MOBILE SHOPPING ADOPTION BY FOUNDATION UNIVERSITY STUDENTS IN TURKEY: AN APPLICATION OF THE TECHNOLOGY ACCEPTANCE MODEL (TAM)

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ABSTRACT

Mobile Shopping as Online channels is the most commonly used way of informing the customers about brands and products of a company. Facebook, Instagram, and a lot of smartphone programs are the most traditional ways for creating an image of brands that also help in generating sales revenue. In current times, with technological advancements, new technology mediums have emerged such as the Internet, social media and online marketing. There are various factors linked with the online Mobile shopping technology such as interactivity of the smart telephone which supporting programs and social mediums,which let the brands and traditional physical businesses attent to adapt to the new way of promoting and target there costumers through focusing on selling their products through the mobile online shopping trust level built by online mobile shopping , entertainment of online mobile shopping , offers of online mobile shopping and accessibility of online online mobile shopping. All these factors formed the basis of this research where the impact of these factors was evaluated on the (buying behavior) of a student in foundation Universities in turkey adapted to the mobile shopping style, the aim of this study is to test the relationship between

all (TAM) factors perceived ease of use, usefulness, risk, and attitude toward using and the changes on behavioral intention of using mobile shopping.

Keywords: Mobile shopping, Perceived ease of use, Perceived Usefulness, Risk, Attitude toward using and, the Behavioral Intention of Using Mobile Shopping.

1. Introduction

Turkey's Internet penetration rate is about 51%, according to figures released by the Turkish Statistical Institute in December 2016, a much lower rate than most countries with similar rates of income and technological progress. According to the same statistics, four out of every ten Internet users in Turkey often use the smartphone to access the Internet. While the results of a survey conducted by the Turkish Statistical Institute itself in March 2017, 24.8% of all users of the Internet are buying goods and services online. Those who bought online are aged between 16 and 74 years old.

Revenue in the Turkish "mobile Shopping" market place to be as 6,605 million USD in 2018, were the annual revenue expected to appear with CAGR 2018 -2022 for 12% result in a market volume of 10,400 million USD in the year2022.
The largest segment in the electronics and media get a market volume of 2,428 million USD in 2018, The average revenue per user currently the active amount of 196.40 USD.
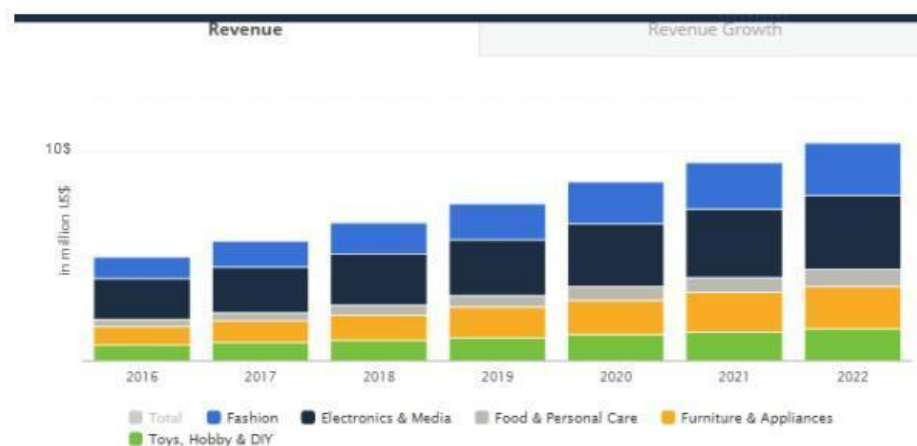

Figure 1.1: Average Revenue Per User (ARPU) [3]

But compared to other countries, these rates and figures are very low. The researcher chose to compare Turkey with Germany to show the differences and gaps between them in this regard.

The monthly active Internet users shares in estimated to be 82.61 % form over the whole population and this increase planned to be raised over 3 % from 79.53% in 2015. In real numbers, this would approximately mean 65 million users by 2021 and growth in number or 2,1 million users. The presented data was collected in May 2016 were the collection account all users that use any kind of Internet device. Depend on statistics 42.80 % of Germans surfing the Internet via a mobile phone and smartphone in 2016. Thus in the same year found out that 78% of the German population used the Internet on their Daily life.
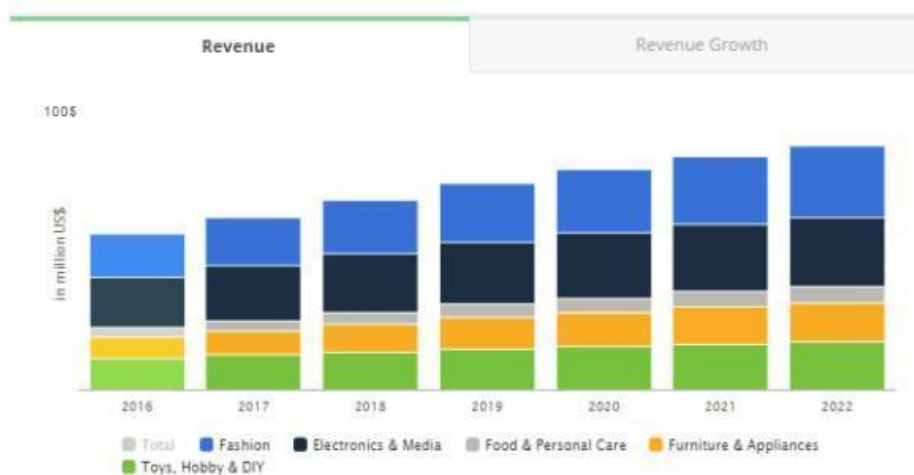

Figure 1.2: The Average Revenue Per User (ARPU) [3]

In 2018 the revenue from using mobile shopping reach 69,775 million USD, Were this revenue expected to reach 89,684 million USD in the time if 2018-2022 with a growth of 6.5% in the Marketplace? in addition to the largest segment were the electronics and media getting market volüme of 21,356 million USD in 2018, also the average revenue per user currently get the amount of 1,356 USD. **[3]**

Faced with this large gap in numbers and ratios between the two countries, the researcher decided to study the factors that stand in the way of Turkish users in front of more trust in mobile shopping.

The researcher identified several factors that will focus his study on them:

- Perceived Ease of use

- Perceived Usefulness
- Perceived Risk

2. Objectives of The Study

This study aims to investigate the behavior of students studying in Foundations universities in Istanbul. The researcher tries to understand the factors that drive these students to use or not to use mobile shopping in their purchasing operations.

The researcher will try to provide logical reasons to explain the behavior of students purchasing, which will be a good reference for companies that offer online sales, and through this study, these companies will review their financial and sales policies to suit the whims of students, which will increase the volume of sales to companies through the Internet, It will also increase student use of mobile shopping in their shopping.

Depend on this study the new research model that found based on TAM which will discuss below contain the perceived ease of use, Usefulness and behavioral intention toward use the outside factors attitude to use actual system, also because the TAM model generated from the positive quantitative research as [2] said that generally quantitative methodology will be adopted in the research process that applies the TAM model.

In reality Researchers by adopting TAM model to a choosing segment the researches objecting to having a full screenshot in order to monitor to the current situation and focus on changes after conducting the model throw a quantitative design in a specific questionnaire survey. [1], [2]

3. Types of E-commerce Models

The practical experience of e-commerce policies has resulted from many types of uses by the government sector or the private sector, ranging from the uses of the corporate sector, the government sector and consumers, as well as the emergence of other ways of applying them other than the usual ways in which they originated (using the computer and the Internet) International). But the important thing is to know the user used in any area can benefit more in this type of trade, where there are categories that suit the applications of e-commerce more than others, the commercial market under it includes different types of the deal and different parties to the customers. Which showed patterns of e-commerce of the most important

species and the weight and sound in the total trade and then the types of less involved and counted, namely: **[6]**

- Busniess, to busiess (B TO B)
- Busniess, to Costumer (B TO C)
- Costumer, to costumer (C TO C)
- Costumer, to business (C TO B)

4. Mobile Shopping in Turkey

According to data obtained from the ICTA, with the move to 4.5G in April 2016, the number of 3G subscribers fell to 15 million, while the number of subscribers reached 4.5G to 56 million subscribers again in March 2017 By March 2017 in Turkey, the number of mobile broadband subscriptions that access Internet services through both laptops and mobile devices reached about 53 million.

In addition, according to ICTA data, the number of Internet subscriptions over broadband reached 12.5 million in Istanbul, 2016. According to other statistical data, the number of smartphone users in Turkey is about 28 million and is expected to reach 40 million by 2018

When the "Advanced Payments Report in Turkey" published by the Interbank Card Center (BKM) is analyzed in 2016, it is understood that the share of online payments within the total number is equal to TRY 68 billion (the total amount is TRY 587 billion) Mobile in all online retail payments from 20% to 30% in Turkey, 2016. The above-mentioned number of mobile broadband subscriptions and data on mobile marketing activities indicate that mobile shopping is evolving as a thriving market in Turkey. **[5]**

5. Technology acceptance model

This model targets the acceptance of technology model directing user behavior towards acceptance of modern information systems (IS). This model consists of factors as beliefs, attitude, intentions and behavioral factors. TAM "aims, particularly, for describing the behavior of users during their use of computers or similar technologies through a huge range of end users computer techniques and the user groups" Of course, the technology acceptance model is the most used model that explains the attitude and intention-behavior of use new electronic technology more from twenty years. TAMs have been considered as an

agreed as a model that can discover and study the acceptability for the new entry of e-commerce technology in workplaces and universities **[2]** For knowing more deeper about the users accepting types based on information systems IS in the workplace. Maintained the behavioral relationship with respect to the Telecommunications Regulatory Authority and proposed the TAM model. The TAM model provides several explanations and linking within 2 main factors the perceived use of ease (U) and the perceived usefulness (EOU), and the attitude of the e-commerce users toward intention of use and the use of computer technology. **[2] [4]**

Table 5.1: Technology Acceptance Model (TAM)
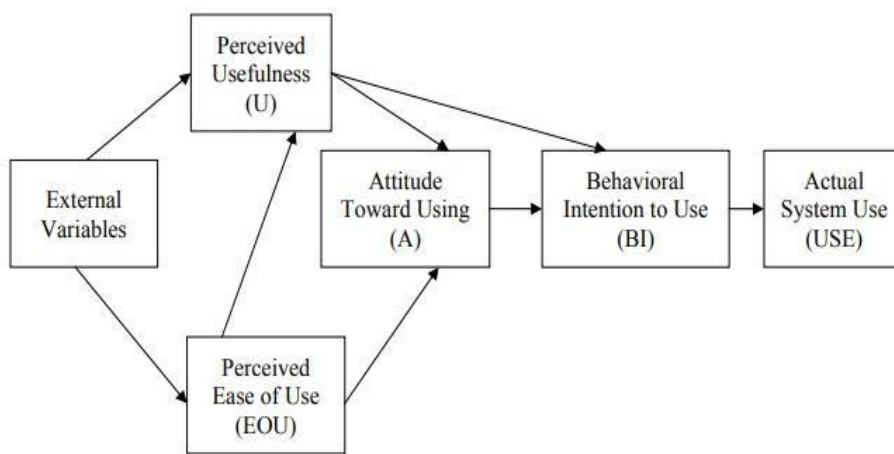
Technology Acceptance Model (TAM)

[4]

6. Data analysis and discussions

6.1 Inferential Statistics

In order to test proposed conceptual model of this study one of the multivariate statistical analysis techniques, namely, Structural equation modeling (SEM) was utilized in this study. SEM is the combination of factor analysis and multiple regression analysis, and it is used to analyze the structural relationship between measured variables and latent constructs.

- Normality Assessment

One of the assumption of SEM is that the data is multivariate normal. In this research normality assessment was carried out through kurtosis statistics. Rescaled standardized kurtosis index for each individual scale items was obtained in AMOS and given in the table

below. Recommended threshold for rescaled kurtosis values is ±2. Blow given normality table shows that all items except PEOU1 and PEOU3 have rescaled kurtosis values significantly less than 3. These two exceptions were not considered to be major problem for normality assumption. By considering the rescaled kurtosis data given below it can be concluded that data does not indicate violation of normality.

Table 6.1: Assessment of Normality

Variable	min	max	skew	c.r.	kurtosis	c.r.
PU5	1.000	5.000	-.994	-5.085	1.102	2.819
INT4	1.000	5.000	-1.168	-5.974	1.854	4.743
INT3	1.000	5.000	-1.113	-5.695	1.330	3.402
INT2	1.000	5.000	-1.138	-5.822	1.578	4.036
INT1	1.000	5.000	-1.122	-5.740	.807	2.065
ATT3	1.000	5.000	-1.084	-5.545	.707	1.808
ATT2	1.000	5.000	-1.301	-6.655	2.471	6.320
ATT1	1.000	5.000	-1.019	-5.212	1.155	2.955
RISK4	1.000	5.000	.521	2.666	-.476	-1.217
RISK3	1.000	5.000	.640	3.274	-.186	-.475
RISK2	1.000	5.000	.500	2.557	-.336	-.860
RISK1	1.000	5.000	.344	1.761	-.389	-.995
PEOU4	1.000	5.000	-1.278	-6.535	1.841	4.709
PEOU3	1.000	5.000	-1.586	-8.113	3.391	8.674
PEOU2	1.000	5.000	-1.252	-6.404	2.252	5.760
PEOU1	1.000	5.000	-1.542	-7.887	3.704	9.474
PU4	1.000	5.000	-1.132	-5.792	1.160	2.966
PU3	1.000	5.000	-1.032	-5.281	.826	2.113
PU2	1.000	5.000	-1.185	-6.059	1.626	4.160
PU1	1.000	5.000	-1.022	-5.229	.503	1.285

- Multicollinearity Assessment

Multicollinearity is a state of very high intercorrelations among the independent variables of the proposed model. Multicollinearity can be assumed to cause serious problems if simple correlation between independent (i.e., predictor or regressor) variables exceeds 0.8 or 0.9).

Correlation between model factors are given in Table 6.2. Independent variables (i.e., predictors) of this study are perceived ease of use and perceived risk. Correlation between these two variables is well below the recommended threshold of 0.8. Therefore, multicollinearity is not considered to be a concern in this study. **[10] [11]**

Table 6.2: Correlations Between Factors

			Estimate
PU	<-->	PEOU	.562
PU	<-->	RISK	-.248
PU	<-->	ATTITUDE	.733
PU	<-->	INT	.738
PEOU	<-->	RISK	-.043
PEOU	<-->	ATTITUDE	.590
PEOU	<-->	INT	.581
RISK	<-->	ATTITUDE	-.299
RISK	<-->	INT	-.307
ATTITUDE	<-->	INT	.828

- Validity and Reliability Assessment

When doing CFA it is necessary to establish convergent validity, discriminant validity and reliability. Convergent validity and discriminant validity is a subtype of construct validity. Convergent validity refers to the degree to which two measures of constructs that theoretically should be related, are in fact related. To ensure the convergent validity, it is necessary to show that measures that should be related are actually related. To establish discriminant validity (also known as divergent validity), it is necessary to show that measurement that are not supposed to be related are in fact unrelated. There are a few measures that are useful for establishing validity and reliability in CFA analysis. These measures are namely, Composite Reliability (CR), Average Variance Extracted (AVE),

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Maximum Shared Variance (MSV), and Average Shared Variance (ASV). Suggested threshold values for these measure were identified and suggested. In order to establish reliability CR value must be greater 0.7. For convergent validity AVE measure must be greater than 0.5 and finally for discriminant validity to hold MSV measure must be less than AVE.

Reliability and validity assessment (table 6.3) given below shows that CR values for all factors are above the suggested threshold of 0.7 and AVE values are also above the minimum acceptable point of 0.5. When it comes to discriminant validity MSV values of PU, PEOU and RISK are well below from AVE values of these factors. However MSV values of ATTITUDE and INTENTION is slightly higher than AVE values of these factors. Since this discrepancies are very small they are not considered to be a major problem for further analysis. By considering the measures of reliability and validity it can be concluded that the constructs of the study model are reliably and valid. [7] [8]

Table 6.3: Reliability and validity assessment

CONSTRUCTS	CR	AVE	MSV
ATTITUDE	0.848	0.652	0.686
PU	0.922	0.703	0.545
PEOU	0.881	0.650	0.348
RISK	0.910	0.717	0.094
INT	0.876	0.642	0.686

- Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) is a multivariate statistical procedure which is used to test how well the measured variables represent the number of constructs. That is, this tool is used to test the factor structure of the dataset. CFA helps to confirm or reject the measurement theory. In this study Confirmatory Factor Analysis (CFA) was conducted in SPSS AMOS version 22.

The hypothesized model is given in Figure 1. This model was obtained after several re-specifications and re-estimations based on modification indices provided by SPSS AMOS version. The main objective of confirmatory factor analysis (CFA) is to assess the extent to which the observed variables are connected to their respective underlying latent factors. For that purpose, the strength of regression paths (i.e., factor loadings) from latent

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factors to their respective observed variables were analyzed. Regression weights given in Table 4 shows that all factor loading are highly significant with p<0.001.

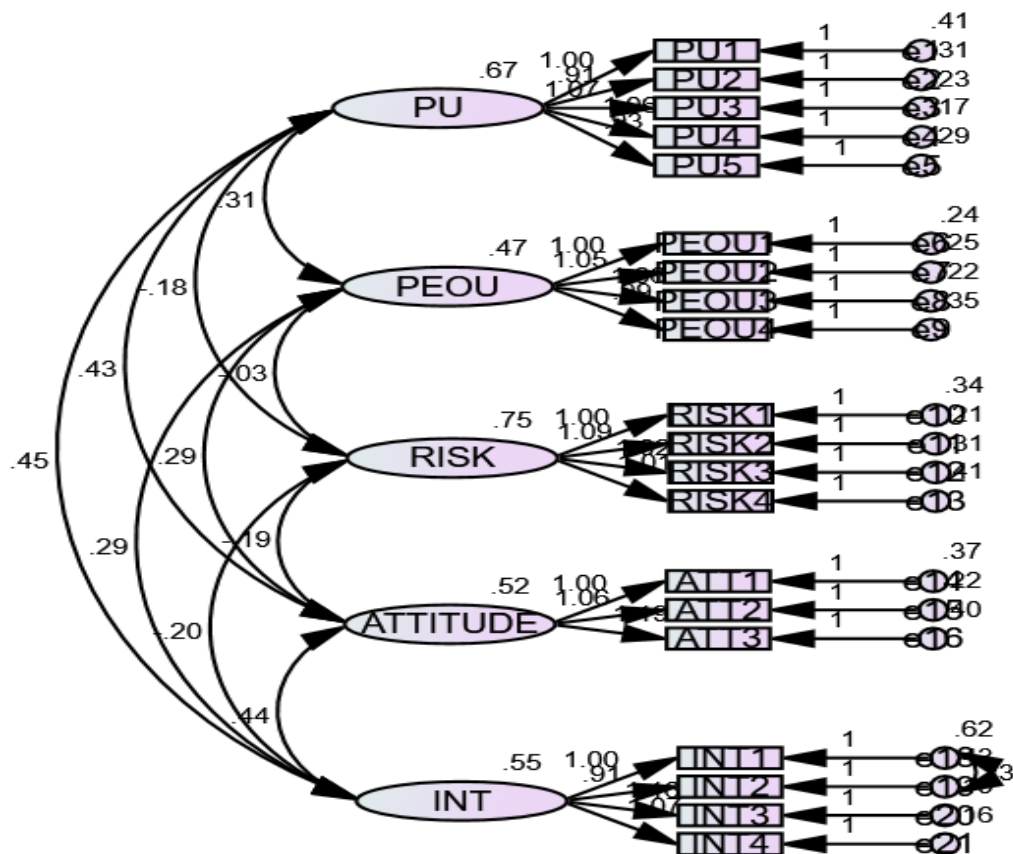**Figure 6.1: CFA Model**

Table 6.4: CFA- Unstandardized Regression Weights

			Estimate	S.E.	C.R.	P
PU1	←-	PU	1.000			
PU2	←-	PU	.909	.083	11.006	***
PU3	←-	PU	1.074	.086	12.500	***
PU4	←-	PU	1.058	.082	12.906	***
PEOU1	←-	PEOU	1.000			
PEOU2	←-	PEOU	1.054	.093	11.285	***
PEOU3	←-	PEOU	1.060	.092	11.504	***
PEOU4	←-	PEOU	.989	.098	10.064	***
RISK1	←-	RISK	1.000			
RISK2	←-	RISK	1.089	.080	13.671	***
RISK3	←-	RISK	1.024	.081	12.570	***
RISK4	←-	RISK	1.014	.086	11.730	***
ATT1	←-	ATTITUDE	1.000			
ATT2	←-	ATTITUDE	1.061	.099	10.759	***
ATT3	←-	ATTITUDE	1.193	.118	10.124	***

INT1	←-	INT	1.000			
INT2	←-	INT	.909	.082	11.065	***
INT3	←-	INT	1.156	.116	9.939	***
INT4	←-	INT	1.075	.108	9.926	***
PU5	←-	PU	.928	.082	11.343	***

***p<0.001

....   Standardized regression weights (i.e., coefficients) are given in Table 6.5 below.

These coefficients are the estimates that have been standardized so that the variances of dependent and independent variables are 1. These standardized coefficients shows how many standard deviations a dependent variable will change, per standard deviation increase in the predictor variable.

Table 6.5: CFA- Standardized Regression Weights

			Estimate
PU1	<---	PU	.787
PU2	<---	PU	.799
PU3	<---	PU	.880
PU4	<---	PU	.902
PEOU1	<---	PEOU	.812
PEOU2	<---	PEOU	.823
PEOU3	<---	PEOU	.836
PEOU4	<---	PEOU	.751
RISK1	<---	RISK	.829
RISK2	<---	RISK	.901
RISK3	<---	RISK	.846
RISK4	<---	RISK	.807
ATT1	<---	ATTITUDE	.763
ATT2	<---	ATTITUDE	.853
ATT3	<---	ATTITUDE	.803
INT1	<---	INT	.685
INT2	<---	INT	.715
INT3	<---	INT	.892

INT4	<---	INT	.891
PU5	<---	PU	.818

.. There are several model fit metrics that can be used to determine goodness-of-fit proposed study model. Suggested threshold for these metrics) and goodness-of-fit statistics of the proposed model is given in the table 6.6 below. By considering the metrics of cmin/df, CFI and RMSEA it can be concluded that proposed model is a well-fitting model. **[9] [7]**

Table 6.6: Model of Fit Metrics For CFA Model

Measure	Threshold	Proposed Model	Remarks
cmin/df	<3 good; <5 permissible	1.813	good
CFI	>0.95 great; 0.90 traditional; >.80 permissible	0.944	great
GFI	>0.95	0.835	
AGFI	>0.80	0.782	close to threshold
RMSEA	<0.05 good; 0.05-0.10 moderate; >0.10 bad	0.072	moderate

- Structural Model (Path Analysis)

While measurement model (i.e., CFA) examines relationship between the latent variables and their measures. The structural model (i.e., path analysis) is the relationship between the latent variables of proposed model.

Structural model of the study is given in Figure 6.2. In this research standardized regression weights (i.e., beta coefficients) were utilized to discuss the results. These standardized coefficients are given on the arrows in the below given figure. Standardized coefficients refer to how many standard deviations a dependent variable will change, per standard deviation increase in the predictor variable.

Squared multiple correlation (i.e., coefficient of determination) for dependent variables Perceived Usefulness (PU), Attitude (ATT) and Intention (INT) are 0.321, 0.610 and 0.731

respectively. Squared multiple correlation is the proportion of the variance in the dependent variable that is predictable from the independent variables. For the proposed model squared multiple correlations implies that 32.1 percent of variation in PU, 61.0 percent variation in ATT and 73.1 percent variation in INT are explained by its predictor variables.
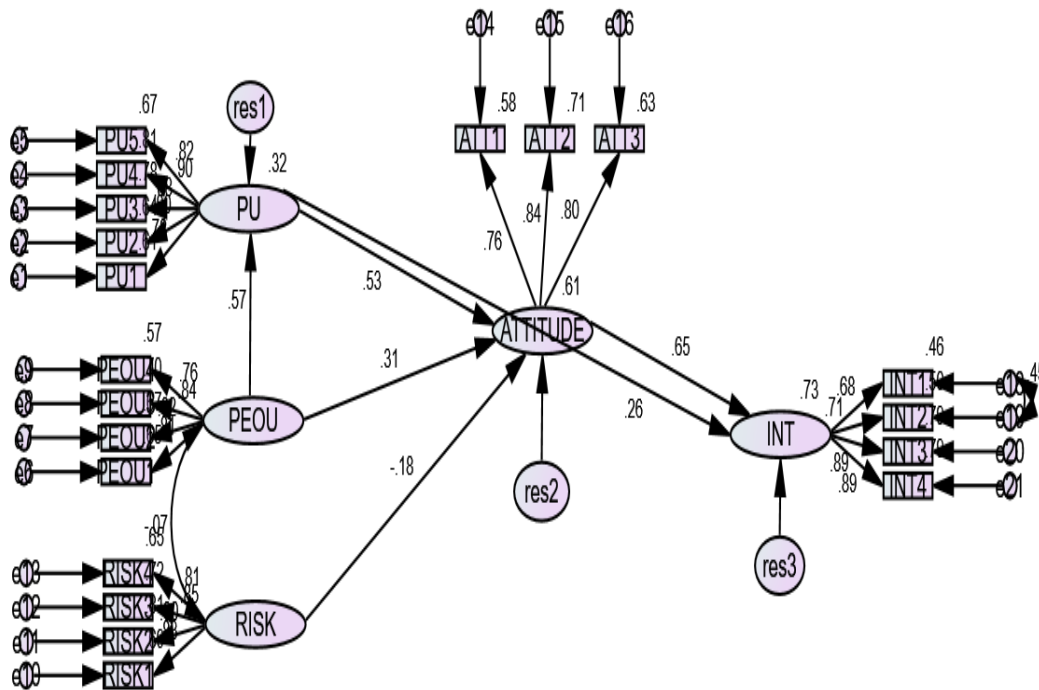

Figure 6.2: Structural Model

Model fit metrics for structural model is given in Table 6.7. By considering the metrics of cmin/df, CFI and RMSEA it can be concluded that proposed structural model is a well-fitting model.

Table 6.7: Model of Fit Metrics For Structural Model

Measure	Threshold	Proposed Model	Remarks
cmin/df	<3 good; <5 permissible	1.853	good
CFI	>0.95 great; 0.90 traditional; >.80 permissible	0.940	Close to great
GFI	>0.95	0.830	
AGFI	>0.80	0.779	Close to threshold

RMSEA	<0.05 good; 0.05-0.10 moderate; >0.10 bad	0.074		moderate

Regression weights of structural model which is given in Table 6.8 highlights the following conclusion.

Perceived ease of use (PEOU) (β_{PEOU}=0.681 SE=0.108, p<0.001) of mobile shopping was found to have positive significant relationship with Perceived usefulness (PU) of mobile shopping

While perceived usefulness (PU) (β_{PU}=0.464, SE=0.082, p<0.001) of mobile shopping and perceived ease of use (PEOU) (β_{PEOU}=0.320, SE=0.091, p<0.001) of mobile shopping were found to have positive significant relationship with attitude (ATT) toward using mobile shopping, perceived risk (RISK) (β_{RISK}=-0.147, SE=0.054, p=0.006) of online shopping were found to have negative significant relationship with attitude (ATT) toward using mobile shopping.

On the other side, perceived usefulness (PU) (β_{PU}=0.235, SE=0.086, p=0.006) of mobile shopping and attitude (ATT) (β_{ATT}=0.670, SE=0.122, p<0.001) toward mobile shopping were found to have positive significant relationship with behavioral intention (INT) of using mobile shopping.

Table 6.8: Structural model regression weights

			Estimate	S.E.	C.R.	P
PU	<---	PEOU	.681	.108	6.295	***
ATTITUDE	<---	PU	.464	.082	5.633	***
ATTITUDE	<---	PEOU	.320	.091	3.527	***
ATTITUDE	<---	RISK	-.147	.054	-2.736	.006
INT	<---	ATTITUDE	.670	.122	5.476	***
INT	<---	PU	.235	.086	2.739	.006

***p<0.001

Summary of hypotheses testing results are given in the table 6.9 below. Table below

shows hypothesis number, hypothesis description and remarks about its acceptance. SPSS AMOS 22 path analysis results showed that all six proposed study hypotheses were statistically significantly supported.

Table 6.9: Summary of hypotheses testing

Hypothesis	Description	Remarks
H1	There is a positive relationship between the ease of use of mobile shopping and the usefulness of mobile shopping	Supported
H2	There is a positive relationship between the usefulness of mobile shopping and the attitude toward using mobile shopping.	Supported
H3	There is a positive relationship between the ease of use of mobile shopping and the attitude toward using mobile shopping.	Supported
H4	There is a negative relationship between the risk of mobile shopping and the attitude toward using of using mobile shopping.	Supported
H5	There is a positive relationship between the perceived usefulness of mobile shopping and the behavioral intention of using mobile shopping.	Supported
H6	There is a positive relationship between the attitude toward using mobile shopping and the behavioral intention of using mobile shopping.	Supported

Conclusion

In this research, it is found that when mobile shopping apps are easy to use then users will perceive it as useful. Therefore mobile shopping application developers should develop such mobile shopping interfaces which are easy to use from the end-user point of view. Findings of this research also showed that ease of use of mobile application directly and positively influences its perceived usefulness. By designing easy to use systems developers can form positive perceptions in the mind of consumers about the usefulness of mobile shopping. In this study, it is also found that usefulness as one of the main factors that have a strong positive impact on attitude toward using mobile shopping. Therefore, if mobile shopping providers make their system useful they can form positive perceptions and attitudes

in the mind of consumers toward using mobile shopping platform. Furthermore, the usefulness of mobile shopping is founded to get a direct and positive effect on the use of mobile shopping. Therefore, by offering useful mobile shopping platforms it is possible to establish positive attitudes in the mind of consumers toward such systems and at the same time, it is possible to directly influence the adoption intention of consumers toward such platforms. Another important factor that founded to get a direct influence on behavior intention and attitude. This resulted in when consumers have a favorable attitude toward mobile shopping platforms they will prefer to adopt and use it. This research showed that perceived risk of mobile shopping has a significant negative impact on attitude toward using such platforms. This means that when consumers perceive such platforms risky they will form negative perceptions toward such a system in their mind. Therefore mobile shopping providers should take into consideration critical factors that might negatively influence the attitudes of mobile shopping users and provide necessary solutions.

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