon ağlarını ve wi-fi teknolojilerini kullanan mobil cihazlarda gerçekleşen yeni bir e-ticaret etkinliği biçimi olarak tanımlanabilir. Mobil cihazların ve kablosuz ağların benzersiz özellikleri ve sınırlamaları nedeniyle, mobil ticaret geleneksel e-ticaretten farklı bir şekilde çalışır. Mobil ticaretin kişiselleştirme, esneklik ve dağıtım gibi özellikleriyle ilgili olarak, geleneksel e-ticaretten çok daha çekici perakende olanakları sunar.

Bu çalışma, tüketicilerin mobil ticarete yönelik tutumları ve mobil ticaret uygulamalarını kullanma niyetleri üzerinde ciddi etkileri olduğu için mobil ticaret uygulamalarının kabulünün perakende pazarı için önemli bir pazarlama gerçekliği olduğu iddiasına dayanmaktadır. Bu çalışma, mobil ticaret teknolojisinin Türk tüketiciler tarafından kabul edildiğine dair fikirler vermektedir. Trendyol'un Türkiye'nin en popüler mobil ticaret uygulamalarından biri olması ve aynı zamanda bu çalışmanın katılımcıları tarafından en çok kullanılan mobil ticaret uygulaması olması nedeniyle daha derinlemesine bir analiz yapmak için seçilmiştir. Algılanan kullanım kolaylığı, algılanan yararlılık, tüketici yenilikçiliği ve algılanan riskin tüketicilerin mobil ticarete yönelik tutumları ve mobil ticareti kullanma niyetleri üzerindeki etkilerini keşfetmek için 250 katılımcı tarafından çevrimiçi bir anket yürütülmüştür. Sonuçlar, örnekleme profili, katılımcıların mobil ticaret kullanım alışkanlıkları, ölçeklerin güvenilirlik analizi, araştırma değişkenleri için tanımlayıcı istatistikler, açıklayıcı faktör analizi ve çoklu regresyon analizi ile analiz edilmiştir. Sonuçta, algılanan kullanışlılık ve yenilikçiliğin, tüketicilerin mobil ticarete yönelik tutumu ve mobil ticareti kullanma niyetleri üzerinde önemli etkileri olduğu ortaya çıkmıştır.

Anahtar Kelimeler: Mobil Ticaret, Teknoloji Kabul Modeli, Algılanan Risk, Yenilikçilik

TABLE OF CONTENTS

LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
LIST OF ABBREVIATIONS.....	xi
1. INTRODUCTION.....	1
2. THEORETICAL BACKGROUND AND LITERATURE REVIEW.....	3
2.1 THE CONCEPT OF MOBILE COMMERCE AND ITS DEVELOPMENT..	3
2.2 THEORETICAL BACKGROUND OF TECHNOLOGY ACCEPTANCE MODEL	4
2.2.1 Technology Acceptance Model	5
2.2.1.1 Perceived ease of use	6
2.2.1.2 Perceived usefulness.....	7
2.2.1.3 Consumers' attitude towards mobile commerce.....	8
2.2.1.4 Consumers' intention to use mobile commerce.....	9
2.2.2 Other Technology Acceptance Models	9
2.2.2.1 Innovation diffusion theory	10
2.2.2.2 Theory of reasoned action	12
2.2.2.3 Theory of planned behavior	14
2.2.2.4 Extended technology acceptance model	15
2.2.2.5 Unified theory of acceptance model.....	17
2.3 LITERATURE REVIEW ON TECHNOLOGY ACCEPTANCE MODEL...	18
2.4 CONSUMER INNOVATIVENESS	21
2.5 PERCEIVED RISK	22
2.6 CONCEPTUAL MODEL AND DEVELOPMENT OF THE HYPOTHESIS.....	24
2.6.1 The Relationship Between Perceived Ease of Use and Consumers' Attitude Towards Mobile Commerce.....	24
2.6.2 The Relationship Between Perceived Ease of Use and Consumers' Intention to Use Mobile Commerce	25

2.6.3 The Relationship Between Perceived Usefulness and Consumers' Attitude Towards Mobile Commerce.....	27
2.6.4 The Relationship Between Perceived Usefulness and Consumers' Intention to Use Mobile Commerce	28
2.6.5 The Relationship Between Innovativeness and Consumers' Attitude Towards Mobile Commerce.....	29
2.6.6 The Relationship Between Innovativeness and Consumers' Intention to Use Mobile Commerce.....	31
2.6.7 The Relationship Between Perceived Risk and Consumers' Attitude Towards Mobile Commerce.....	32
2.6.8 The Relationship Between Perceived Risk and Consumers' Intention to Use Mobile Commerce.....	33
3. RESEARCH METHODOLOGY	35
3.1 RESEARCH OBJECTIVES	35
3.2 RESEARCH LIMITATIONS.....	35
3.3 RESEARCH DESIGN	36
3.3.1 Pre-Test of The Research.....	36
3.3.2 Research Variables	36
3.3.3 The Scales, The Questionnaire, Data Collection Method and The Sampling Process.....	37
4. RESEARCH FINDINGS.....	39
4.1 DEMOGRAPHIC PROFILE OF THE PARTICIPANTS.....	39
4.2 MOBILE COMMERCE USAGE HABITS OF PARTICIPANTS	40
4.3 RELIABILITY ANALYSIS OF SCALES.....	41
4.4 DESCRIPTIVE STATISTICS FOR RESEARCH VARIABLES.....	42
4.5 EXPLORATORY FACTOR ANALYSIS	44
4.6 REGRESSION ANALYSIS	48
4.7 EVALUATION OF RESEARCH FINDINGS	52
4.7.1 Managerial Implications	55
4.7.2 Implications for Future Research	55
5. CONCLUSION.....	57
REFERENCES.....	60

APPENDICES	75
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LIST OF TABLES

Table 4.1: Demographic Profile of Participants.....	399
Table 4.2: Most Frequently Used Mobile Commerce Applications	40
Table 4.3: Most Frequently Purchased Product Categories	41
Table 4.4: Reliability scores of scales.....	42
Table 4.5: Descriptive Statistics for Scales Used in the Study	43
Table 4.6: Overall Mean Scores and Standard Deviations of Scales Used in the Study	44
Table 4.7: KMO and Bartlett's Test for Perceived Usefulness.....	45
Table 4.8: KMO and Bartlett's Test for Perceived Ease of Use	45
Table 4.9: KMO and Bartlett's Test for Perceived Risk.....	46
Table 4.10: KMO and Bartlett's Test for Innovativeness	46
Table 4.11: KMO and Bartlett's Test for Consumers' Attitude Towards Mobile Commerce	47
Table 4.12: KMO and Bartlett's Test for Consumers' Intention to Use Mobile Commerce	47
Table 4.13: Total Variance Explained	48
Table 4.14: Regression Analysis: Model Summary for Consumers' Attitude Towards Mobile Commerce	48
Table 4.15: ANOVA for Consumers' Attitude Towards Mobile Commerce.....	49
Table 4.16: Coefficients of Independent Variables for Consumers' Attitude Towards Mobile Commerce	50
Table 4.17: Regression Analysis: Model Summary for Consumers' Intention to Use Mobile Commerce	50
Table 4.18: ANOVA for Consumers' Intention to Use Mobile Commerce	51
Table 4.19: Coefficients of Independent Variables for Consumers' Intention to Use Mobile Commerce	51

LIST OF FIGURES

Figure 2.1: Technology Acceptance Model	6
Figure 2.2: Innovation Decision Process	11
Figure 2.3: Adopter Categorization Based on Innovativeness.....	12
Figure 2.4: Theory of Reasoned Action.....	13
Figure 2.5: The Theory of Planned Behavior.....	15
Figure 2.6: Extended Technology Acceptance Model	16
Figure 2.7: Unified Theory of Acceptance and Use of Technology	18
Figure 2.8: Conceptual Research Model.....	34

LIST OF ABBREVIATIONS

3G	: Third Generation of Mobile Telephony
4G	: Fourth Generation of Mobile Telephony
AU	: Actual System Use
AT	: Attitude Towards Using
bi	: Beliefs
BI	: Behavioral Intention
B2C	: Business-to-Consumer
DOI	: Diffusion of Innovations
ei	: Evaluation of The Outcomes
IDT	: Innovation Diffusion Theory
mci	: Motivation to Yield
nbi	: Normative Beliefs
PBC	: Perceived Behavioral Control
PEOU	: Perceived Ease of Use
PU	: Perceived Usefulness
SCT	: Social Cognitive Theory
SN	: Subjective Norm
TAM	: Technology Acceptance Model
TAM2	: Extended Technology Acceptance Model
TPB	: Theory of Planned Behavior
TRA	: Theory of Reasoned Action

1. INTRODUCTION

Although e-commerce continues to grow rapidly, constantly evolving technology promises to provide much more value than e-commerce itself (Clarke 2001). Mobile devices continue to make this possible. For many years, mobile devices were only used for communication and entertainment such as voice applications and gaming. However, over the last decades, the transition to digital devices and information-based applications creates a new way of growth in commerce through mobile commerce (Kini and Thanarithiporn 2004). Mobile commerce can be interpreted in a variety of ways. The description used in this study is that a commerce carried out using a mobile device that is connected to a cellular or Wi-Fi. Clarke (2001) states that a mobile interface has considerably more benefit than an e-commerce platform due to its ubiquity, convenience, localization, and personalization. These benefits create a bridge between retailer offerings and consumer purchases by determining how the retailer meets the consumer needs. Furthermore, it is expected that, as technology converges and the number of applications increases, mobile commerce will become an important channel (Clarke 2001).

Consumers' usage of smartphones has been an important tool in brand advertisements and marketing campaigns (Gao et al. 2012). As mobile technology advances, businesses all over the world have begun to use not only short messages, but also other services delivered by mobile devices. With the widespread use of smartphones, technical advancements have influenced new marketing platforms. These advancements in technology impact both corporations and consumers, making smartphone shopping applications more appealing. Consumers can conveniently balance their tastes for corporations' products and services, and companies can sell their goods and services anytime they choose. Innovative media platforms also increased the potential of reaching consumers, allowing for more customized products and sales with more content and meaning.

The Covid-19 (coronavirus) pandemic, which has become a global epidemic, began in December 2019 in Wuhan, China, and has since expanded to several places across the

world. During Covid-19, consumers' time spent has significantly reduced in the market. This situation led consumers to search for new shopping platforms. Thus, mobile commerce has become more important. The purpose of this study is to investigate the factors that influence consumer acceptance of mobile commerce.

The literature review that follows presents an opportunity to know about the advancement of mobile commerce based on the Technology Acceptance Model and other adoption models. A research model is constructed based on the relationship between consumer innovativeness, perceived risk and Technology Acceptance Model's variables which are perceived usefulness, perceived ease of use, consumers' attitude towards mobile commerce and consumers' intention to use mobile commerce. This section explains the aim of the study as well as the variables that will be used to determine whether or not mobile commerce will be accepted. This study contributes to the literature by examining the factors affecting mobile commerce acceptance in Turkey. Moreover, as a result of the online pre-test with 50 participants, Trendyol which is one of the biggest mobile commerce applications in Turkey was chosen to create the questionnaire. The data of this study was collected by an online survey which was conducted by 250 participants.

Consequently, this study seeks to fill the gap in the mobile commerce acceptance in Turkey. Furthermore, this study also aims to understand the consumers' expectations and needs in the light of several factors.

2. THEORETICAL BACKGROUND AND LITERATURE REVIEW

This chapter focuses on the concept of mobile commerce and theoretical background of technology acceptance model. Moreover, the conceptual model and development of the hypothesis are constructed based on their relations.

2.1 THE CONCEPT OF MOBILE COMMERCE AND ITS DEVELOPMENT

After e-commerce stepped into user's daily life, it has been seen that the impact of e-commerce on businesses has continuously increased. Moreover, the evolution of wireless networks caused the creation of the latest invention, mobile commerce. It can be concluded that mobile commerce or mobile commerce is derived from e-commerce (Bushell 2000).

Mobile commerce can be defined as conducting commercial operations via mobile devices over a network of wireless technologies (Ngai and Gunasekaran 2003; Barnes 2002; Coursaris and Hassanein 2002). Mobile devices use wireless networks in different ways such as wireless application protocol, notebooks, short message systems, and personal digital assistants, and laptops (Antypas and Leung 2001). Moreover, mobile commerce framework has been constructed with five different levels which are mobile applications, wireless network infrastructure, wireless user infrastructure, and mobile software (Gunasekaran and Ngai 2003). Since mobile commerce is supported by wireless networks and various mobile devices, mobile commerce can be categorized into two main dimensions such as transactions (i.e., purchasing, promotions) and content delivery (i.e., marketing, notification, reporting) (Antypas and Leung 2001). Since mobile device usage is continuously increasing all around the world and wireless technologies keep developing, the mobile commerce applications are becoming more attractive for all businesses (Hung et al. 2003).

According to Saxena's (2020) report in 2019, it is seen that mobile commerce revenue has doubled since 2016 and it has a yearly average increase of almost 33.8 percent.

Moreover, mobile commerce revenue is estimated to reach 2.32 trillion dollars by 2020, and it is also estimated to increase by 33 percent and reach 3.56 trillion dollars in 2021 (Saxena 2020).

According to Loesche's (2018) report, mobile commerce share in e-commerce is 28.2 percent in 2016. Its share has increased in the next three years and reached 52.4 percent in 2019. When mobile commerce and e-commerce growth is compared, it is seen that mobile commerce growth in 2019 which is 29 percent is higher than e-commerce growth in 2019 which is 22 percent (Loesche 2018). From these statistics, it is forecasted that mobile commerce share in e-commerce will reach 72.9 percent by 2021 which is almost three out of four of all e-commerce businesses (Mohsin 2020).

According to mobile phone usage analysis, 5.07 billion people are using mobile phones globally. Daily mobile phone usage is 5.4 hours for an average American (Kemp 2019). In one of the latest publications, it is reported that 49 percent of users use their mobile phones for shopping (BrizFeel 2020).¹ Moreover, 60 percent of consumers use social media to be informed by new services and products. In 2020, 55 percent of users on mobile phones made a purchase after seeing an advertisement of a service or product on social media (Saxena 2020). According to mobile shopping applications statistics, 77 percent of online shoppers use mobile commerce for fun and make impulsive buying (Pixel Union Shop 2019).²

2.2 THEORETICAL BACKGROUND OF TECHNOLOGY ACCEPTANCE MODEL

In the following section, theories that are the basis of the concept of mobile commerce in the literature are discussed. Some of these theories are Ajzen and Fishbein's (1975) studies about Theory of Reasoned Action, Davis's (2000) research about Technology Acceptance Model, Venkatesh and Davis's (2000) studies about the variables of Technology Acceptance Model and Hauser and Shugart's (1980) research about the dimensions of Technology Acceptance Model.

¹ BrizFeel (2020). 50 Consumers Online Shopping Behavior Trends [Survey] 2020.

² Pixel Union Shop (2019). 22 must-know mobile ecommerce stats for 2020.

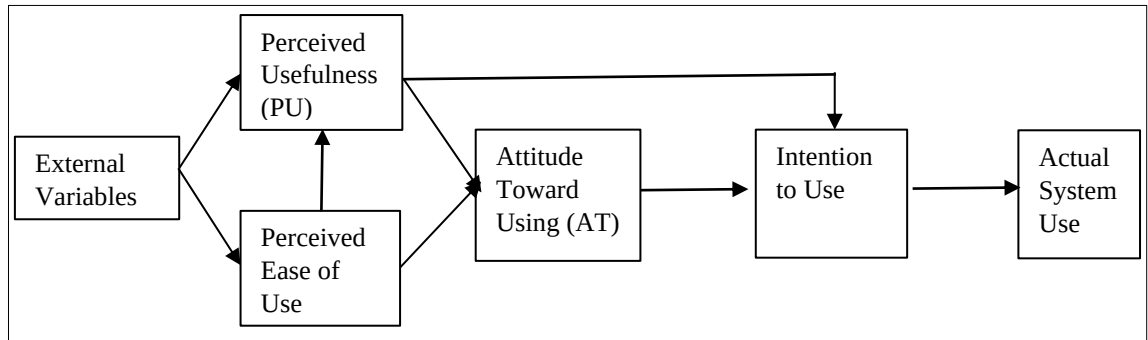
2.2.1 Technology Acceptance Model

Technology Acceptance Model (TAM) is developed from Theory of Reasoned Action (TRA) which is studied by Ajzen and Fishbein's (1975). The main concern of the Theory of Reasoned Action model is the relationships of variables which are beliefs, intentions, behaviors and attitudes. Moreover, the Theory of Reasoned Action model includes three principles which are separating attitudes and beliefs, how attitudes, behaviors and beliefs are linked by an external stimulus and the measurement of behavior relevant attitudes (Fishbein and Ajzen 1975). Davis proposed the Technology Acceptance Model in 1989 and let many other researchers study the subject into different academic disciplines (Yang 2005). This model has been implemented to estimate and understand the acceptance and adoption of various technologies in several studies about mobile education (Tan et al. 2012), electronic banking (Al-Smadi 2012), online shopping (Vijayasarathy 2004). According to Venkatesh and Davis (2000) study, it is shown that the usage of behavior and intention is resulted in a range of 40 percent of variances when Technology Acceptance Model is used (Venkatesh and Davis 2000).

Technology Acceptance Model is constructed by perceived ease of use (PEOU) and perceived usefulness (PU) (Figure 2.1). Perceived ease of use is the variable where the user expects to reach the target effortlessly. Perceived usefulness is described as the probability of an increase in performance by using an application or a system (Hauser and Shugan 1980).

Attitudes and usage are linked by other variables like perceived usefulness and perceived ease of use (Hauser and Shugan 1980). Moreover, consumers' intention to use a technology seen as jointly defined by perceived usefulness and users' attitude towards adopting it (Davis et al. 1989). Consumers' intention to use a technology is defined as actual system use (AU) (Wang and Wu 2005).

Figure 2.1: Technology Acceptance Model



Resource: Davis, F., Bagozzi, R., & Warshaw, P. ,1989. User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science* 35(8), p. 982-1003.

2.2.1.1 Perceived ease of use

Perceived ease of use (PEOU) is described as a users' trust who is using a specific system effortlessly (Davis 1989). If a technology or a system is easier to use, then it means that a person puts less effort to accomplish the given task (Davis et al. 1992). Effort is known as a finite resource (Radner and Rothschild 1975). When less effort is shown on a specific subject, the more can be split into other subjects and that leads to improved overall work performance and capacity (Davis et al. 1989). Moreover, even if the outcomes of two different systems are equal, the user always chooses the one with less effort to reach the task. (Davis 1989).

In the Technology Acceptance Model, perceived ease of use significantly affects attitude (Davis et al. 1989). In the academic literature, various research has proved that perceived ease of use and users' intention to use a system are positively correlated (Davis and Venkatesh 2000) and perceived ease of use can be defined as the most predictive factor that is important for users' intention to adopt to the system (Agarwal and Karahanna 2000). In addition, some of the researchers have linked perceived ease of use with difficulty (Rogers 1983) and planned endeavor (Venkatesh et al. 2012).

Perceived ease of use is an essential component in a variety of systems such as 3G (Liao et al. 2007) and mobile commerce (Lin and Luarn 2005). Perceived ease of use has a positive effect on the adoption of mobile commerce (Wei et al. 2009). Moreover,

perceived ease of use demonstrates that when a new technology provides easier use to a person, it would give him/her comfort while using it and would be free of boring work (Hosein 2009).

Perceived ease of use is a strong index for a consumer's decision in the way of meta perceived usefulness. If a technology is easier to use, then it makes its usefulness easier for users. Therefore, users become keener to use the system (Zhang et al. 2012). Research about meta-analysis of adoption shows that 46 studies out of 58 had investigated the elements that impact the readiness of users to use the system. From these 46 studies, 30 articles analyzed the correlation of perceived ease of use and consumers' intention to use a recent system. The rest, 16 articles analyzed the relationship between perceived ease of use and consumers' attitude towards a recent system (Zhang et al. 2012).

2.2.1.2 Perceived usefulness

Perceived Usefulness (PU) is defined as “The degree to which a person believes that using a particular system would enhance his or her job performance” (Davis 1989). In the academic literature, there are several studies about perceived usefulness. For example, Robey (1979) adopted the instrumentality model from Porter and Lawler's studies for the usage of computers in the workplace (Robey 1979). Moreover, Robey and Zeller (1978) found that the perceived usefulness can create an important difference in many departments within the same company (Robey and Zeller 1978).

In the Technology Acceptance Model, users' intention to use a technology and their attitude towards the technology is directly affected by perceived usefulness (Davis et al. 1989). In addition, Meta-analysis studies about adoption of the mobile commerce show that perceived usefulness and users' intention to use a technology are positively correlated (Zhang et al. 2012). 38 studies out of 58 have shown that these two factors are very dominant when compared to the others. These studies also proved that perceived usefulness influences user's willingness to adopt mobile commerce services (Zhang et al. 2012).

Perceived usefulness influences users' ideas on mobile commerce in terms of acceptance and adoption (Davis 1989; Davis and Venkatesh 2000). Perceived usefulness has been found to play a substantial influence for the new systems' adoption in several research. Some of those studies also showed that perceived usefulness is a significant determinant for mobile commerce adoption (AlSoufi and Ali 2014; Deb and Lomo-David 2014; Akturan and Tezcan 2012 and Dai and Palvia 2009).

Since perceived usefulness can impact users' intention about acceptance and adoption of mobile commerce, its significant impact on mobile commerce and information systems must be discussed (Khalifa and Shen 2008). Thus, perceived usefulness is an essential predictor of mobile commerce acceptance and adoption (Wei et al. 2009; Khalifa and Shen 2008). Results of various studies have provided evidence for positive correlation between the willingness to use mobile commerce and perceived usefulness (Wei et al. 2009).

2.2.1.3 Consumers' attitude towards mobile commerce

Ajzen and Fishbein (1977)'s stated that an individual's attitude is held toward certain components of their reality, such as a physical item, another person, or a behavior (Ajzen and Fishbein 1977). Moreover, the intention of a user to a specified object is measured by users' behavior. This behavior can be named as the attitude, feelings of favorable or unfavorable of a user about performing the behavior (Ajzen and Fishbein, 1975).

The social psychology literature has shown that attitude has both cognitive and affective constituents (Millar and Tesser 1986). The cognitive constituents explain the relationship between attitude and other ideas (Burnkrant and Bagozzi 1979). The emotional constituents measure the strength of one's emotional attachment to attitude (Burnkrant and Bagozzi 1979).

A consumer's attitude towards a technology is linked to his/her set of beliefs about the subject. Although there might be many beliefs about the system, only a relatively small part of it serves as main factors of his/her attitude (Fishbein and Ajzen 1975). Moreover, users' intention to use a system is directly influenced by attitude (Kanchanatane 2014).

2.2.1.4 Consumers' intention to use mobile commerce

Intention to use is defined as users' intention on a probability that involves the relation between user and the system (Fishbein and Ajzen 1975).

Perceived ease of use is an important secondary factor of consumers' intention and perceived usefulness is also a primary factor for perceived ease of use according to the Technology Acceptance Model (Venkatesh and Davis 2000). Moreover, some studies indicate that consumers' intention to use the technology is affected by perceived usefulness, perceived ease of use, consumers' attitude towards the technology and perceived risk (Ha 2020; Chao 2019; Weng et al. 2018). For example, Wheng (2018)'s research shows that when equipment is installed to create multimedia material and manpower is provided to organize these materials, the materials will be created with extra manpower as teachers will provide the teaching content. This will reduce the burden on teachers to create materials and they can make appropriate content for the classroom which will increase their intention to use materials and perceived ease of use (Weng et al. 2018).

The propensity of users to use a system indicates their intention to use the system. For instance, the consumer's experience in existing information technology and the ease of use perceived by the people who use online banking affect their intention to use online banking (Muchran et al. 2018).

2.2.2 Other Technology Acceptance Models

In this section, adoption models that are referred as a basis to explain mobile commerce acceptance other than the Technology Acceptance Model mentioned in the previous section are examined. These models are Innovation Diffusion Theory (IDT), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Extended Technology Acceptance Model (TAM2) and Unified Theory of Acceptance and Use of Technology (UTAUT).

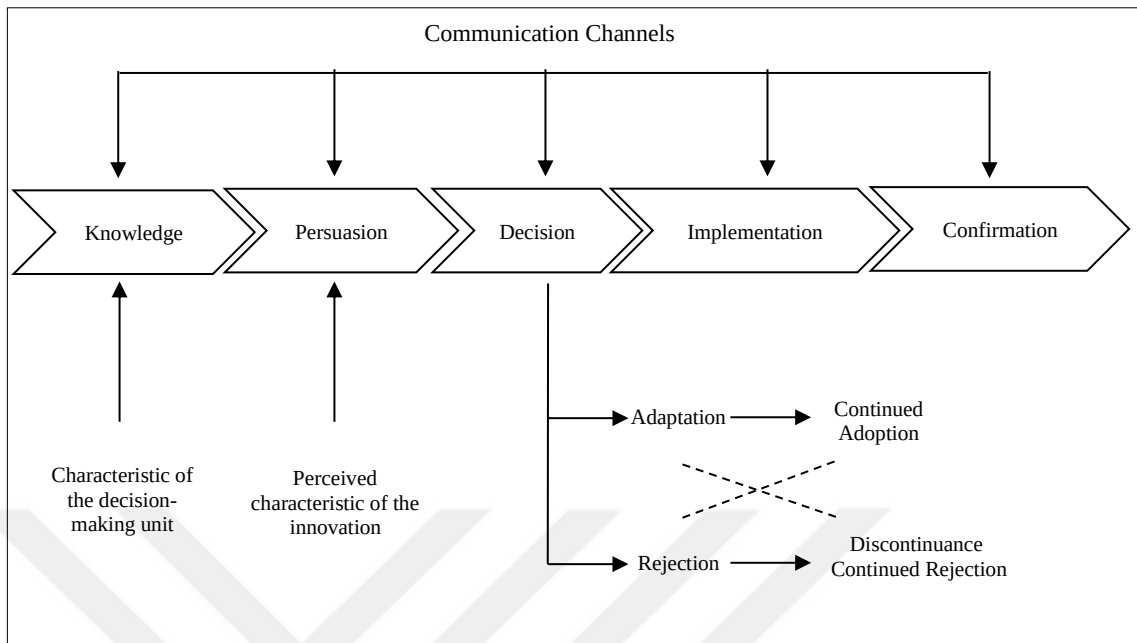
2.2.2.1 Innovation diffusion theory

Diffusion is the method through which an invention is conveyed across members of a social system over time through certain routes (Rogers 1983). As can be seen from this definition, Rogers (1983) has addressed the diffusion's four main factors. These are time, communication channels, social system and innovation. Innovation is the perception of an adoption unit or an individual as new to an object, an idea or an application. The newness in the innovation determines whether an idea is accepted or rejected by others (Rogers 1983). The process of change or social change occurring in the social system is also diffusion. Social change occurs when new ideas are formed, adopted, or rejected (Rogers 1983).

The process that participants create with the aim of reaching mutual understanding and therefore share information with each other is called communication. Communication in diffusion is linked to new ideas. Therefore, there can be uncertainty due to lack of information and structure (Rogers 1983). Time in diffusion is related to three different subjects which are individual's adoption of innovativeness, innovation decision process, and rate of adoption of an invention in a system (Rogers 1983). Moreover, the innovation decision process respectively consists of knowledge, persuasion, decision, implementation, and confirmation (Figure 2.2).

Knowledge is an individual's understanding of how the existence of innovation works. Persuasion emerges as a result of a favorable or unfavorable attitude toward a new product or service. Decision occurs as a result of a person taking actions such as adopting an innovation or not. Implementation occurs when innovation is started to use by an individual. Confirmation happens if an individual wants to strengthen an innovation decision that has already been taken. As a result of this situation, if the individual suffers from contradictions, he can reverse his previous decision (Rogers 1983). Moreover, there are five perceived characteristics of innovations which are compatibility, complexity, observability, relative advantage, and trialability (Rogers 1983).

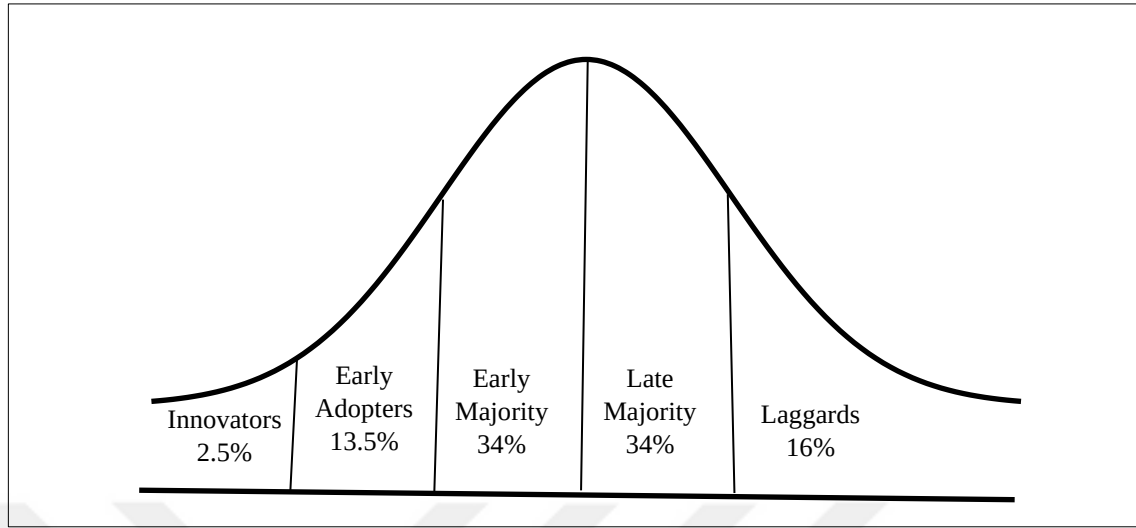
Figure 2.2: Innovation Decision Process



Resource: Rogers, E., 1983. Diffusion of Innovations. New York: A Division of Macmillan Publishing Co., Inc.

Rogers' (1983) research about diffusion concluded that there are five adopter categories which are shown in Figure 2.3. These categories are respectively innovators, early adopters, early majority, late majority and laggards. It is said that they are active information seekers for innovators. They first adapt to the new information in the system (Rogers 1983). In addition, Rogers stated that the relative time-based state in which an innovation is adopted is the separation of system members according to the adopted categories and the measurement of innovation (Rogers 1983).

Figure 2.3: Adopter Categorization Based on Innovativeness



Resource: Rogers, E., 1983. Diffusion of Innovations. New York: A Division of Macmillan Publishing Co., Inc.

2.2.2.2 Theory of reasoned action

The basis for Theory of Reasoned Actions (TRA) is generated by the distinction between intentions, beliefs, behaviors, and attitudes. However, the actual concern of the Theory of Reasoned Actions is the relationships between these variables (Ajzen, 1975).

In the early model of Theory of Reasoned Actions, two types of beliefs are considered (Figure 2.4). Firstly, if users experienced a behavior before then they hold beliefs with positive or negative outcomes. These outcomes and beliefs are supposed to specify users' attitude towards performing the behavior. Users' attitudes are also expressed as their positive or negative evaluation about the behavior (Ajzen and Fishbein 2010). Moreover, users' attitude towards a technology is defined by their notable beliefs on the outcomes multiplied by the evaluation of these outcomes:

$$A = \sum b_i e_i \quad (2.1)$$

Beliefs (b_i) can be defined as the user's nominative possibility that carrying out the target behavior will result in outcomes i . Moreover, the evaluation of the outcomes (e_i) can be defined as the evaluation response to the outcomes (Ajzen and Fishbein 1975).

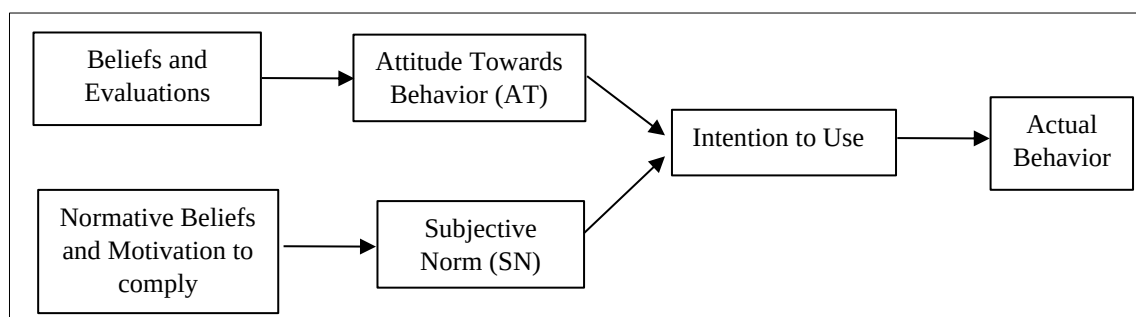
Finally, users set their beliefs according to the important groups or individuals' approvals or disapprovals about performing the behavior. They decide to apply or not apply the behavior considering the important groups or individuals' thoughts in their lives. This situation results in social pressure for users' engagement of performing the behavior (Ajzen and Fishbein 2010). This creates subjective norm, which is named by SN, is defined by the multiplication of consumers' normative beliefs (nbi) such as noticed expectations of groups or consumers, and their motivation to yield (mci) with outcomes (Ajzen and Fishbein 1975):

$$SN = \sum nbi \ mci \quad (2.2)$$

Since the Theory of Reasoned Action is a general model, it does not determine the user's beliefs that are operative for a specific behavior. The researchers who use the Theory of Reasoned Action, must describe the beliefs which are remarkable for the subjects related to the behaviors (Ajzen and Fishbein 1975).

In the Theory of Reasoned Action Model, consumers' intention specifies the actual behavior which is an additive function of subjective norms (users' perceived influences) and attitudes (a favorable or unfavorable assessment of the behavior that is performed). To conclude, an increase in subjective norm or attitude results in a stronger intention about performing the behavior (Nguyen et al. 2018; Fishbein 2008).

Figure 2.4: Theory of Reasoned Action



Resource: Davis, F., Bagozzi, R., & Warshaw, P. ,1989. User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science* 35(8), p. 982-1003.

2.2.2.3 Theory of planned behavior

The Theory of Reasoned Action model is limited in describing behaviors that are not under an individual's voluntary control although useful in predicting social behavior. Because of that reason, the Theory of Planned Behavior (TPB) model is presented by Ajzen (1991) as an extension of the Theory of Reasoned Action model. In this model, Ajzen added the Perceived Behavioral Control (PBC) structure different from the Theory of Reasoned Action model and thus improved the explanatory power (Ajzen 1991).

Perceived Behavioral Control is the ease or difficulty in carrying out a particular behavior and the amount of control possessed to achieve that behavior (Teo and Schaik 2012). Moreover, due to external obstacles and perceived and actual personal inadequacies, the ability to perform a certain behavior can interfere with the perception of control that a person has over the action and consequences of that behavior (Teo and Schaik 2012).

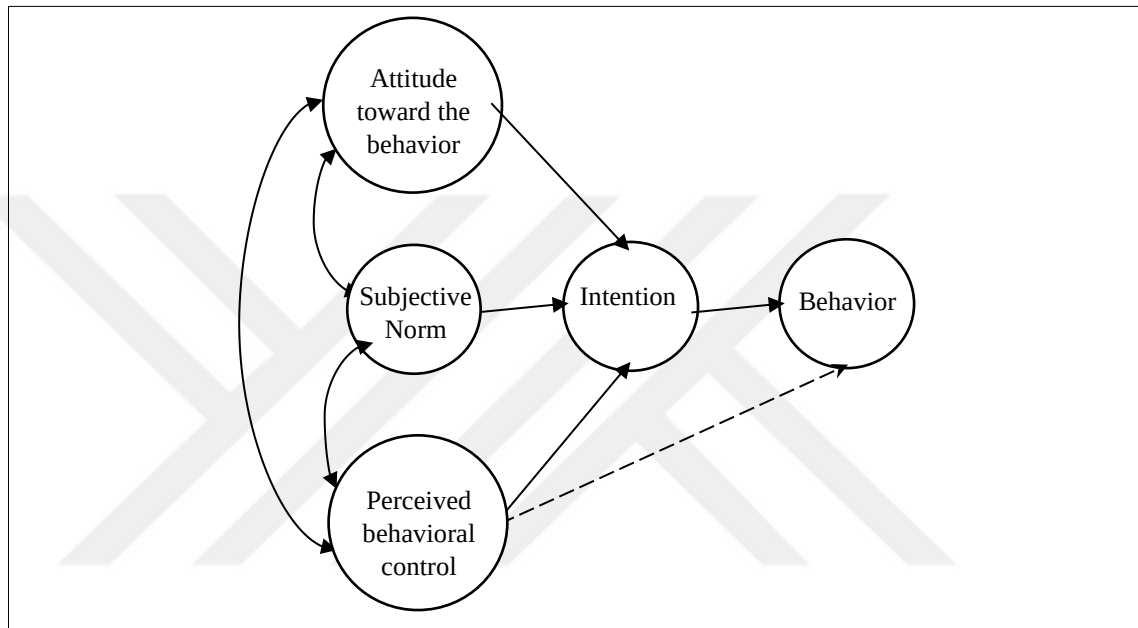
The current version of Perceived Behavioral Control is most coherent with Bandura's research which has the perceived self-sufficiency with judgements of how users perform the action path to reach the desired goals (Bandura 1982). Bandura and other researchers (e.g., Hardy, Adams, Bandura and Howells 1980; Beyer, Adams, and Bandura 1977) showed that self-confidence strongly affects users' behavior. Emotional reactions, ways of thought, preparation, effort, and choices are all affected by self-sufficiency (Bandura 1982). The Theory of Perceived Behavioral Control places the foundation of self-sufficiency as a more comprehensive structure of the connection between attitudes, behaviors, beliefs, and intentions.

According to the Theory of Planned Behavior Model, Perceived Behavior Control is a variable that influences behavior through intention and has a direct impact on behavior. In addition, indirect influence is considered to have motivational consequences for Perceived Behavior Control's behavioral intentions (Madden et al. 1992).

As can be seen from Figure 2.5, the central factor of the Theory of Planned Behavior model is users' intention towards behavior. Moreover, the elements that impact a

behavior's motivation are captured by intentions. They indicate that people plan how willing they are to try and strive to achieve the behavior (Ajzen 1991). In addition, attitude towards behavior, subjective norm and perceived behavior control factors in the Theory of Planned Behavior explain 39 percent to 50 percent of the variance in consumers' intention as a result of several studies (Conner et al. 2001).

Figure 2.5: The Theory of Planned Behavior



Resource: Ajzen, I. ,1991. The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes* 50, p. 179-211.

2.2.2.4 Extended technology acceptance model

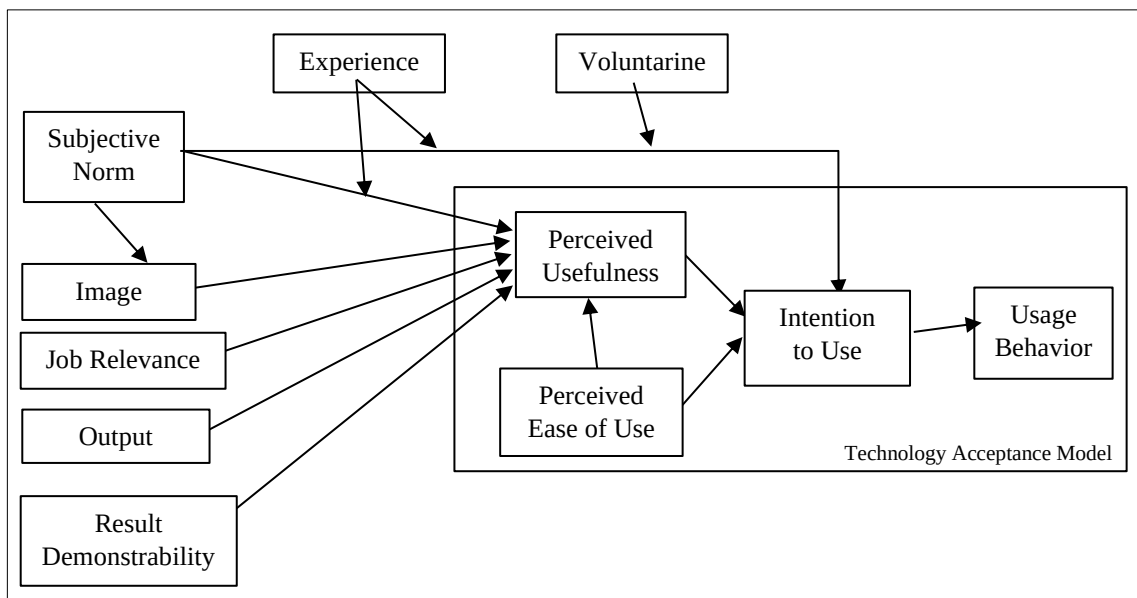
Davis and Vankatesh (2000) introduced the Extended Technology Acceptance Model (TAM2) for the purpose of expanding the perceived usefulness of Technology Acceptance Model and Technology Acceptance Model to include more fundamental determinants of the intended use structures and to learn how the impacts of these determinants evolve over time in relation to the target system with the increasing user experience (Davis and Vankatesh 2000).

Figure 2.6 shows the Extended Technology Acceptance Model which is the proposed model by Davis and Vankatesh (2000). It includes additional theoretical structures

covering social influence processes (volunteering, subjective norm and image) and cognitive instrumental processes (output quality, perceived ease of use, outcome demonstrability and job relevance).

According to Davis studies, it is concluded that the impacts of social impresses are coherent with Technology Acceptance Model 2. Users adopt a system to improve their job performances to influence other people in the work environment and to gain status eventually. Subjective norms, volunteering, and image are three interrelated social forces affecting an individual who is faced with rejecting or adopting a new system (Davis and Vankatesh 2000). Perceived ease of use, output quality, result demonstrability and job relevance are defined as four cognitive instrumental determinants of perceived usefulness. People build their perceived usefulness judgments, in part, by cognitively comparing what they must do in their work with what a system can do. Davis showed that the results of system use in an individual's job goals (job relevance) cognitively match the judgments about the usefulness of a system, and the quality of the output gains more importance in proportion to the job relevance of a system (Davis and Vankatesh 2000).

Figure 2.6: Extended Technology Acceptance Model



Resource: Venkatesh, V., & Davis, F., 2000. A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science*, p. 186-204.

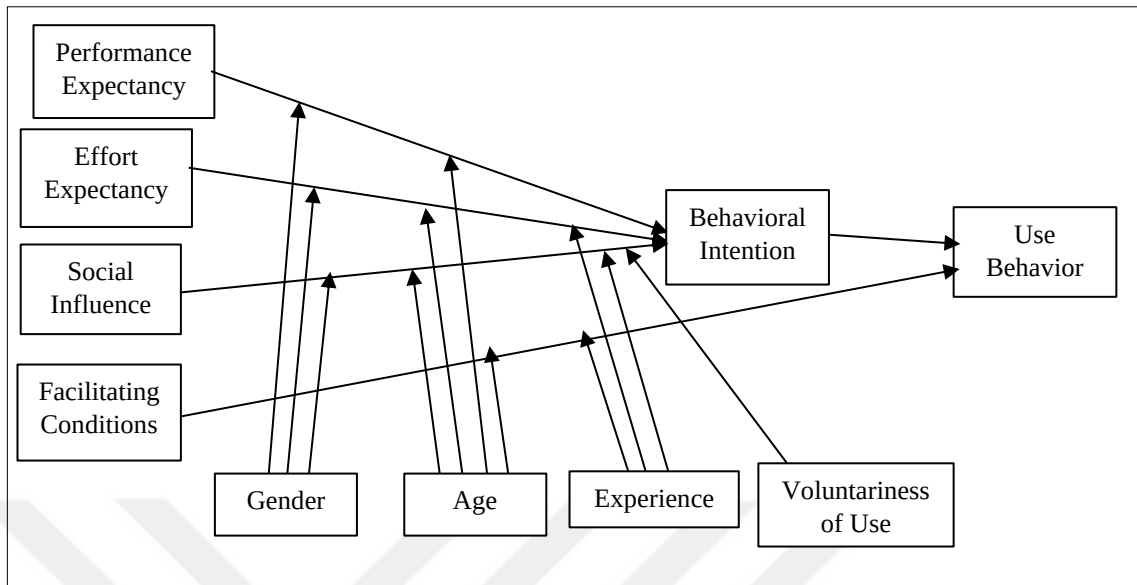
2.2.2.5 Unified theory of acceptance model

For predicting user adoption of information technologies, Vankatesh (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) (Vankatesh 2003). This model consists of integration of eight theories which are theory of reasoned action (TRA), Technology Acceptance Model (TAM), Innovation Diffusion Theory (IDT), the Theory of Planned Behavior (TPB), a model of combining the Theory of Planned Behavior (TPB) and Technology Acceptance Model, the Model of Personal Computer Utilization, the Motivational Model and Social Cognitive Theory (SCT).

According to Venkatesh's studies (2003), social influence, effort expectancy and performance expectancy determine consumers' intention to use a new technology. As a result, consumers' intention to use a technology impacts on behavior towards user adoption by facilitating conditions (Figure 2.7). Performance expectation occurs when the person thinks that the system, she/he uses will help her/his job performance. The ease of use of the system creates the expectation of effort. The effect of others' views on the adoption of a particular system is social influence (Vankatesh 2003).

The Unified Theory of Acceptance and Use of Technology Model has been the subject of many studies in terms of explaining user adoption to information technologies, such as Park et al. (2007)'s mobile technology, Zhou (2011)'s mobile banking and Kijisanayotin et al. (2009)'s health information technology studies.

Figure 2.7: Unified Theory of Acceptance and Use of Technology



Resource: Vankatesh, V., 2003. User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly* Vol.27 No.3, p. 425-478.

2.3 LITERATURE REVIEW ON TECHNOLOGY ACCEPTANCE MODEL

In this section, a literature review on the studies based on Technology Acceptance Model are conducted. Moreover, literature research on Technology Acceptance Model 's relationship with mobile commerce and online shopping, and its applicability to this study is discussed.

One of the studies on Technology Acceptance Model is Yang's work with mobile technology adoption in Singapore. Yang's (2005) research was studied in Singapore due to high penetration rates in mobile phone (83.1 percent) and internet (42.92 percent) applications, and so a questionnaire was created to get the answers of Singaporean consumers on perceptions of mobile commerce. Yang (2005) showed that the results of his study are consistent with previous Technology Acceptance Model studies in terms of the relationships between users' attitude towards a technology, perceived ease of use and perceived usefulness. However, it also showed that the relationship between perceived ease of use and perceived usefulness in the study was not important. In addition, if there is an insignificance between users' attitude towards a technology and perceived ease of use, perceived ease of use has shown that technologies that are heard but not tried

firsthand are not a good measure for the user. But it supported Technology Acceptance Model's robustness in examining the premises of consumer adoption of different information technologies (Yang 2005).

Another research conducted in the field of Technology Acceptance Model and mobile commerce is Wang and Wu's (2005) study which investigates what factors influence consumer perceptions of mobile commerce and its acceptance in the business-to-consumer (B2C). In this study, they created a model that integrates Innovation Diffusion Theory with the Extended Technology Acceptance Model, which is an improved version of the Technology Acceptance Model. Moreover, the results also showed that perceived usefulness and perceived ease of use indirectly affected actual use indirectly through behavioral intention to use. This result is consistent with Davis's work (Wang and Wu 2005).

According to Vijayasarathy's (2004) research on the usage of Technology Acceptance Model in on-line shopping. In his research, a business to consumer commerce has been studied by collecting the data from 281 consumers. After they analyzed the data, it is concluded that new technologies and systems in on-line shopping must be matched with users' beliefs such as perceived usefulness, perceived ease of use, perceived risk, intention and compatibility. The positive correlation between these beliefs and the features of new technology help to create more acceptable and adaptable technology for users (Vijayasarathy 2004).

Another study is He and Wang's (2012) research which is related to user's adoption of mobile commerce by using Technology Acceptance Model. In this study, an integrated model was created based on the Technology Acceptance Model and the task Technology Adaptation Model. In this model, the relationship between perceived fit and perceived value with perceived usefulness, perceived safety, and users' intention to use a system was examined. As a result of this study, it has been shown that perceived fit has a positive effect on perceived safety and perceived ease. Moreover, the perceived value which mediates the effect of perceived security and perceived usefulness on users' intention to

use mobile commerce has a positive effect on the intention of use of mobile commerce (He and Wang 2012).

Another study conducted on the Technology Acceptance Model is Chi's (2018) study to predict the intention of consumers in China to use mobile commerce in the apparel industry. In this study, he proposed an Expanded Technology Acceptance Model combining website quality and brand value as the factors of perceived ease of use and perceived usefulness and conducted this study with an online questionnaire with 786 appropriate answers. As a result of the research, it has been shown that users' perceived ease of use is significantly affected by brand equity like brand image, brand perceived quality, brand association and brand loyalty. Moreover, consumers' perceived usefulness is enhanced by perceived quality, brand image and brand loyalty. In addition, consumers' attitude towards mobile shopping is positively affected by perceived usefulness and perceived ease of use. Thus, the perceived benefit and positive attitude increase the likelihood and intention of consumers in China to use the mobile apparel business. This study also demonstrates that the quality of the website is also a very significant role for mobile shopping because consumers seek the best usability of mobile shopping for the purpose of meeting the consumer needs of the website (Chi 2018).

Due to the rapid growth of online media marketing, companies have started using mobile services initiatives as part of their business planning practices. According to this, the last study to be mentioned in this section is Lee and Youn's (2019) study of adopting paid mobile media service as a new source of information and communication technologies with integrated mobile services offline and online. In this study, it was focused to investigate the Technology Acceptance Model of value perceptions from the perspective of consumer experiences, and the effects of perceived value on experiences and users' beliefs about paid service, indicating the future use of paid service, were examined in the proposed model. The result of this study shows that behavioral intention towards continuous use of paid mobile media service is positively affected by perceived usefulness and perceived ease of use which are related to use of paid service. Moreover, it has been observed that consumers' encountering negative situations regarding technological barriers negatively affect their beliefs about the ease of use of paid mobile

service. In addition, it has been shown that consumer belief in the perceived usefulness of paid mobile media service was positively affected as a result of the positive mobile media experience of the consumer, on the contrary, the negative consumer experience negatively affected the beliefs of consumers about the ease of use of paid mobile services (Lee and Youn 2019).

2.4 CONSUMER INNOVATIVENESS

In the academic literature, Rogers and Shoemaker (1971) defined innovativeness firstly as the degree to which a user is more prone to adopt new technologies or systems in comparison with his/her social environment. This definition shows that the level of innovativeness can be observed from users' behaviors (Rogers and Shoemaker 1971). Innovativeness is pointed out as an unobservable construct by Midgley and Dowling (1978). They stated that innovativeness is congenital, and it has an abstract level (Midgley and Dowling 1978). Innovativeness can be described as the users' willingness to change and it is advanced for a particular definition of innovativeness (Hurt et al. 1997). Some studies have identified innovativeness as a domain specific concept which may be defined as the user's leaning to a significant category of a new system (Goldsmith and Hofacker 1991). However, a lot of research has shown that there are several components of overall user innovativeness which are looking for novelty, variety and information (Goldsmith 1983; Hirschman 1980). Innovativeness makes users more energetic, communicative, adventurer and curious (Goldsmith 1983).

Comparing the results of several studies and metric effects on validity and reliability of systems can be pointed out by adoption methods. After the adoption period, innovativeness is measured as an illustrator of the users' behaviors (Agarwal and Prasad 1998). Innovativeness is the significant factor for users' adoption and can be studied in two subcategories: global and domain specific innovativeness (Flynn and Goldsmith 1993). Global innovativeness first studied by Kirton (1976) and he stated that users characteristically accept and adapt the systems while others innovate. Users' characteristics determine a lesser or greater degree based on their innovativeness level (Kirton 1976). On the other hand, some studies in academic literature states that global innovativeness remains powerless when adopted to a specific innovation decision

(Goldsmith and Hofacker 1991). General or open processing innovativeness concentrates on a cognitive style that includes the sensorial, attitudinal, and intellectual characteristics of a person (Citrin et al. 2000). Users' behaviors on activities with a limited domain is defined as the domain specific innovativeness. And it is measured via self-report of users such as their personality variables and attitudes (Flynn and Goldsmith 1993). The desire to adopt and learn innovations within a particular area of interest is the innovation specific to the domain or product category, and therefore benefits from a deeper innovation structure that is more significant for users' interest (Citrin et al. 2000). There is inevitable risk and uncertainty due to innovative behavior such as the use of online banking, an individual innovative personality is concerned with risk-taking tendencies (Gerrard and Cunningham 2003).

2.5 PERCEIVED RISK

The uncertainty in the consumer regarding the gain or loss in a specific process is defined as perceived risk (Roselius 1971). Moreover, the concept of risk is explained by the fact that most individuals decide to buy under a certain level of unknown origin about a particular brand and /or product (Murray 1991). There are six facets of perceived risk which are performance, financial, psychological, physical, time and social risk (Peter and Tarpey 1975). These risk types are related to services or products that are used by users, which are financial, performance, physical, time, and social risks (Featherman and Pavlou 2003).

The risk that refers to the net financial loss to a consumer which includes an offering a product of a bad brand choice, the ability to repair, replace, or refund the purchase price is called the financial risk (Horton 1976). Due to financial risk concerns, consumers are insecure about online credit card usage (Forsythe and Shi 2003).

Psychological risk occurs as a result of associating a person's social status or value with a brand or product group and choosing that product or brand group by other people. (Horton 1976). Thus, it may not match the image established by the purchaser of the product.

Time risk means unease due to delays in purchasing products, for example the availability of suitable websites (Forsythe and Shi 2003).

Physical risk is expressed by the unsafe shopping experience, energy spent on shopping, and health threats (Amin and Mahasan 2014).

Performance risk is that when we choose a brand from a certain product class, that product does not show the performance we expect (Horton 1976). Product quality is difficult to measure online, creating a product performance risk (Forsythe and Shi 2003).

Social risk occurs when a person loses self-esteem due to a store's reputation from your social group and friend (Amin and Mahasan 2014).

The perceived risk in mobile commerce is studied by many researchers and mainly categorized into two subjects such as security risk and privacy risk (Abu-Shanab and Ghaleb 2012). Perceptions about security risk can be associated with consumer anxiety about card information, especially in credit card usage (Bhatnagar et al. 2000). According to Hoffman et al. (1998), there is a crucial security problem in the online world which is deficient payment technologies to secure the processes (Hoffman et al. 1998). Harmful software packages threaten the safety of mobile devices and mobile commerce technologies (Ghosh and Swaminatha 2001). Thus, this situation can be expected to affect attitudes towards shopping online (Vijayasathya 2004). In addition, although mobile commerce is an efficient application, users are faced with various security problems while using them (Li et al. 2010). Undertaking the security challenges plays a significant part in users' acceptance towards mobile commerce technologies (Kao 2009). Moreover, in online transactions, users usually provide their personal information to complete their online purchasing which might result in losing the control of their personal information (Featherman and Pavlou 2003). Personal information might be collected, stored, and be used for other purposes (Ghani and Sidek 2009). Many users refuse the adoption of mobile commerce because of these privacy concerns and the invasion of personal information is one of the major reasons for user's refusal (Gadzheva 2007).

2.6 CONCEPTUAL MODEL AND DEVELOPMENT OF THE HYPOTHESIS

The literature review for Technology Acceptance Model, innovativeness and perceived risk enable to build the conceptual research model and develop hypotheses. In this section, the relationship between perceived ease of use and consumers' attitude towards mobile commerce, the relationship between perceived ease of use and consumers' intention to use mobile commerce, the relationship between perceived usefulness and consumers' attitude towards mobile commerce, the relationship between perceived usefulness and consumers' intention to use mobile commerce, the relationship between innovativeness and consumers' attitude towards mobile commerce, the relationship between innovativeness and consumers' intention to use mobile commerce, the relationship between perceived risk and consumers' attitude towards mobile commerce, the relationship between perceived risk and consumers' intention to use mobile commerce are examined. Thus, hypotheses developed depending on these relationships in literature.

2.6.1 The Relationship Between Perceived Ease of Use and Consumers' Attitude Towards Mobile Commerce

When consumers embrace technology advancements, their behavior varies dynamically over time. According Renny et.al's study (2013), the trend of purchasing airline tickets by travel agencies or airline offices is giving way to online ticket sales. It may be because there is a high degree of internet penetration. However, due to security issues, many consumers are still afraid to use the internet as an online shopping tool and many users still have questions regarding the reliability of internet purchases and payments. This research focuses on examining consumers' attitude towards the usability of internet purchases, considering their perceived ease of use, utility, and confidence in internet purchases. The result of this research shows that perceived ease of use positively affects consumers' attitude towards the usability of internet purchases (Renny et. al. 2013). According to Ha and Stoel's (2009) study, Technology Acceptance Model describes consumers' technology adoption activity in the form of online shopping. This study also shows that consumers' attitude towards mobile commerce is influenced by their expectations of usability, pleasure, and confidence (Ha 2009). The discovery that

consumers' expectations of confidence and happiness play a significant role in their acceptance of e-shopping backs up previous findings (Childers et. al. 2001; Kumar and Bruner 2005). Technology Acceptance Model research also supports the significance of online shopping efficiency perception in online shopping adoption (Ahn et. al. 2004). According to some surveys, consumers' attitude towards mobile commerce is positively affected by perceived ease of use (Lim & Ting, 2012; Yuliharsi et. al. 2011; Ha and Stoel 2009). Consumers' attitude towards technology use are directly influenced by perceived ease of use. When a user can access a program without difficulties, he or she may consider it to be simple to use. As a result, they will be more likely to use the applications daily. According to Sevim (2017)'s study, attitude towards mobile commerce was favorably influenced by the perceived ease of use of applications that offer online travel goods. Her study explored consumers' adoption of mobile commerce in the form of travel goods is influenced by several factors. The research used the Technology Acceptance Model which is tested in the form of travel goods. The study's findings indicate that consumers' attitude towards mobile commerce is influenced by their perceptions of ease of use (Sevim et. al. 2017).

A generalized attitude and its influences on the evaluation of modern technologies in related contexts have been exposed in previous observational research (Vijayasarathy 2004; Moon and Kim 2001). In this study, consumers' attitude towards mobile commerce is defined as the degree to which a consumer's decision towards the use of mobile commerce services whether they are beneficial or unfavorable.

Thus, it is hypothesized that;

H1: Perceived ease of use has a statistically significant effect on consumers' attitude towards mobile commerce.

2.6.2 The Relationship Between Perceived Ease of Use and Consumers' Intention to Use Mobile Commerce

The Technology Acceptance Model is used to describe a self-reported indicator of time or frequency of adopting the application, while a user's intention to use a technology is a

measure of the probability that one will adopt the technology (Davis et al. 1989). However, obtaining an empirical calculation of an individual's intention to communicate a specific action is neither simple nor realistic. A strong association between the desire to participate in a certain action and the real behavior has been shown in many experiments, both theoretically and empirically (Dabholkar and Bagozzi 2002; Lucas and Spittler 1999). In this study, consumers' intention to use mobile commerce is described as a person's desire to use mobile commerce services.

In the Technology Acceptance Model, relations between perceived ease of use and consumers' intention to use a technology have been empirically examined in the literature. A good amount of research has used various consumption tests and indicate that perceived ease of use has a strong correlation with consumers' intention to use a system (Adams 1992). Perceived ease of use refers to the degree to which consumers feel their ongoing use of e-government is effort-free in the sense of Chiu and Wang (2008)'s report. Users will be more likely to learn about a technology's functionality and eventually plan to continue using it if it is relatively simple to use. Perceived ease of use has been shown to be strongly correlated with the intention to continue studying on the internet in studies (Wang 2008). Cheng (2013) studied the roles of communication and flow in describing nurses' embrace of e-learning. Centered on the principles of Technology Acceptance Model, this research addressed three forms of relationship variables; learner-instructor relationship, learner-learner relationship, and learner-system relationship in order to analyze nurses' intentions to use e-learning programs. According to the study's findings, the effect of perceived ease of use on users' intention to use a technology was found to be important (Cheng 2013). According to Norazah's (2011) study, perceived ease of use is defined as the degree to which consumers consider 3G mobile networks to be simple or easy to use. He discovered a correlation between perceived ease of use and consumers' intention to use 3G mobile services (Norazah 2011). Rawashdeh (2015) studied the use of the 4G mobile services by the user is perceived as easy or effortless. He concluded that perceived ease of use of 4G networks would have a positive effect on users' intention to use the system (Rawashdeh 2015).

Thus, it is hypothesized that;

H2: Perceived ease of use has a statistically significant effect on consumers' intention to use mobile commerce.

2.6.3 The Relationship Between Perceived Usefulness and Consumers' Attitude Towards Mobile Commerce

The first fundamental relationship, as in previous Technology Acceptance Model research, is that perceived usefulness and perceived ease of use can influence consumers' attitude towards the technology. It is assumed that an individual's level of confidence impacted perceived usefulness (Eriksson et. al. 2005). The perceived usefulness of an information system was found to be the most important factor in deciding its use (Pikkarainen et al. 2004). The relationship between perceived usefulness and consumers' attitude towards a technology was found to be slightly better than the relationship between perceived ease of use and consumers' attitude towards the technology (Davis 1989).

Perception and levels of education have been shown to be significant influences in how people view emerging technologies as beneficial and how they practice using it (Lymperopoulos and Chaniotakis 2005). Since education level is a predictor of a prospective user's desire to understand, it can be positively correlated with their values. Employees are usually rewarded with successful results and bonuses in a performance-oriented e-business setting, they contend. This means that understanding the value would have a positive effect on how people feel about it (Lai and Yang 2009).

According to Renny's research, consumers' attitude towards online airline ticketing accessibility are positively influenced by perceived usefulness. This analysis is consistent with previous findings. When it comes to internet purchases, perceived usefulness has a strong influence on how people feel about shopping online (Renny et. al. 2013). Weng's research looked at the adoption of digital interactive teaching materials, evaluated the findings, came to conclusions, and made recommendations. To summarize the findings, the perceived usefulness had a major impact on consumers' attitude towards using digital teaching content and their decision to use it (Weng et. al. 2018). According to

Rawashdeh's study (2015), the degree to which a person assumes that using 4G networks can enhance their communicational efficiency is referred to as perceived usefulness. He concluded that perceived usefulness of 4G networks would have a positive effect on consumers' attitude towards using them (Rawashdeh 2015).

Thus, it is hypothesized that;

H3: Perceived usefulness has a statistically significant effect on consumers' attitude towards mobile commerce.

2.6.4 The Relationship Between Perceived Usefulness and Consumers' Intention to Use Mobile Commerce

Subramanian (1994) studied perceived usefulness and discovered that it had a direct impact on users' intention to use a technology (Subramanian 1994). Childers et al. (2001) claimed that perceived usefulness appears as the strongest indicator of consumers' attitude towards online shopping when compared with other variables' relationship with consumers' attitude towards online shopping. This backs up previous Technology Acceptance Model studies which found that users' primary determinant of technology usage is perceived usefulness (Childers et al. 2001; Davis 1989). According to Norazah's (2011) study, perceived usefulness is defined as the degree to which a person assumes that using 3G mobile networks can help him or her to connect more effectively. The results of his study showed that subscribers find that using 3G network networks is both easy and effective. He concluded that perceived usefulness has a positive influence on the decision to use 3G mobile networks. This result perceived usefulness is a significant determinant of users' actions and intentions (Norazah 2011). Because generation Y consumers are known for being early adopters of digital technologies and heavy internet users, mobile devices have become an important part of their everyday routine (Kim and Hahn 2015). As a result of it, financial service companies will be able to draw and retain generation Y consumers who use mobile commerce services. They can develop the programs they offer in line with generation Y's preferences in order to fulfill their demands and wishes (Moorthy et. al. 2014). Barnes (2002) states that "Mobile commerce is a monetary transaction implemented through wireless telecommunication network"

(Barnes 2002). Companies should understand the needs and desires of users in order to offer quality services in order to enable them to use mobile commerce. As a result, it would draw more new users while increasing their companies' revenues and profits (Pedersen et. al. 2002).

For recognizing and forecasting the determinants of mobile commerce acceptance, Chong (2013) used a two-staged SEM-neural network approach. His study showed that consumers' intentions to use mobile commerce were greatly affected by perceived usefulness (Chong 2013). Escobar and Monge (2012) wanted to consider the reasons that affect a student's ability to use Moodle in order to decide what steps could be taken to maximize its use to enhance their skills and grades. They discovered that perceived usefulness did offer great understanding into the purpose of using Moodle. As a result, this research hypothesizes that perceived usefulness of email usage influences university students' decision to use e-mail (Escobar and Monge 2012). According to Moorthy's (2014) research, it is concluded that the Technology Acceptance Model can forecast generation Y's intention to use mobile commerce services. His study also showed that, of the six independent variables, perceived usefulness is the most critical determinant of generation Y's intention to use mobile commerce services (Moorthy 2014).

Thus, it is hypothesized that;

H4: Perceived usefulness has a statistically significant effect on consumers' intention to use mobile commerce.

2.6.5 The Relationship Between Innovativeness and Consumers' Attitude Towards Mobile Commerce

It has long been recognized in general innovation studies that highly innovative people are active ones who seek for new ideas. They can deal with high levels of insecurity and build more optimistic acceptance intentions (Rogers 1983). A series of experiments in innovation, marketing, and psychology looked at the impact of personal characteristics on adoption behavior as an internal incentive in the late 1990s (Compeau et. al. 1999; Kanfer and Heggestad 1997). Demographics, product knowledge, and personal ideals,

social environment and social expectations of an organization as well as the perceived relative benefit of the invention, all affect users' innovativeness, or the propensity to adopt innovations (Woodside and Biemans 2005). A few studies have successfully incorporated personal characteristics into technology adoption analysis, and still fewer have successfully integrated personal features into intention to embrace IT/IS technologies (Lu et al. 2003). Gao (2012) defined the level of innovativeness as users who see themselves as early adopters of emerging smartphone applications, newly launched tablets, and other devices (Gao et al. 2012). In this study, innovativeness is described as the practical implementation of users' ideas that result in the adoption of mobile commerce services. Some research has looked at the digital divide from a cognitive perspective, such as how an innovative technology affects its usage intent and others have looked at the impact of creativity (Rogers 1983) on bridging the digital divide. Agarwal and Prasad (1998) concluded that users improve their beliefs about technology by synthesizing content from a variety of sources, based on Rogers' Theory of Innovation Diffusion. Users with higher personal innovativeness are predicted to develop more optimistic views about the target technology when exposed to the same forms of coverage (Agarwal and Prasad 1998). Personal innovativeness is described as "The risk-taking tendency that occurs in some users but not in others" by Agarwal and Prasad (1998). They added this user difference component as a new concept to Davis's (1989) original Technology Acceptance Model, hypothesizing that people with higher levels of innovativeness are more likely to create favorable attitudes about the innovation in terms of perceived ease of use, perceived usefulness and more positive attitudes towards using a new technology (Agarwal and Prasad 1998).

A multidimensional structure is an antecedent of the most generally held cultural assumptions about technology use: perceived usefulness, perceived ease of use, users' attitude towards the new technology and users' intention to use the new technology. They concluded that innovativeness is an essential determinant of users' attitude towards the new technology (Agarwal and Karahanna 2000).

According to Mahat et al.'s studies (2012) it has been used to figure out how people feel about online shopping, mobile learning, cellular service adoption, and web

advertisements etc. (Mahat et al. 2012). Innovativeness has been found in several surveys to have a significant impact on consumers' attitude towards product innovation (Rogers 2003). In other fields, such as mobile learning, Mahat et al. (2012) presented data that shows that students' mobile learning intentions are influenced by their personal innovativeness (Mahat et al. 2012). Karahanna et al. (1999) claimed that many creative consumers feel emerging innovations are less complex and therefore are willing to be early adopters (Karahanna et al. 1999). Based on these assumptions, it can be hypothesized that innovativeness can minimize the negative impact of frustration on consumers' attitudes towards mobile transactions and has a positive effect on consumers' attitudes towards mobile commerce.

Thus, it is hypothesized that;

H5: Innovativeness has a statistically significant effect on consumers' attitude towards mobile commerce.

2.6.6 The Relationship Between Innovativeness and Consumers' Intention to Use Mobile Commerce

According to Wood and Swait (2002) consumer innovativeness has been used to research how emerging technologies and services are adopted (Wood and Swait 2002). Hirschman claimed that innovativeness is often defined as a personality trait that can be used to forecast consumers' intention to use a wide range of technical advances (Hirschman 1980). Citrin et al. (2000) claimed that consumers' intention to use online shopping tools can be predicted by innovativeness (Citrin et al. 2000). In addition, recent research on consumers' intention to use the wireless application protocol (WAP) show that innovativeness can forecast mobile commerce adoption (Hung et al. 2003).

Kim et al. (2010) claimed that the variables that shape mobile commerce have found that the human psychological construct of personal innovativeness is a valuable indicator of users' behavioral intention to embrace mobile commerce (Kim et al 2010). According to Kuo and Yen's study (2009), there is a favorable relationship between innovativeness and consumers' intention to use a new technology, meaning that users with higher

innovativeness are more likely to use the new technology (Kuo and Yen 2009). Truong (2013) stated that the concept of innovation is well-known, well-established, and widely adopted to the point that all consumers around the world are assumed to be alike in their ability to consider new technologies (Truong 2013).

Thus, it is hypothesized that;

H6: Innovativeness has a statistically significant effect on consumers' intention to use mobile commerce.

2.6.7 The Relationship Between Perceived Risk and Consumers' Attitude Towards Mobile Commerce

According to Cho (2004), consumers' attitude towards mobile commerce are influenced by their perceptions of risk (Cho 2004). Chen (2008) used Technology Acceptance Model and Diffusion of Innovations (DOI) to look at the variables that influence mobile payment acceptance and discovered that users' perceptions of risk have a huge impact on their attitude towards mobile payment services (Chen 2008). Chitunga and Munongo (2013) conducted a survey of 275 Zimbabweans who agreed that perceived risk plays a significant role in the adoption of mobile payment services (Chitunga and Munongo 2013).

Luo et al. (2010) stated the same conclusion when they researched the factors influencing mobile commerce adoption in the United States. Their study of 122 available responses from undergraduate students in the United States found that perceived risk would explain 22 percent of the variation in their attitude towards mobile commerce. According to Mohamed and Terry's study (2017), perceived risk was statistically the most important factor in deciding whether to plan to use mobile commerce or not in Bangladesh. They claimed that there may be some explanations for why perceived risk was discovered to be the most important variable. Since mobile commerce is a very new technology in Bangladesh, users are unaware of the technology's potential. On the other hand, it is possible that confidence has not yet grown to the point where people can use this technology without feeling at risk while using them (Mohamed and Terry 2017).

Thus, it is hypothesized that;

H7: Perceived risk has statistically significant effects on consumers' attitude towards mobile commerce.

2.6.8 The Relationship Between Perceived Risk and Consumers' Intention to Use Mobile Commerce

It has been suggested that risk perception is multidimensional. Many studies have categorized risk in different ways, but they all accept that there are physical and psychological risks that the user faces when engaging in activities, and that these risks can be triggered by several factors such as individual incidents, environmental conditions, and social interaction (Sohn et. al. 2016). According to Moutinho (1987), there are five factors of risk: social, functional, physical, economical, and psychological (Moutinho 1987). These factors are extended to seven (social, equipment, physical, economical, time, happiness, and psychological) by Roehl and Fesenmaier (1992). According to Tan and Teo (1998), perceived risk is thought to have a negative impact on the adoption of online transactions (Tan and Teo 1998). Maditinos et al. (2013) noticed that two distinct aspects of perceived risk had detrimental and important impacts on user acceptance of online transactions such as performance risk and protection risk (Maditinos et. al. 2013). Barros and Botelho (2012) studied the association between perceived risk and the adoption of a new technology or system and discovered that the higher the perceived risk in activities, the lower the tendency for using the new technology or system (Barros and Botelho 2012). As a result, higher levels of perceived risk mean a lower likelihood of using this technology. Marafon et. al. (2018) believed that the users' perceived risk would adversely affect their intention to use online banking, based on the detrimental effect of perceived risk on the decision to participate in such activities or implement emerging technology. They considered acknowledgement of risk and consumer self-confidence are believed to be drivers of the effect of perceived risk and desire to use online banking. They concluded that users' self-confidence influences the association between perceived risk and their intention to use online banking and users who have higher levels of self-confidence also have a lower impact of perceived risk on intention to use than for those with lower levels of self-confidence. As a result, users with higher levels of self-

confidence are less vulnerable to the detrimental effects of perceived risk on their decision (Marafon et. al. 2018).

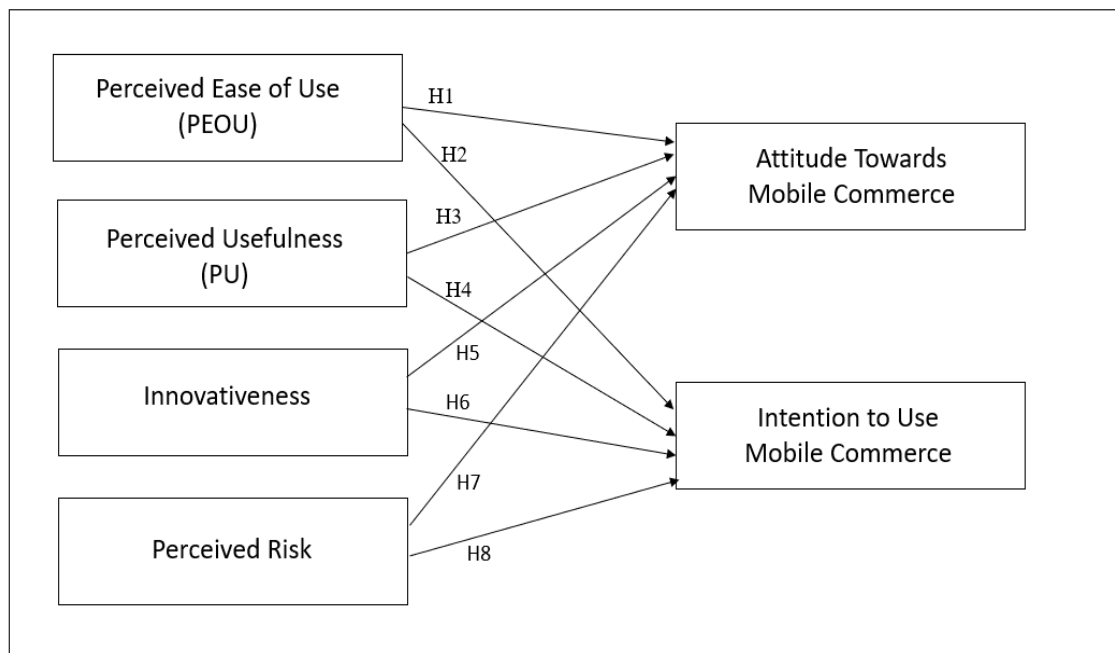
In this study, it is believed that the users' perceived risk would adversely affect their intention to use mobile commerce services, based on the detrimental effect of perceived risk on the decision to adopt them.

Thus, it is hypothesized that;

H8: Perceived risk has statistically significant effects on consumers' intention to use mobile commerce.

The research model used in this study is shown in Figure 2.8. Conceptual Research Model. The model has four independent variables and two dependable variables.

Figure 2.8: Conceptual Research Model



3. RESEARCH METHODOLOGY

The focus and purpose of this research are discussed in this section. Aside from that, the analysis process is explained, as well as the research limitations, the sampling technique, and the data collection methods.

3.1 RESEARCH OBJECTIVES

The acceptance of mobile commerce applications is a critical marketing reality for the sector since it has a significant impact on consumers' attitude towards mobile commerce and their intention to use mobile commerce applications. The aim of this research is to apply the Technology Acceptance Model to mobile commerce setting and to explore the effects perceived usefulness and of perceived ease of use on consumers' intentions to use mobile commerce and their attitudes towards mobile commerce. Besides, in parallel with literature, consumer innovativeness and perceived risk are also added in the research model as independent variables and their effects on consumers' attitudes towards mobile commerce and their intentions to use mobile commerce are also investigated. Moreover, this research also aims to contribute to present literature in mobile commerce by investigating consumers' acceptance factors in Turkey. The research investigates the variables that influence acceptance of mobile commerce and identifies the most important ones to help marketers meet their target audiences. Each variable's degree of effectiveness is described and tested in addition to its effect.

3.2 RESEARCH LIMITATIONS

The popular mobile commerce applications were chosen as stimuli by a pre-test applied to randomly selected participants. According to the literature, there has been no official data available that showed the most popular mobile commerce application in Turkey. The pre-test was applied for the consumers who live in Turkey and use at least one mobile commerce application. As a result, it can represent the most popular mobile commerce application among Turkish consumers only. According to the pre-test responses of participants who conducted the survey, the most used application, Trendyol was studied

as the research's subject. The study's sampling approach is convenience sampling, and its key limitation is that only Trendyol was studied.

3.3 RESEARCH DESIGN

The research is a descriptive research. In the first phase of the study, literature review of acceptance of mobile commerce was conducted. The variables that influence consumers' acceptance of mobile commerce were identified as a consequence of the review of literature. After the literature review, a pre-test was conducted for the purpose of selecting the most used application for participants. As a result of the pre-test, it was decided to study Trendyol as a research subject.

The questionnaire was created based on the findings of the exploratory phase. Following that, the questionnaire was shared with participants and the data was collected. Finally, the collected data was analyzed. These analyses are covered in the following sections.

3.3.1 Pre-Test of The Research

The pre-test was performed after the literature review to determine the subject of research. An open-ended online questionnaire (Appendix 1) was administered to 53 participants on 12 February 2020 as part of the pre-test analysis. Participants chose the mobile commerce application that they use the most. As a result of most of the participants being written, Trendyol was chosen by 28 participants and it is defined as the research's subject.

3.3.2 Research Variables

This research's independent variables are perceived ease of use (Wua and Wang 2005; Davis 1989), perceived usefulness (Yang 2005; Davis 1989), perceived risk (Wua and Wang 2005), and innovativeness (Goldsmith 2002). Moreover, this research's dependent variables are consumers' attitude towards mobile commerce (Kwon et. al. 2014) and consumers' intention to use mobile commerce (Kwon et. al. 2014).

3.3.3 The Scales, The Questionnaire, Data Collection Method and The Sampling Process

Appendix 3 lists all of the scale items as well as their sources. Each construct in the study was measured from strongly disagree (1) to strongly agree (5) by using five Likert type scales.

As it is seen in Appendix 2, at the beginning of the questionnaire there is a filter question where participants must select whether they use the Trendyol mobile commerce application or not. After the filter question, they begin the questionnaire which is divided into two parts, demographic and methodological questions.

The first part contained 25 questions which include perceived ease of use, perceived usefulness, perceived risk, innovativeness, consumers' intention to use mobile commerce and their attitude towards mobile commerce. Each question was marked by the respondents using five Likert type scales (1 strongly disagree; 2 disagree; 3 neither agree nor disagree; 4 agree and 5 strongly agree).

In the second part, demographic questions were answered by using the choices that had been prepared based on previous studies in Turkey. There were seven questions and they are assumed to be important to present demographic characteristics of participants. Two of them were open-ended questions which target the most used mobile commerce application and the most frequently purchased product category in mobile commerce. While the other five questions were closed-ended questions regarding gender, age, education, income level and occupation.

At the beginning of the questionnaire preparation process, the relevant scales were subjected to a back translation procedure. After the author translated all the items from English to Turkish, a language expert in English completed the back translation process. The final questionnaire was applied in Turkish with the intention of having participants to complete it in their own language. The questionnaire was published on the google forms website on 7 June 2020 that could be accessed from a computer with an internet

connection. Therefore, in parallel with the context of the research question, a convenience sampling approach and an online survey approach were utilized.

The results of the collected surveys were checked, and the editing process began. A total of 310 participants completed the survey between 7 June 2020 and 14 June 2020, and they were included in the sampling process. Since 60 of the participants did not use the Trendyol mobile application, they marked the filter question as “no” and left the survey. As a result of the filtering process, 250 participants out of 310 were using Trendyol mobile application. Thus, 250 participants were included in the study. Following the filtering process, the questionnaires were coded in SPSS software for further statistical analysis.

4. RESEARCH FINDINGS

In this section, the following are studied: sampling profile, mobile commerce usage habits of participants, reliability analysis of scales, descriptive statistics for research variables, Exploratory Factor Analysis results, and the results of Multiple Regression Analysis.

4.1 DEMOGRAPHIC PROFILE OF THE PARTICIPANTS

The frequency distribution of the demographic profile of the participants is explained in this section. Looking at the demographic characteristics of the survey participants (Table 4.1), it is seen that 74 percent of the participants were women. It is also observed that most of the participants are between the ages of 25-34 (57.20 percent) and 21.60 percent of the participants are 35-49 years old. Most of the participants (55.20 percent) are at the graduate level, 13.20 percent are at the master's or doctoral level, 8.80 percent are at the undergraduate level, 19.60 percent are at the high school level, and 3.20 percent are at the primary school level. When the income distribution is examined, it is seen that many of the participants have an income 2501-4000 TL (28.8 percent), 4001-6000 TL (27.60 percent) and 6001 TL and above (28.8 percent), since most of the participants are employed by private sector.

Table 4.1: Demographic Profile of Participants

	Total Sample N=250	
	Frequency	Valid Percent (%)
Gender		
Male	65	26.00
Female	185	74.00
Age		
18-24	35	14.00
25-34	143	57.20
35-49	54	21.60
50 and above	18	7.20
Education		
Primary School	8	3.20
High School	49	19.60

Undergraduate	22	8.80
Graduate	138	55.20
Postgraduate	33	13.20
Income Level		
1500 TL and below	23	9.20
1501 - 2500 TL	14	5.60
2501 - 4000 TL	72	28.80
4001 - 6000 TL	69	27.60
6001 TL and above	72	28.80
Occupation		
Private Sector	150	60.00
Student	23	9.20
Government Official	22	8.80
Retired	10	4.00
Self-employment	8	3.20
Other	16	6.40
Unemployed	21	8.40

4.2 MOBILE COMMERCE USAGE HABITS OF PARTICIPANTS

In this section mobile commerce applications' usage frequency and categories' usage frequency for participants are observed. Mobile commerce applications' usage frequency for participants is shown in Table 4.2. It is seen that more than half of the participants chose Trendyol as the most preferred mobile commerce application (60.8 percent). Participants who chose Hepsiburada as the most used mobile commerce application are 14.8 percent. Getir (3.2 percent), n11 (3.2 percent), Morhipo (2.8 percent) and Amazon (2 percent) were chosen almost as often by participants. Participants who chose other mobile commerce applications as the most used are 13.2 percent of the survey. These applications are Yemeksepeti, Gittigidiyor, Letgo, Çiçeksepeti, Migros, etc.

Table 4.2: Most Frequently Used Mobile Commerce Applications

	Total Sample N=250	
	Frequency	Valid Percent (%)
Trendyol	152	60.8
Hepsiburada	37	14.8
Getir	8	3.2
n11	8	3.2

Morhipo	7	2.8
Amazon	5	2
Other	33	13.2

Categories' usage frequency for participants is shown in Table 4.3. It is seen that more than half of the participants use mobile commerce the most for the fashion category (52 percent). Participants who use mobile commerce the most for the home category is 16 percent, for the electronic category is 14 percent. Only 6.8 percent of participants use mobile commerce the most for the cosmetics category. Moreover, 5.6 percent of the participants use mobile commerce the most for the food category. Participants who use mobile commerce the most for other categories are 5.6 percent.

Table 4.3: Most Frequently Purchased Product Categories

	Total Sample N=250	
	Frequency	Valid Percent (%)
Electronic	35	14
Home	40	16
Food	14	5.6
Fashion	130	52
Cosmetics	17	6.8
Other	14	5.6

4.3 RELIABILITY ANALYSIS OF SCALES

The results of the scales' reliability scores are covered in this section of the study. The reliability levels of the scales used in the study were calculated with alpha coefficient (Cronbach's alpha). Alpha coefficient is a consistency measure and explains consistency as a group (Cortina 1993). The lowest reliability figure that can be accepted in social science standards is 0.70 (Nunnally 1978). The level of reliability indicates that a scale is answered consistently by the participants and not randomly answered. For this reason, the data are tested at 70 percent confidence interval and as a result, the respondents are expected to give consistent answers above 0.70.

In this study, which was conducted to measure the factors affecting consumers' technology acceptance of Trendyol mobile application, it was seen that the Cronbach coefficient was 77.6 percent for the perceived usefulness, 83.8 percent for the perceived ease of use, 89.6 percent for the consumers' attitude towards mobile commerce, 85.8 percent for consumers' intention to use mobile commerce, 93.4 percent for perceived risk and 86.9 percent for the innovativeness (Table 4.4).

Table 4.4: Reliability scores of scales

Scales	Cronbach's Alpha	N of Items
Perceived Usefulness	0.776	5
Perceived Ease of Use	0.838	4
Consumers' Attitude Towards Mobile Commerce	0.896	3
Consumers' Intention to Use Mobile Commerce	0.858	3
Perceived Risk	0.934	4
Innovativeness	0.869	6

4.4 DESCRIPTIVE STATISTICS FOR RESEARCH VARIABLES

As previously stated, there are 4 independent variables in the questionnaire that discover the variables that influence consumers' acceptance of Trendyol mobile commerce application. The Five-Likert scale was used to answer 25 questions on the questionnaire. The following parts include the mean scores and standard deviation scores for each scale regarding the whole sample (Table 4.5).

According to the descriptive statistics, *I think learning to use Trendyol mobile application is easy* (perceived ease of use) has the highest mean score (4.27). On the other hand, *I will consider buying something over the mobile, even if I have not heard it before* (innovativeness) has the lowest mean score which is 2.83 over 5.

Table 4.5: Descriptive Statistics for Scales Used in the Study

	Total	
	Mean	Std. Deviation
Perceived Usefulness		
Trendyol mobile application contributes to the betterment of life	3.86	0.78
It is fashionable and trendy to use Trendyol mobile application	4.22	0.77
Trendyol mobile application would lead to an invasion of personal privacy	3.40	1.02
It is safe to make purchase using Trendyol mobile application	3.78	0.94
The development of Trendyol mobile application is a waste of resources	3.63	0.94
Perceived Ease of Use		
I think learning to use Trendyol mobile application is easy.	4.27	0.63
I think finding what I want via Trendyol mobile application is easy.	3.99	0.82
I think becoming skillful at using Trendyol mobile application is easy.	4.11	0.72
I think using Trendyol mobile application is easy.	4.20	0.62
Consumers' Attitude Towards Mobile Commerce		
Using Trendyol mobile application is a good idea.	3.94	0.84
I have positive feelings toward Trendyol mobile application in general.	3.88	0.74
It is a wise idea to use Trendyol mobile application.	3.83	0.76
Consumers' Intention to Use Mobile Commerce		
I recommend others to use Trendyol mobile application.	3.81	0.84
I am likely to continually use Trendyol mobile application in my life.	4.04	0.69
I intend to use Trendyol mobile application as much as possible.	3.55	0.91
Perceived Risk		
I think using Trendyol mobile application in monetary transactions has potential risk.	3.17	1.01
I think using Trendyol mobile application in product purchases has potential risk.	3.15	1.01
I think using Trendyol mobile application in merchandise services has potential risk.	3.20	1.04
I think using Trendyol mobile application puts my privacy at risk.	3.17	1.01
Innovativeness		
In general, I am the last in my circle of friends to know the names of the latest places to shop on the mobile.	2.99	1.00
I know more about shopping over the mobile than other people.	3.18	1.00
In general, I am among the last in my circle of friends to purchase something over the mobile.	3.07	1.09
Compared to my friends, I do little shopping over the mobile.	3.15	1.14
If I heard that a new product that I was interested in was available over the mobile, I would be interested enough to buy it.	3.71	0.91
I will consider buying something over the mobile, even if I haven't heard of it before.	2.83	1.20

The overall mean scores of the scales are given in Table 4.6. Accordingly, among the scales, it is seen that the perceived ease of use has the highest mean score (4.14) and the innovativeness has the lowest (3.15).

Table 4.6: Overall Mean Scores and Standard Deviations of Scales Used in the Study

	Total	
	Mean	Std. Deviation
Perceived Usefulness	3.7784	0.6502
Perceived Ease of Use	4.1440	0.5754
Consumers' Attitude Towards Mobile Commerce	3.8853	0.7096
Consumers' Intention to Use Mobile Commerce	3.7987	0.7213
Perceived Risk	3.1710	0.9290
Innovativeness	3.1547	0.8258

4.5 EXPLORATORY FACTOR ANALYSIS

There are a total of six scales associated with the study's independent and dependent variables. The exploratory factor analysis method was used to understand whether the factors exhibit the same dimensional structure as they do in the literature. For this purpose, all six scales were subjected to Exploratory Factor Analysis and they were analyzed in terms of their dimensional structures. The Kaiser–Mayer–Olkin (KMO) sampling adequacy and Bartlett’s test findings are presented as a result of the Factor Analysis.

In Table 4.7, KMO and Bartlett’s test results are examined for perceived usefulness. It is seen that Kaiser–Mayer–Olkin measure of sampling adequacies is close to 1 and the significance level of the variables is less than 0.05, indicating that a factor analysis is appropriate for the data.

Table 4.7: KMO and Bartlett's Test for Perceived Usefulness

KMO and Bartlett's Test		Perceived Usefulness
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.742
Bartlett's Test of Sphericity	Approx. Chi-Square	355.435
	df	10
	Sig.	0.000

In Table 4.8, KMO and Bartlett's test results are examined for perceived ease of use. It is seen that Kaiser–Mayer–Olkin measure of sampling adequacies is close to 1 and the significance level of the variables is less than 0.05, indicating that a factor analysis is appropriate for the data.

Table 4.8: KMO and Bartlett's Test for Perceived Ease of Use

KMO and Bartlett's Test		Perceived Ease of Use
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.803
Bartlett's Test of Sphericity	Approx. Chi-Square	451.533
	df	6
	Sig.	0.000

In Table 4.9, KMO and Bartlett's test results are examined for perceived risk. It is seen that Kaiser–Mayer–Olkin measure of sampling adequacies is close to 1 and the significance level of the variables is less than 0.05, indicating that a factor analysis is appropriate for the data.

Table 4.9: KMO and Bartlett's Test for Perceived Risk

KMO and Bartlett's Test		Perceived Risk
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.830
Bartlett's Test of Sphericity	Approx. Chi-Square	1001.345
	df	6
	Sig.	0.000

In Table 4.10, KMO and Bartlett's test results are examined for innovativeness. It is seen that Kaiser-Mayer-Olkin measure of sampling adequacies is close to 1 and the significance level of the variables is less than 0.05, indicating that a factor analysis is appropriate for the data.

Table 4.10: KMO and Bartlett's Test for Innovativeness

KMO and Bartlett's Test		Innovativeness
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.848
Bartlett's Test of Sphericity	Approx. Chi-Square	772.623
	df	15
	Sig.	0.000

In Table 4.11, KMO and Bartlett's test results are examined for consumers' attitude towards mobile commerce. It is seen that Kaiser-Mayer-Olkin measure of sampling adequacies is close to 1 and the significance level of the variables is less than 0.05, indicating that a factor analysis is appropriate for the data.

Table 4.11: KMO and Bartlett's Test for Consumers' Attitude Towards Mobile Commerce

KMO and Bartlett's Test		Consumers' Attitude Towards Mobile Commerce
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.733
Bartlett's Test of Sphericity	Approx. Chi-Square	479.829
	df	3
	Sig.	0.000

In Table 4.12, KMO and Bartlett's test results are examined for consumers' intention to use mobile commerce. It is seen that Kaiser–Mayer–Olkin measure of sampling adequacies is close to 1 and the significance level of the variables is less than 0.05, indicating that a factor analysis is appropriate for the data.

Table 4.12: KMO and Bartlett's Test for Consumers' Intention to Use Mobile Commerce

KMO and Bartlett's Test		Consumers' Intention to Use Mobile Commerce
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.730
Bartlett's Test of Sphericity	Approx. Chi-Square	366.485
	df	3
	Sig.	0.000

Since the values are examined in line with the findings of KMO and Bartlett's test, the sample is adequate for factor analysis and there is a sufficient level of relationship between the variables. It has been observed that all variables preserve their original structure and they are unidimensional.

The % of variance column gives the ratio of the variance accounted for by each scale to the total variance in all of the variables. Scales' % of variance values are shown in Table 4.13. It is observed that perceived usefulness has the highest ratio (55.506 percent).

Table 4.13: Total Variance Explained

Scales	% of Total Variance
Perceived Usefulness	55.506
Perceived Ease of Use	17.264
Consumers' Attitude Towards Mobile Commerce	12.260
Consumers' Intention to Use Mobile Commerce	8.118
Perceived Risk	3.832
Innovativeness	3.020

4.6 REGRESSION ANALYSIS

The entire sample was subjected to multiple regression analysis to see independent variables' impacts on dependent variables. The research's independent variables are perceived ease of use, perceived usefulness, perceived risk, and innovativeness. Moreover, the dependent variables are consumers' intention to use mobile commerce and their attitude towards mobile commerce.

The value of the multiple correlation coefficient between independent variables and the dependent variable is seen in the R column (Field 2009). The dependent variable in Table 4.14 is consumers' attitude towards mobile commerce. As predictors, independent variables are used, with a value of 0.773. If the R value is close to 1, the regression equation is more efficient. R Square is 0.598, which explains 59.8 percent of the variance in acceptance of Trendyol mobile application. As a result, the R and R Squared values indicate that the regression equation's result is very satisfying. The next part of the outputs shows the analysis of variance (ANOVA).

Table 4.14: Regression Analysis: Model Summary for Consumers' Attitude Towards Mobile Commerce

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.773 ^a	0.598	0.591	0.45361
a. Predictors: Perceived usefulness, Perceived ease of use, Perceived risk, Innovativeness				
b. Dependent Variable: Consumers' attitude towards mobile commerce				

The F ratio is the most important part of the table. As it is seen in Table 4.15 for the dependent variable (consumers' attitude towards mobile commerce) F is 91.084, which is significant at $p < 0.001$. Once the regression equation has been determined to be important, the next step is to determine which factors influence consumers' attitude towards mobile commerce.

Table 4.15: ANOVA for Consumers' Attitude Towards Mobile Commerce

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	74.967	4	18.742	91.084	0.000 ^b
	Residual	50.412	245	0.206		
	Total	125.380	249			
a. Dependent Variable: Consumers' attitude towards mobile commerce						
b. Predictors: Perceived usefulness, Perceived ease of use, Perceived risk, Innovativeness						

Coefficients of the independent variables are listed in Table 4.16. All factors have a significant effect on the acceptance of Trendyol mobile commerce application. It is seen that p values of perceived usefulness and innovativeness are less than 0.05 which indicates that H3 and H5 are accepted. Moreover, p values of perceived ease of use and perceived risk are greater than 0.05. Therefore, H1 and H7 are rejected.

Perceived usefulness is the most influential factor at 0.669, followed by innovativeness. Moreover, when collinearity statistics are examined, it is seen that VIF values of independent variables lie between 1 and 10. Therefore, it can be concluded that there are no multicollinearity symptoms.

Table 4.16: Coefficients of Independent Variables for Consumers' Attitude Towards Mobile Commerce

Coefficients ^a			
Total Sample	Standardized Coefficients Beta (β)	P value	VIF
(Constant)	0.362	0.138	
Perceived Usefulness	0.669	0.000	1.712
Perceived Ease of Use	0.071	0.192	1.800
Perceived Risk	0.015	0.727	1.107
Innovativeness	0.135	0.004	1.290
a. Dependent Variable: Consumers' attitude towards mobile commerce * significant at 0.05 R square=0.598 Adjusted R Square = 0.591 VIF < 2.487			

The dependent variable in Table 4.17 is consumers' intention to use mobile commerce. As predictors, independent variables are used, with a value of 0.775. R Square is 0.601, which explains 60.1 percent of the variance in acceptance of Trendyol mobile application. As a result, the R and R Squared values indicate that the regression equation's result is very satisfying.

Table 4.17: Regression Analysis: Model Summary for Consumers' Intention to Use Mobile Commerce

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.775 ^a	0.601	0.595	0.45912
a. Predictors: Perceived usefulness, Perceived ease of use, Perceived risk, Innovativeness b. Dependent Variable: Consumers' intention to use mobile commerce				

The F ratio is the most important part of the table. As it is seen in Table 4.18 for the dependent variable (consumers' intention to use mobile commerce) F is 92.375, which is significant at $p < 0.001$.

Table 4.18: ANOVA for Consumers' Intention to Use Mobile Commerce

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	77.889	4	19.472	92.375	0.000 ^b
	Residual	51.644	245	0.211		
	Total	129.533	249			
a. Dependent Variable: Consumers' intention to use mobile commerce						
b. Predictors: Perceived usefulness, Perceived ease of use, Perceived risk, Innovativeness						

Coefficients of the independent variables are listed in Table 4.19. All factors have a significant effect on the acceptance of Trendyol mobile commerce application. It is seen that p values of perceived usefulness and innovativeness are less than 0.05 which indicates that H4 and H6 are accepted. Moreover, p values of perceived ease of use and perceived risk are greater than 0.05. Therefore, H2 and H8 are rejected.

Two factors have a significant effect on acceptance of Trendyol mobile commerce application. Perceived usefulness is the most influential factor at 0.658, followed by innovativeness. Moreover, when collinearity statistics are examined, it is seen that VIF values of independent variables lie between 1 and 10. Therefore, it can be concluded that there are no multicollinearity symptoms.

Table 4.19: Coefficients of Independent Variables for Consumers' Intention to Use Mobile Commerce

Coefficients ^a			
Total Sample	Standardized Coefficients Beta (β)	P value	VIF
(Constant)	0.435	0.079	
Perceived Usefulness	0.658	0.000	1.712
Perceived Ease of Use	0.047	0.389	1.800
Perceived Risk	-0.039	0.357	1.107
Innovativeness	0.167	0.000	1.290
a. Dependent Variable: Consumers' intention to use mobile commerce			
* significant at 0.05			
R square=0.601			
Adjusted R Square = 0.595			
VIF < 2.506			

4.7 EVALUATION OF RESEARCH FINDINGS

The research findings of the study are evaluated in this section. Scales used in the study are perceived ease of use, perceived usefulness, perceived risk, innovativeness, consumers' intention to use mobile commerce and their attitude towards mobile commerce.

The dependent variables in the conceptual model used in the study are consumers' intention to use mobile commerce and their attitude towards mobile commerce. The independent variables are perceived ease of use, perceived usefulness, perceived risk and innovativeness.

A series of regression tests using the SPSS 25.0 package software was used to test the construct measures. The scales indicators' reliability scores are ranged from 0.776 to 0.934 which are appropriately high and they are higher than the 0.60 cut-off value that is suggested (Bagozzi et al. 1989). The crucial indicator is the level of statistically significant components (Cohen 1994). In the overall study, it is discovered that four hypotheses out of eight received significant support: H3, H4, H5 and H6. For the first dependent variable (consumers' attitude towards mobile commerce) that is examined, perceived usefulness and innovativeness have statistically significant effect on consumers' attitude towards mobile commerce since their p values are less than 0.05. Moreover, perceived usefulness is the most influential factor ($\beta=0.669$). For the second dependent variable (consumers' intention to use mobile commerce) that is examined, perceived usefulness and innovativeness have statistically significant effect on consumers' attitude towards mobile commerce since their p values are less than 0.05. In addition, perceived usefulness is the most influential factor ($\beta=0.658$). Therefore, this shows that perceived usefulness and innovativeness affects consumers' attitude towards Trendyol mobile commerce application and their intention to use the application.

An empirical research on mobile commerce acceptance in Bangladesh uses a similar model (Mohamed and Terry 2017). The model includes five independent variables, four of them have a major impact on consumers' intention to use mobile commerce. It is

observed that the most influential factor is perceived usefulness ($\beta=0.251$) (Mohamed and Terry 2017).

Another study conducted by Sevim et al. (2017) to investigate mobile commerce acceptance in online travel products. The model includes five independent variables, all of them have a significant effect on consumers' intention to use mobile commerce. They concluded that perceived usefulness has a statistically significant effect on consumers' intention to use mobile commerce ($\beta=0.410$) (Sevim et al. 2017).

An empirical research is conducted by Norazah (2011) on mobile commerce acceptance and he used a similar model where all hypotheses are supported. The model includes three independent variables, all of them have a major impact on consumers' attitude towards mobile commerce. It is observed that the most influential factor is perceived usefulness ($\beta=0.340$) (Norazah 2011).

Another study conducted by Gao et al. (2012) to investigate mobile commerce acceptance in China. The model includes six independent variables, all of them have a significant effect on consumers' attitude towards mobile commerce. They concluded that perceived usefulness has a statistically significant effect on consumers' attitude towards mobile commerce ($\beta=0.500$) and innovativeness has a statistically significant effect on consumers' attitude towards mobile commerce ($\beta=0.380$) (Gao et al. 2012).

Ha (2009) studied the factors that influence consumer acceptance of online shopping. He proposed that trust, enjoyment and perceived usefulness are the critical beliefs about consumer acceptance of online shopping. At the end of the study, he observed that perceived usefulness has a positive impact on consumers' attitude towards online shopping ($\beta=0.550$) (Ha 2009).

Another study is conducted by Chi (2018) to determine the key factors that influence the Chinese consumers' mobile commerce adoption. He concluded that perceived usefulness has a positively significant influence on Chinese consumers' attitude towards mobile commerce ($\beta=0.573$) (Chi 2018).

Lin (2005) studied the application of Technology Acceptance Model to mobile banking. He proposed that an expanded version of the Technology Acceptance Model be used to better understand how mobile banking technologies are accepted by consumers. At the end of his study, he observed that perceived usefulness has a positively significant influence on consumers' intention to use mobile banking systems ($\beta=0.310$) (Lin 2005).

An empirical research is conducted by Lu et al. (2005) on acceptance of a specific information system. They investigated the relationships among perceived usefulness, perceived ease of use, innovativeness and consumers' intention to use the information system. They concluded that the most influential factor is perceived usefulness which has a direct positive impact on consumers' intention to adopt the information system ($\beta=0.821$) (Lu et al. 2005).

Agarwal and Prasad (1998) stated a conceptual and operational definition of consumers' acceptance of a new information system. They concluded that innovativeness has a positively significant influence on consumers' intention to use a new information system ($\beta=0.470$) (Agarwal and Prasad 1998).

Weng et al. (2018) studied the acceptance of multimedia teaching materials. They proposed that there is a strong relationship among perceived usefulness, consumers' attitude towards multimedia teaching materials and consumers' intention to use multimedia teaching materials. At the end of their study, it is concluded that perceived usefulness has a positive impact on consumers' attitude towards multimedia teaching materials ($\beta=0.189$) and consumers' intention to use multimedia teaching materials ($\beta=0.456$) (Weng et al. 2018).

In this research, the effects of consumers' mobile commerce acceptance in Turkey are studied. There were eight proposed hypotheses about the significant effects of four independent variables (perceived ease of use, perceived usefulness, perceived risk and innovativeness) on each of the dependent variables (consumers' intention to use mobile commerce and their attitude towards mobile commerce). Consequently, it is shown that four of the hypotheses are supported as a result of the study.

4.7.1 Managerial Implications

Mobile commerce has evolved as a fresh and inevitable future trend. The development of mobile channels, such as Apple and Google's recent attempts to dominate the mobile smartphone market, have opened up new possibilities for companies to reach consumers. Companies must understand the different factors and challenges in order to improve consumers' acceptance of mobile commerce services.

The findings of this research have some consequences for mobile commerce companies who want to encourage consumers to accept mobile commerce services. Instead of relying only on technological advancements topics, companies should pay more attention to factors from the perspective of consumers. To gain a strategic edge, high technology would not be the only hidden weapon. Companies must carefully analyze variables such as perceived ease of use, perceived usefulness, perceived risk and innovativeness that contribute more to consumers' intention to use mobile commerce and their attitude towards mobile commerce in order to ensure acceptance of mobile commerce. Companies should consider making further enhancements to their mobile commerce applications to create a more useful and innovative consumer experience. Moreover, benefiting from Roger's (1983) research about Diffusion of Innovation, five adopter categories can be also used by companies. To conclude, both perceived usefulness and innovativeness significantly influence consumers' attitude towards mobile commerce and consumers' intention to use mobile commerce. As a result, developing systems to monitor these variables could help businesses prevent losing consumers in the competitive mobile market that grows really fast.

4.7.2 Implications for Future Research

This study could be useful for structural design of future studies about consumers' acceptance of mobile commerce. First of all, the results of the study were collected from participants living in Turkey. Therefore, cultural factors can also affect the acceptance of mobile commerce services between countries. Thus, future studies may use the national cultural principles as moderators to further clarify acceptance of mobile commerce in various cultures. Secondly, in this study, perceived ease of use, perceived usefulness,

innovativeness and perceived risk are used as independent variables. In future studies, additional variables may be added to the model to increase the explanatory power of the consumers' intention to use mobile commerce and their attitude towards mobile commerce. Finally, people over the age of 18 living in Turkey participated in the survey. This study may also be performed for users under 18 years of age in the future. In this way, the acceptance of future generations to mobile commerce services can be examined.



5. CONCLUSION

This study focuses on the acceptance of mobile commerce applications by consumers living in Turkey. Moreover, the current literature of mobile commerce is also investigated by looking at the variables that influence consumers' acceptance in Turkey. The study examines the factors that affect mobile commerce acceptance and describes the major variables to support companies in reaching their potential customers.

There are several models in the literature that can be used to predict whether or not consumers will accept and use a new technology. This study contributes to the existence of knowledge in the fields of acceptance of mobile commerce. The Theory of Reasoned Action (Ajzen and Fishbein 1980), the Technology Acceptance Model (Davis 1989; Davis et al. 1989), and the Innovation Diffusion Theory (Rogers 1983) are the fundamentals for existing models of consumers' technology acceptance. Davis (1989) established the Technology Acceptance Model, which is the most widely used of these models. According to the Technology Acceptance Model, consumers' intention to use services has a significant impact on consumers' acceptance of technology.

In this study, based on the Technology Acceptance Model, the research model is constructed to the need to better our understanding of the mobile commerce acceptance drivers. The effects of perceived ease of use and perceived usefulness on consumers' attitude towards mobile commerce and their intentions to use mobile commerce are investigated. Moreover, two more variables; perceived risk and innovativeness are added to the research model and their effects on consumers' attitude towards mobile commerce and their intentions to use mobile commerce are studied.

As it is mentioned in the literature part, e-commerce has grown in popularity in recent years, but it might not be the next real frontier for shopping. Mobile commerce is on the edge of becoming trendy thanks to plenty of technical advancements that make shopping on mobile devices more convenient. Therefore, consumers' shopping habits have changed in time. Consumers may now shop through several platforms and from all across the

planet. They have a variety of opportunities, and they choose brands that have a seamless omni channel experience. Thus, many companies combine offline and online platforms to provide an integrated omni channel experience (Netmera 2018).³

Mobile commerce has the potential to change online purchasing habits and become a major retail platform. Consumers are increasingly dependent on digital tools than it has ever been, and Insider Intelligence predicts that smartphones will replace desktop computers as the dominant platform for online shopping in the next five years (Insider 2020).⁴ "Buy buttons" have been added to social media platforms which allow consumers to make purchases without leaving the website. In addition, numerous businesses have introduced one-click checkout on their websites. Consumers must first provide their payment information before using the one-click option to complete purchases without having to enter it again. Recent surveys have shown that, with the exponential growth of mobile commerce in the last decade, there is an increasing need to consider consumer decision-making on the use of mobile commerce (Sun and Chi 2018; Yim et al. 2017; Fulgoni 2014). Moreover, with Millennials and Generation Z wielding tremendous purchasing strength, acceptance of mobile commerce will continue to expand and become a significant contributor to revenue growth (Insider 2020).

In this study, the research model with four independent variables (perceived ease of use, perceived usefulness, innovativeness and perceived risk) and two dependent variables (consumers' attitude towards mobile commerce, consumers' intention to use mobile commerce) is established. According to output of the study, eight hypotheses were tested and four of them were found to be statistically significant on the acceptance of mobile commerce. The results of the study show that perceived usefulness stands out as the biggest determinant of consumers' attitude towards mobile commerce and consumers' intention to use mobile commerce. Moreover, innovativeness has a significant impact on consumers' attitude towards mobile commerce and their intentions to use mobile commerce. Meantime, perceived ease of use and perceived risk do not have a significant impact on consumers' attitude towards mobile commerce and their intentions to use

³ Netmera (2018). The Rise of Mobile Commerce.

⁴ Insider (2020,12). Rise of M-Commerce: Mobile Ecommerce Shopping Stats & Trends in 2021

mobile commerce. In this sense, the findings of this study provide valuable insight into the factors that influence consumers' mobile commerce acceptance in Turkey. As a result, researchers and companies will be able to determine the factors influencing Turkish consumers' acceptance of mobile commerce in the future. The analytical and conceptual aspects of the subject, as well as the competitiveness of companies in Turkey would be greatly influenced by the depth of study and analyses to be conducted on the subject.



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Footnotes

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APPENDICES

