



“Empirical Investigation Of Technology Acceptance Model Towards Digital Wearable Devices”

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Abstract

As demonstrated in the theory of reasoned Action, the Technology Acceptance Model postulates that the use of an information system is determined by the behavioral intention, but on the other hand, that the behavioral intention is determined by the person’s attitude towards the use of the system and also by his perception of its utility. According to Davis, the attitude of an individual is not the only factor that determines his use of a system, but is also based on the impact which it may have on his performance. Therefore, even if an employee does not welcome an information system, the probability that he will use it is high if he perceives that the system will improve his performance at work. Besides, the Technology Acceptance Model hypothesizes a direct link between “perceived usefulness “and “perceived ease of use”. With two systems offering the same features, a user will find more useful the one that he finds easier to use.

Kay words- Technology, Model, Behavior

Introduction

Based on the principle of rational action, Davis (1986) developed a technology acceptance model that is more specifically related to estimating the acceptability of information systems. The purpose of this model is to estimate the acceptability of the device and to identify the changes that users need to make to the system to make it acceptable. This model suggests that the acceptability of an information system is determined by two main factors: “perceived usefulness “and “perceived ease of use”.

“Perceived usefulness “is defined as being the degree to which a person believes that the use of a system will improve his performance. “Perceived ease of use” refers to the degree to which a person believes that the use of a system will be effortless. Several factorial analyses

demonstrated that “perceived usefulness” and “perceived ease of use” can be considered as two different dimensions (Hauser et Shugan, 1980; Larcker et Lessig, 1980; Swanson, 1987).

As demonstrated in the theory of rational action, the technology acceptance model assumes that the use of the information technology base is strong for behavioral purposes, but on the other hand, the behavioral purpose is firmly determined by the attitude of the person leading to its use. By the intensity of the system and its usefulness. According to Davis, the attitude of an individual is not the only factor that determines his use of a system, but is also based on the impact which it may have on his performance. So, even if an employee does not welcome the information system, it is more likely that he will use it if he thinks the system will improve his efficiency at work. In addition, the technology acceptance model visualizes a direct link between “perceived usefulness” and “ease of use”. With two systems offering the same features, a system that seems easy to use will be more useful (on Dillon and Morris, 1996).

Review of literature

It is essential to understand the distinction and differences between theoretical and conceptual framework. Theories represent attempts to interpret the world by observing particular phenomena and endeavoring to determine why they are as they appear to be (Anderson, Curtis, & Wittig, 2014). Acceptance of a theory dictates how researchers perceive and interpret phenomena according to the principles which are propounded by the theory. Theories facilitate analysis and allow predictions and inferences to be made, which are tested by the results which are generated by research studies (Myerson 2013) and provide explanatory frameworks. The theory pertaining to a particular phenomenon could be considered to represent a body of generally accepted knowledge (Thomas, 2007) and a well-formulated explanation or model can describe it scientifically in a manner which enables the theory to be verified (Schafersman 1994). Theoretical frameworks have been defined in a number of different ways by writers and researchers, depending upon how they are constructed and also the ways in which they provide the theoretical foundations of research studies. For D’Amour, Beaulieu, Rodriguez, and Ferrada-Videla (2004), a theoretical framework is a set of connections between different concepts which have been derived from a verifiable body of evidence in a particular body of knowledge. By contrast, Taillefer, Dupuis, Roberge, and LeMay (2003) describe a theoretical framework as a model which details the structure of a study, through the interconnected relationships between the explanations of which theory is comprised

Widely acknowledged as one of the most influential theoretical models in Information System discipline, the TAM was introduced by Davis ([1989](#)) to examine the antecedents of users’ adoption intention of information communication technology (Legris, Ingham &

Collerette, [2003](#); Ooi & Tan, [2016](#); Wu & Chen, 2017). The TAM model posits that “perceived ease of use” and “perceived usefulness “ are influential factors in determining users’ adoption intention (Davis, [1989](#)), being applied in various contexts since then such as online banking (Pikkarainen et al., [2004](#)), mobile commerce (Wu & Wang, 2005), healthcare (Holden & Karsh, [2010](#); Pai & Huang, [2011](#)), sports websites (Hur, Ko & Claussen, [2012](#)), social networking sites (Choi & Chung, [2013](#)) and healthcare wearable technology (Gao, Li & Luo, [2015](#)). Although there is some criticism of the TAM (Bagozzi, [2007](#); Benbasat & Barki, [2007](#); Read, Robertson & Mc Quilken, [2011](#)), it is generally acknowledged as one of the most preferable theoretical models in explaining users’ adoption intention of information technology (Chuah et al., [2016](#)). Therefore, we adopted TAM as one of our fundamental theories to formulate constructs in this study.

Objectives

The aim of this study was to use the Technology Acceptance Model (TAM) as a framework for quantitatively describing the perceived useful and “perceived ease of use”, attitude to use, and behavioral intention among youngster towards digital wearable devices.

METHODOLOGY:

This study adopted descriptive survey design; the study was conducted in Mumbai City. The sample size of the study was 250. The data was collected through structured questionnaires. The main objective of this paper is that find out the acceptance of digital wearable device by using TAM. Technology acceptance model was used in this study to know the relationship between “perceived usefulness “ (PU), “perceived ease of use” (PEOU), “attitude towards usage “(ATU) and “behavioral intention to use digital technology “(BIU). “perceived usefulness “ (PU) means the degree to which a person believes that using digital wearable device would enhance his/her performance in the course of action, whereas “perceived ease of use” refers to the individual’s perception that using the digital wearable device will make themselves free of hardship and hard effort. Based on the objective, the following hypotheses were developed and tested using SPSS.

H1: “perceived usefulness “ will have a significant influence on “attitude towards usage “of digital wearable device

H2: “perceived ease of use” will have a significant influence on “attitude towards usage “of digital wearable device

H3: “perceived ease of use” will have a significant influence on “perceived usefulness “.

H4: “attitude towards usage “of digital wearable device will have a significant influence on user’s behavioural intention to use the digital wearable device.

Research Framework

In this study, TAM was divided into four aspects: “perceived usefulness “, “perceived ease of use”, attitude toward using, and intention to use, as indicated in Figure below

Table: The survey questions

Construct	Items	Measurement items
“perceived usefulness “	PU1	The degree to which digital wearable devices are believed to be useful for life or work
	PU2	I think using digital wearable device would help me improve my physical health.
	PU3	Using the digital wearable device would enhance my effectiveness in monitoring my physical health.
	PU4	Based on my perception of digital wearable device, I believe they provide good features.
“perceived ease of use”	PEOU1	I think the interaction with the digital wearable device is clear and understandable.
	PEOU2	It would be easy for me to become skillful at using digital wearable device.
	PEOU3	I think it is easy to get the digital wearable device to do what I want it to do.
	PEOU4	I think that it takes low mental effort to use digital wearable device.
Attitude towards using	AU1	It is a positive influence for me to use digital wearable device at my work and personal life.
	AU2	I think it trend to use digital wearable device in day to day life.
	AU3	My relatives and friends think that I should use digital wearable devices.
	AU4	I am very skilled at using digital wearable devices.
Intention to Use	IU1	I think I know more about innovative digital wearable products than My circle of friends.

	IU2	I believe that the personal information is safe and secure and no related harm.
	IU3	I believe that the digital wearable devices and their applications provide accurate information.
	IU4	Using digital wearable devices will make my life more compatible and reliable.

Reliability testing was performed to ensure that all research items are reliable. Cronbach's alpha was calculated to ensure the consistency of the data and the result same showed in the below table

Reliability test

Variable	No. of items	Cronbach's Alpha
"perceived usefulness " of Digital Wearable Device(PU)	4	0.796
"perceived ease of use" of Digital Wearable Device (PEOU)	4	0.810
"attitude towards usage "of Digital Wearable Device (ATU)	4	0.874
Behavioral intention to use the Digital Wearable Device (BIU)	4	0.866

Reliability Analysis

In this study, we employed Cronbach's alpha (alpha reliability) to test the internal consistency of questionnaires. The results showed that the Cronbach's alpha of "perceived usefulness " was 0.796, indicating the internal consistency of questionnaires was good; of "perceived ease of use" was 0.810, indicating good; of use attitude was 0.874, indicating good; and of use intention reached 0.866, indicating excellent.

Correlation Table

	"perceived usefulness " of	"perceived ease of use" of	"attitude towards usage	Behavioral intention to use
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	Digital Wearable Device(PU)	Digital Wearable Device (PEOU)	“of Digital Wearable Device (ATU)	the Digital Wearable Device (BIU)
“perceived usefulness “ of Digital Wearable Device(PU)	1			
“perceived ease of use” of Digital Wearable Device (PEOU)	.760**	1		
“attitude towards usage “of Digital Wearable Device (ATU)	.682**	.723**	1	
Behavioral intention to use the Digital Wearable Device (BIU)	.862**	.721**	.709**	1

** . Correlation is significant at the 0.01 level (2-tailed).

Regression analysis

Regression analysis is used to understand which of the independent variables are related to the dependent variable. In restricted circumstances, regression analysis can be used to infer causal relationships between the independent and dependent variables. In this study, we examine the relationships among “perceived usefulness “, “perceived ease of use”, attitude to use, and intention to use. We also explored the forms of these relationships.

In the testing of goodness of fit, the “perceived usefulness “ of Digital Wearable Device would be able to elucidate the R² value of 0.4619 of “perceived usefulness “, which had the capability of explanation of 46.1%, and the p-value 0.000 was less than 0.05, which reached the significance level, and the t value was positive, indicating that the “perceived usefulness “ was significantly and proportionally affected by the “attitude towards usage “of Digital Wearable Device (ATU).

The beta coefficient is 0.682, which means that when increasing the “perceived ease of use” by one unit, the “perceived usefulness “ will increase by 0.682 units. The statistical significance of the estimated parameters is shown as below

Table: 1 Independent Variable (“perceived usefulness “ of Digital Wearable Device (PU)) and dependent variable (“attitude towards usage “of Digital Wearable Device (ATU))

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.682 ^a	.466	.461	2.03909	.466	91.510	1	105	.000

a. Predictors: (Constant), Perceived Use

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.183	1.138		4.554	.000
	Perceived Use	.663	.069	.682	9.566	.000

a. Dependent Variable: Attitude Use

In the testing of goodness of fit, the “perceived ease of use” of Digital Wearable Device would be able to elucidate the R² value of 0.519 of “perceived usefulness “, which had the capability of explanation of 51.9%, and the p-value 0.000 was less than 0.05, which reached the significance level, and the t value was positive, indicating that the “perceived usefulness “ was significantly and proportionally affected by the “attitude towards usage “of Digital Wearable Device (ATU).

The beta coefficient is 0.723, which means that when increasing the “perceived ease of use” by one unit, the “attitude towards usage “of Digital Wearable Device will increase by 0.723 units. The statistical significance of the estimated parameters is shown as below

Regression Table: 2 Independent Variable (“perceived ease of use” of Digital Wearable Device (PEOU)) and dependent variable (“attitude towards usage “of Digital Wearable

Device (ATU))

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.723 ^a	.523	.519	1.92591	.523	115.284	1	105	.000

a. Predictors: (Constant), Percieved Ease of USe

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.107	1.299		1.623	.108
	Percieved Ease of USe	.982	.091	.723	10.737	.000

a. Dependent Variable: Attitude Use

In the testing of goodness of fit, the “perceived ease of use” of Digital Wearable Device would be able to elucidate the R² value of 0.574 of “perceived usefulness”, which had the capability of explanation of 57.4%, and the p-value 0.000 was less than 0.05, which reached the significance level, and the t value was positive, indicating that the “perceived usefulness” was significantly and proportionally affected by the “attitude towards usage” of “perceived usefulness” of Digital Wearable Device.

The beta coefficient is 0.760, which means that when increasing the “perceived ease of use” by one unit, the “perceived usefulness” of Digital Wearable Device will increase by 0.760 units. The statistical significance of the estimated parameters is shown as below

Regression Table: 3 Independent Variable (“perceived ease of use” of Digital Wearable Device (PEOU)) and dependent variable (“perceived usefulness” of Digital Wearable Device (PU))

Model Summary

Model	R				Change Statistics
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		R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.760 ^a	.578	.574	1.86438	.578	143.847	1	105	.000

a. Predictors: (Constant), Perceived Ease of use

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.246	1.257		.991	.324
	Perceived Ease of use	1.062	.089	.760	11.994	.000

a. Dependent Variable: Perceived Use

In the testing of goodness of fit, the Behavioral intention to use the Digital Wearable Device would be able to elucidate the R² value of 0.498 of “perceived usefulness”, which had the capability of explanation of 49.8%, and the p-value 0.000 was less than 0.05, which reached the significance level, and the t value was positive, indicating that the “perceived usefulness” was significantly and proportionally affected by the “attitude towards usage” of “attitude towards usage” of Digital Wearable Device.

The beta coefficient is 0.709, which means that when increasing the “perceived ease of use” by one unit, the “attitude towards usage” of Digital Wearable Device will increase by 0.709 units. The statistical significance of the estimated parameters is shown as below

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.709 ^a	.503	.498	1.72509	.503	106.234	1	105	.000

a. Predictors: (Constant), Attitude Use

Regression Table: 4 Independent Variable (“attitude towards usage” of Digital Wearable Device (ATU)) and dependent variable (Behavioral intention to use the Digital Wearable

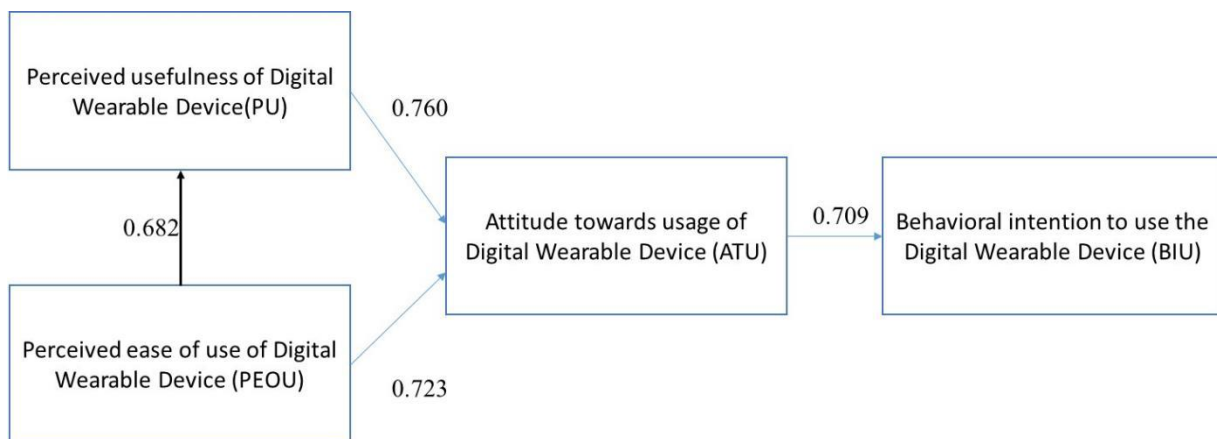
Device (BIU))

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant) Attitude Use	6.330	.974		6.497	.000
	.622	.060	.709	10.307	.000

a. Dependent Variable: Intention to Use

Research Results



Limitations of Research

- 1) The major limitation of this research is difficult to find out the respondents those who are using this digital wearable.
- 2) Most modern issues related to wearable data processing, privacy, security and transmission aspects localization and communication followed by adoption, hardware constraints, inter-functionality and scalability aspects.
- 3) It has been reported that some wearable occasionally miscalculate data. This can be especially dangerous when measuring data like heart rates. For people with a heart condition, this misreading can lead to more fatigue and health problems.

Future scope of Research

- 1) After this research we have been able to find out the “perceived usefulness” (PU), “perceived ease of use” (PEOU), “attitude towards usage” (ATU) and “behavioral intention to use digital technology” (BIU). “perceived usefulness” (PU) and the intention of purchase of digital wearable. In future research can be done on the people with health problems and how this digital wearable can give timely suggestion or alert on various health issues so that they have better enhance their life.
- 2) How to create awareness towards the digital wearable.
- 3) Features Offered by the digital wearable and actual customer demand with related to TAM model

Conclusion:

This research has been executed to find out the relationship between PEOU, PU, ATU towards usage of digital wearable devices. Results showed that the respondents are highly intended to use the digital wearable devices in their professional activities. The respondent also believes that the digital wearable devices will improve their knowledge and make day to day life much easier. The results demonstrate that the revised TAM model proposed in this study supports all the hypotheses of digital wearable device usage behavior. The results of this study provide evidence for the importance of variables to TAM in considering “perceived usefulness”, “perceived ease of use”, attitude and behavioral intention to use digital wearable devices.

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