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# EVALUATING THE ROLE OF PERCEIVED USEFULNESS, PERCEIVED EASE OF USE AND PERCEIVED RISK IN ONLINE SHOPPING: APPLICATION OF TECHNOLOGY ACCEPTANCE MODEL TOWARDS THE ONLINE PURCHASE INTENTION

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## **Abstract**

The Technology Acceptance Model (TAM) derived by Davis (1989) has been widely accepted to predict the intention to use online shopping. Thus, this study endeavours to address the intention for online shopping among the Sri Lankan women with TAM to provide insights on developing online marketing strategies in Sri Lankan context and validate the application of TAM in developing country contexts. The conceptual model of technology acceptance model with integrating the perceived risk is proposed to use in examining the online shopping behavior of consumers. The sample of the study consisted of a total of 134 women in Colombo District, Sri Lanka and data were collected through the administration of a structured questionnaire. Spearman rank correlation coefficient and kruskalwallistest were employed to test hypothesis and other expectations. The results of the study revealed that Perceived usefulness, Perceived ease of use and Perceived risk can be accepted as the determinants of Online purchase intention. It demonstrates both age groups and occupational levels exist statistical differences on Perceived usefulness, and Online shopping intention, while there is no statistical difference on Perceived risk. Overall this research is important in the sense that it investigates the nature of the technology acceptance of female related purchasing in the South Asian context

*Keywords:* Online Shopping Intention; Perceived Ease Of Use; Perceived Usefulness; Perceived Risk; Technology Acceptance Model

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## **1. Introduction**

Online shopping is an easy and comfortable way of shopping for a large range of products physically. The growth of online shopping has generated considerable interest among academic researchers (Rohm and Swaminathan 2004). The online shopping designed for consumers to directly buy products from a seller over the Internet without an intermediary service. An online shop, e-shop, e-store, Internet shop, web-shop, webstore, online store, or virtual store evokes the physical analogy of buying products or services at a bricks-

and-mortar retailer or shopping centre. Thus, the Technology Acceptance Model (TAM) derived by Davis (1989) has been widely accepted to predict the intention to use online shopping. TAM has been used to predict many aspects of online shopping such as online shopping activity and actual purchases (Klöppling and McKinney 2004). Thus TAM also has been tested in different cultural contexts (UK; European), (UK; Greek), culture. (Vrechopoulos, Siomko and Doukidis 2001). However, there are no valid studies conducted in Sri Lanka to examine the online shopping behaviour of Sri Lankans. Thus, this study endeavours to address the intention for online shopping among the Sri Lankan women with TAM. This study would provide insights on developing online marketing strategies in Sri Lankan context and validate the application of TAM in developing country contexts. Validation of a theoretical construct developed to measure the technology acceptance in South Asian context are a key priority.

## 2. Literature Review

### 2.1 Theory of Technology Acceptance Model and Hypothesis

#### 2.1.1 Technology Acceptance Model

One of the most influential models to explicate and predict the information system and adoption and usage is TAM as it describes how users come to accept and use an information technology (Davis et al., 1989). Thus, this model explains the determinants of technology acceptance. The TAM is a major theoretical input towards both the information systems usage and acceptance behaviour (Davis, Bagozzi, and Warshaw, 1989). Recently various types of researches which were based on online have come into view in different observations (online shopping intention) under different contexts (cultures, countries) and under different control factors (i.e. demographics) (Zhou, Dai, and Zhang 2007), (Hansen and Jensen 2009) and different industries (i.e. electronic banking, apparel, retail stores) (Kim and Park 2005). The TAM was applied in many online based studies as it is renowned as a powerful theory in information technology (Venkatesh, 2000). The TAM has been applied in e-learning (Masrom, 2007); e-government services. (Suki and Ramayah, 2010); 3G mobile services (Suki et al., 2011); and Electronic medical recording (Mohad, Mastura and Mohamad 2005). The TAM has major concerns on two variables: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Davis et al., 1989).

#### 2.1.2 Perceived Usefulness.

Perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, et al., 1989). As per Davis (1989), within the organizational context when a system is high in perceived usefulness it is believed that there is a positive use – performance relationship. It is found that the perceived usefulness is the major factor which decides the usage and intention. (Davis et al., 1989), According to his explanation when the system is useful for the users, then they have intention to use the technology and lead to actual use. Based on the previous research using TAM it confirms that Perceived usefulness has a positive influence on the behavioural intention to adopt online banking (Gurting and Dubisi, 2006) and plays a major role to determine users' acceptance of e-Government services (Suki and Ramayah, 2010). Perceived usefulness was identified as a key factor which influences subscribers' intention to use 3G mobile services (Suki et al., 2011). Therefore, it can be posited that:-

H<sub>1</sub> : the relationship between online purchase intention and perceived usefulness of information technology is positive

### 2.1.3 Perceived Ease of use

Perceived ease of use is the degree to which a person believes that using a particular system would be free of effort” (Davis et al., 1989). Number of research conducted based on the TAM indicates that perceived ease of use positively influence the behavioral intention to use a system (Gurting et al.,2006),(Suki et.,al.2010). Perceived ease of use has been accepted as a significant factor of subscribers’ intention to use 3G mobile services(Suki et al., 2011). Some research findings depicts that the key factor of deciding the information system usage or intention is perceived usefulness while perceived ease of use influences on perceived usefulness (Ataran, and Nami.2011). In addition to the above findings,some other studies have confirmed that the perceived ease of use significantly negatively influence the intention to use .Generally It could be assumed that when a system becomes easy to use, the users would have the intention to use the system. Accordingly it hypothesizes that:

H<sub>2</sub> : the relationship between online purchase intention and perceived ease of use of information technology is positive

### 2.1.4 Perceived Risk

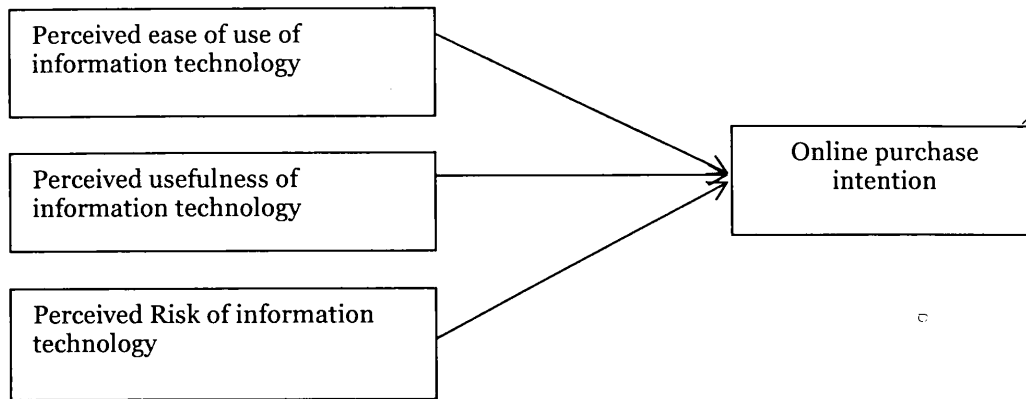
Buyers often face problems when they plan to buy product and service. Therefore they hesitate to purchase because buyers may perceive a certain degree of risk in most purchase decisions. (Roselius, 1971). According to Dowling and Staelin (1994) perceived risk is the consumer's perceptions of the uncertainty and adverse consequences of buying a product or service. In attempts to identify the components of perceived risk, researchers have investigated consumers' perceived risks as an influential factor of online shopping purchase decisions.(Ko,Jung,Kim,Shim 2004).. Many researches indicate that the perceived risk is in several forms as financial, social, time, psychological, performance and physical risk (Kaplan and Jacoby, 1972). “These several forms of risk can influence on e services as a whole (Featherman,Pavlon 2003). Social risk refers to the disapproval of purchased product by family, friends or neighbors (Dowling and Staelin1994). Financial risk occurs when the purchased product does not work properly (Garner 1986). Bauer (as sited in Featherman,et,al 2003) defined the time risk as the time wasted when the product is repaired or replaced. Psychological risk is the negative feeling in a consumer’s mind towards a malfunctioning product (Kaplan et al., 1972). Bauer (as sited in Grewal, Gotlieb, Marmorstein, 1994) defines Performance risk means the perception that the product may not function properly . The perception of product may harm the health or safety when it does not work properly is about physical risk (Roselius, et al.,1971). Featherman,Pavlon (2003)found out that intention and adoption of e-service has a negative significant relationship with perceived risk. Thus, the following hypothesis is derived to examine whether there is a relationship between online purchase intention and perceived risk of information technology.

H<sub>3</sub>: the relationship between online purchase intention and perceived risk of information technology is negative

## 3. Study Design and Methods

This research develop a model based on the current TAM (Davis et.,al 1989). The develop model tries to obtain a broader view of factors related to technology acceptance than has been included in previous research projects. This broader view included consideration of additional external factor of perceived risk component shown in figure1.As it is conceptualized that the online purchase intentions is the product of consumer assessment of perceived usefulness,perceived ease of use and perceived risk of information technology.

Figure 1: Technology Acceptance Model with Perceived Risk Component



Accordingly, the online purchase intention is dependent upon, perceived usefulness, perceived ease of use and perceived risk of information technology. According to the TAM of Davis (1989), perceived usefulness and perceived ease of use are the key determinants of intention to use an information technology. Recently many researchers have found that risk also influences online purchase intention (Li and Huang, 2009), (i.e. Featherman et al., 2003). Therefore perceived risk factor has been incorporated in this model as a variable which can influence the online purchase intention.

The collected data are analysed by Spearman rank correlation analysis and Kruskal Wallis test via Statistical Package for Social Sciences (SPSS) version 16 computer program and reliability of study constructs was examined using Cronbach's coefficient alpha ( $\alpha$ )-value. Spearman rank correlation analysis is used to looking for a monotonic relationship between independent variables and dependant variable. Kruskal wallis test is used to find out that two demographic factors of age and occupation level have any impact on each variables.

#### 4. Study Variables, Questionnaire Design and Data Collection

The variables used for each study constructs are given in Table 1. Thus, Davis, et al.,'s study (1989) is used basically to operationalize the perceived usefulness and perceived ease of use. Additional two variables from Nelson and Adams's (1992) are also used to operationalize perceived ease of use. Perceived risk is operationalized aligning to the Featherman's (2003) study. The study of Klopping and Mcking (2004) has been considered to operationalize 'online purchase intention'.

##### 4.1 Data Collection and Questionnaire Design

The data for the study were collected through a questionnaire survey. The questionnaires are distributed among the sample of 150 respondents. The questionnaire consisted of two parts: Part 1 addressed the consumer demographics while Part two addressed the perceived usefulness, ease of use and risk of information technology and online purchase intention. Five point Likert scales were used to measure the perceived usefulness, ease of use and risk of information technology and online purchase intention.

##### 4.2 Sample

The sample of the study consisted of 134 employed women between the ages of 18 years to 50 years at the Western Province of Sri Lanka. These sample respondents demonstrate a busy life as they are supposed to engage in their family matters and workplace responsibilities. As such, it is assumed that they are compelled

to behave in a manner to focus on convenience in shopping. Online shopping might be an alternative for ensuring the convenience shopping. Therefore, it is assumed that this segment fits with the need of examining the intention of employed women towards online shopping. Participation was voluntary and each individual consented to participate in the study.

Table 1: Operationalization of Perceived Usefulness, Ease of Use and Risk and Online Purchase

Construct	Operationalization	Reference
Perceived Usefulness (PU)	Quickness	Davis et al, 1989
	Easiness	
	Time saving	
	Usefulness	
Perceived Ease of Use (PEU)	Mental effort	Adams, Nelsons, and Todd, 1992
	Time Taking to learn	
	confusion	
	Accuracy	Davis et al, 1989
	Frustration	
Easy to use		
Perceived Risk (PR)	Financial Risk	Featherman, et al., 2003
	Performance risk	
	Privacy risk	
	Psychological risk	
	Social risk	
	Time risk	
	Overall risk	
Online Purchase Intention (OPI)	Superiority	Klopping and Mcking, 2004
	Desirability	
	Convenience	
	Opinion	
	Usage	

Participation was voluntary and each individual consented to participate in the study. The study's goals, objectives, and the importance of the research are explained in orally.

## 5. Data Analysis and Discussion

### 5.1 Reliability of the Study Constructs

This study considers the Cronbach's coefficient alpha ( $\alpha$ ) as it is most widely used to assess the reliability of a measurement scale with multi-point items. Thus, Table 2 shows that the overall value of the ' $\alpha$ ' for the four study constructs used in the study are around 0.8.

Table 2: Overall Value of the Cronbach's Alpha for the Four Study Constructs

Study Construct	Overall Value of the Cronbach's Alpha
Perceived Usefulness	0.875
Perceived Ease of Use	0.778
Perceived Risk	0.845
Online Purchase Intention	0.892

### 5.2 Hypotheses testing

The proposed research model is evaluated by using the spearman rank order correlation ( $r_s$ ) in order to examine the monotonic relationship between each constructs of the TAM. The table 03 depicts that the spearman rank order correlation coefficient values ranged from -.346 to .692. The hypothesis testing is illustrated based on the Spearman's correlation coefficient values recorded in the table 04.

Table 03. Spearman Rank Order Correlation Coefficient for the TAM variables ( $r_s$ )

Independent variables	Online Purchase Intention(OPI)
Perceived Usefulness(PU)	.692**
Perceived Ease of Use(PEU)	.427**
Perceived Risk(PR)	-.259*

\*\*Correlation is significant at the 0.01 level

\* Correlation is significant at the 0.05 level

#### 5.2.2.1 The Relationship between Online Purchase Intention and Perceived Usefulness of Information Technology

Spearman's correlation coefficient analysis proves that there is a positive significant relationship between online purchase intention and perceived usefulness of information technology with the mathematical value of  $r_s$ , 0.693 which is statistically significant ( $p = 0.000$ ).

#### 5.2.2.2 The Relationship between Online Purchase Intention and Perceived Ease of Use of Information Technology.

As per the statistical data, it is recorded a spearman correlation coefficient of  $r_s$ , .427 which is significant ( $p = 0.000$ ) and indicates a positive relationship between the online purchase intention and the perceived ease of use of information technology.

#### 5.2.2.3 The Relationship between Online Purchase Intention and Perceived Risk of Information Technology.

A significant negative relationship between online purchase intention and perceived risk of information technology is found. Spearman's correlation coefficient value is reported as  $r_s$ , -.259 which is significant ( $p = 0.003$ ). The above mathematical value further explains that these variables are negatively correlated.

Three hypothesis of H1, H2 and H3, are confirmed according to the Spearman's correlation coefficient analysis. Moreover, the analysis shows that the two determinants perceived usefulness of information technology and perceived ease of use of information technology are positively associated with the online purchase intention, while the perceived risk of information technology indicates negative effect on online purchase intention.

#### 5.2.2.4 Impact of Women's Age on Variables of Technology Acceptance Model with Perceived Risk Component.

The impact of two consumer demographic variables (i.e. consumer age and occupation) was considered as these two variables are considered highly with the use of information technology for purchases. Thus, Table 4 and 5 show the Kruskal Wallis test statistics on how the consumers' age and occupation level affects the TAM variables.

### 5.2.2.5 The impact of women's age on variables of technology acceptance model with perceived risk component.

Table 4. Age Impact on TAM variables

Variables	Mean Rank				Chi-square value	Asymp. Sig.
	18-30	31-40	41-50	50<		
Perceived Usefulness (PU)	71.29	80.17	38.78	63.17	17.686	.001
Perceived Ease Of Use (PEU)	52.98	90.59	66.72	69.67	22.218	.000
Perceived Risk (PR)	67.31	61.13	72.63	78.79	2.448	.485
Online Purchase Intention (OPI)	67.34	79.88	52.46	57.96	8.108	.044

a. Kruskal Wallis Test. b. Grouping Variable: Age. c.  $df= 2$ .

Four age levels were considered and therefore the mean ranks for these four age levels on the TAM variables were calculated. Thus, the data of Table 4 shows that no statistically significant difference among the groups occurred for the scores of PR ( $\chi^2=2.448$ ) [ $p>0.05$ ]. However statistically significant differences among three groups occurred for the PU ( $\chi^2=17.686$ ), PEU ( $\chi^2=22.218$ ) and OPI ( $\chi^2=8.108$ ) [ $p<0.05$ ].

### 5.2.2.6 The impact of women's occupation on variables of technology acceptance model with perceived risk component.

Table 5. Occupation Impact on TAM Variables

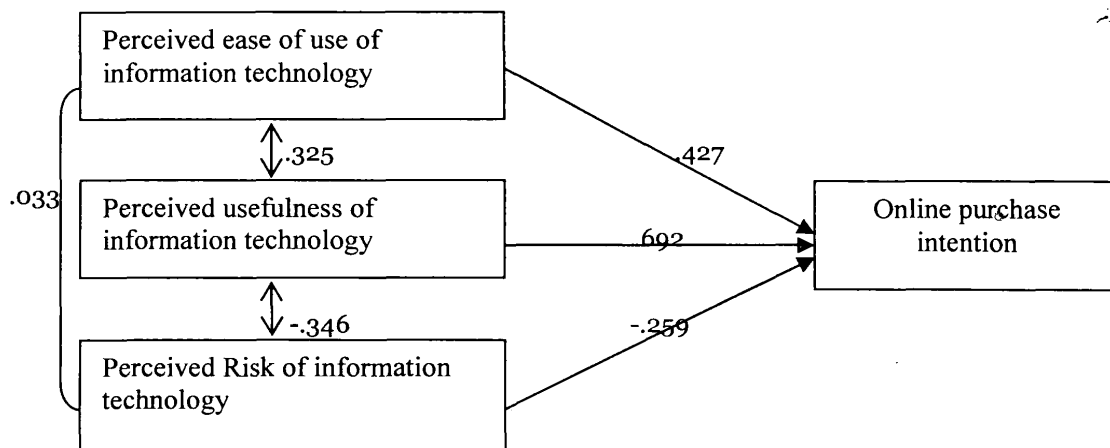
Variables	Mean Rank			Chi-square value	Asymp. Sig.
	Self Employment	Managerial	Non Managerial		
Perceived Usefulness (PU)	88.69	62.22	66.14	6.613	.037
Perceived Ease of Use (PEU)	83.94	63.89	68.97	3.849	.146
Perceived Risk (PR)	69.89	64.61	69.56	.551	.759
Online Purchase Intention (OPI)	88.61	62.70	65.69	6.370	.041

a. Kruskal Wallis Test. b. Grouping Variable: Occupation. c.  $df= 2$ .

Table 5 indicates the Kruskal-Wallis statistics in relation to the occupation level and variables of TAM. Accordingly it shows that no statistically significant differences exist among the groups in PEU ( $\chi^2=3.849$ ) and PR ( $\chi^2=.551$ ) [ $p>0.05$ ], while there exist statistically significant differences among the groups in PU ( $\chi^2=6.613$ ) and OPI ( $\chi^2=6.370$ ) [ $p<0.05$ ].

## 6. Discussion and Conclusion

Figure 2. The results of Technology Acceptance Model with Perceived Risk Component.



Number of research studies have been met with the Technology Acceptance Model (TAM) and Technology Acceptance Model 2 (TAM2) in order to identify what specific factors influencing the online purchase intention. Accordingly this research has been mainly conducted for finding out the key factors of the online purchase intention among the women in Sri Lankan context. The results of the previous researches state, both the perceived ease of use (PEU) and perceived usefulness (PU) would be influencing factors in a person's intention to use Information System (Davis et al, 1989), (Rouibah, Ramayah and May, 2011), (Ataran et al., 2011). Some research expected primary factor influencing online purchase intention is only perceived usefulness (PU) (Ruslan, Ummi, Noornina and Norazuwa, 2005). With the outcome of Spearman rank correlation values this study has come across both perceived usefulness (PU) and perceived ease of use (PEOU) play the equal roles in influencing online purchase intention. Previous technology acceptance research demonstrates a significant relationship between a user's perceived ease of use and a user's perceived usefulness (Li et al., 2009). Ataran (2011) explained that Perceived ease of use impacts on Perceived usefulness positively in relation to the acceptance of technology Acceptance Model. This research has identified that Perceived risk is salient determinant on online purchase context. As noted in previous research Perceived risk has been considered as an influencing factor of online shopping purchase decisions. As per the results the Perceived risk represents a negative influence on the online purchase intention. Li and Hung (2009) illustrated that Perceived risk behaves negatively towards the Perceived usefulness by confirming the negative correlation value between the Perceived risk and Perceived usefulness. In this study it used Kruskal Wallis test, in order to find out whether different age groups and occupation levels have an influence on the data in the Perceived ease of use, perceived usefulness, perceived risk, and Intention to use online shopping. It can be clearly stated that age group has no influence on Perceived risk, while there is an influence on Perceived ease of use, Perceived usefulness and Online purchase intention. In relation to the occupational level, it seems that there is an influence towards Perceived ease of use and Online shopping Intention except Perceived usefulness and Perceived risk.

This study was carried out to recognize key determinants of Online shopping intention in South Asian context by applying the Technology Acceptance Model. The results demonstrate that Online shopping intention can be illustrated in terms of Perceived usefulness, Perceived ease of use, and Perceived risk



### *Limitations and Implications*

Limitation of this study is respondents, all of them from the western province and so the results may not reflect the full diversifies of beliefs, attitude and intention towards Internet shopping. The respondents have been collected from a homogeneous group as working women. Thus the results are more meaningful to the women. Hereafter the online retailer should pay their greater attention to the Perceived risk same as the Perceived usefulness and Perceived ease of use as it was accepted in this study as a key factor of Online shopping intention. Web sites of online vendors should be evolved and changed over certain period of time in order to meet the renewing requirements of the online users.

Future research would be more meaningful when the sample can consist both men and women covering a wide geographical area. The study should be employed a longitudinal approach to identify the factors determine the Online purchase intention.

**Acknowledgment:** The authors would like to thank all the people who have contributed to succeed this research paper.

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