

Consumer Adoption of Self-Service Technologies: Integrating the Behavioral Perspective with the Technology Acceptance Model

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Abstract

Recent technological advancements have had a substantial impact on consumer buying behavior. This research aims to determine the factors affecting consumer behavior related to the adoption of self-service technologies (SSTs). The intended findings of this study are expected to contribute to understanding consumer behavior towards the adoption of SSTs taking into account the logic of two main theories in this regard: the Technology Acceptance Model (TAM) and the assumptions of the Behavioral Perspective Model (BPM). This research follows a triangulation approach. Consequently, a number of semi structured interviews were conducted with experts and executive directors from selected SSTs providers in Jordan. In addition, the convenience sampling technique was employed focusing on current (or) previous users of SSTs in the public and private sectors in Jordan using a self-administrative questionnaire (66% response rate). The results confirmed the influence (direct and indirect) of previous experience and personal initiatives and characteristics on consumer intention to use SSTs. In addition, the results indicated the important role of the mediator variables namely: perceived ease of use (EOU), perceived risk (PR), and perceived usefulness (PU) on consumer attitude towards SSTs which in turn will positively affect consumer intention to use SSTs.

Keywords: Self-Service Technologies (SSTs), Technology Acceptance Model (TAM), Behavioral Perspective Model (BPM), Intention to Use

JEL Classification Code: M15, M31, D19

1. Introduction

Thus, the importance of this research stems from the integration of two areas of research: consumer behavior and management information systems. Also, it is a consideration of keeping pace with the growing trend in the adoption of the new generations of technology-based services based on the accelerated growth of new technologies, information systems and communication.

2. Literature Review

In today's digital age, information technology (IT) has dramatically changed everyday life. Advances in information and communication technologies (ICT) in recent years have stimulated the increasing interest in consumer technology adoption (Khan et al., 2020; Byun, 2018; Baron et al., 2006) which in turn have contributed to inventing more and more in SSTs.

As a literature review research, the study of Hanafizadeh et al. (2017) reviewed 81 research articles published between 1996 and 2013 on the impact of information technology on lifestyle. The findings of this research contributed in developing an eight-sided lifestyle model including health, learning, social, work and environment, energy, art, etc. The study conducted by Hamid and Khatibi (2006), was aimed at exploring the roles of perceived risk (PR) in determining the types of online activities which consumers prefer. This study was criticized as the respondents were mainly well educated and above 30 years of age. Based on the logic of TAM, Byun's (2018) study examined the effect of personal product knowledge on consumer attitude presented by perceived

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usefulness (PU) and ease of use (EOU). Byun concluded that respondents should have minimum level of knowledge of the target system in order to form accurate beliefs and behavioral decisions.

While Gaile-Sarkane (2009) concluded that IT created dynamic behavior which involves different interactions and exchanges from the traditional market, the study of Viljoen et al. (2005) highlighted the implementations of IT in customer relationship management (CRM) strategy. The study was focused on the technological developments and its applications in the CRM context. In the same context, Gubser (2001), pointed out some of the interactive technologies that provide interactive customer communications, namely: intelligent email, collaborative chat, self-help, telephony, Voice over Internet Protocol (VoIP). Moreover, the main contribution of the study conducted by Cavalcante (2013) is its use of the business model perspective to analyze the impact of an emergent technology on companies' innovation activities.

To conclude, while many previous studies paid more attention towards technology adoption and explored the variables that may help to increase the rate of the adoption of innovation and technology, this research is aimed at building an in-depth understanding of the factors influencing Jordanian consumer behavior towards the adoption of SSTs taking into account both the TAM model and consumer behavior and psychological aspects (BPM model).

3. Methodology

The nature of the present research focuses mainly on understanding consumer behavior of individuals. Research difficulties were expected with regard to identifying the underlying drivers that affect the individuals' buying behavior. Consequently, this research used 'triangulation' as a preferred methodological approach that helps in overcoming constraints facing researchers within service markets based on high technology (Ashour, 2018).

Triangulation as a methodological technique refers to the use of multi-method approach in which different investigative methods are applied to the same phenomenon (Kern, 2018; Burton & Mazerolle, 2011; Erzberger & Prein, 1997) in order to pinpoint the phenomenon, to improve the accuracy of the observations (Mason, 2006) and to facilitate validation of collected data (Bogdan & Biklen, 2006).

In this study, two types of triangulation were adopted. Theory triangulation was used which involved using more than one theoretical position in the interpretation of the phenomenon, and the methodological triangulation was also used which enabled the use of more than one method for gathering data ,interviews, questionnaires, documents, etc. (Denzin, 1978).

As a preliminary stage, the researchers used the semi-structure interview as an important data collection tool. A series of ten interviews were conducted with executive directors, supervisors and experts from different government and private related departments in Jordan to verify the validity of the developed research model.

It is worth noting that the interviews conducted with the experts and managers from the selected SSTs providers in Jordan were accomplished taking into account the main dimensions of the BPM. Thus, the interview questions were formulated to explore the extent to which consumer behavior of SSTs is: (1) learning history, (2) a utilitarian reinforcement behavior, (3) utilitarian punishment behavior, (4) informational reinforcement behavior, and (5) informational punishment behavior (Foxall & Greenley, 2000; Foxall, 1996).

The present research model has taken into account the perspectives of both managers and customers. Also, in addition to the semi-structure interview technique which was adopted in the preliminary stage, this study used a questionnaire aimed at evaluating the effects of the TAM related factors on consumers adoption of SSTs: PU, perceived EOU (Davis, 1989), PR (Sanayei & Bahmani, 2012), previous experience, personal initiatives and characteristics (Gao et al., 2008; Tracy, 2000).

According to the research methodology, a sample will be chosen to represent the two points of view, the managers and consumers, separately. Then the data will be analyzed according to the advanced and appropriate statistical methods, taking into consideration the conduct of comparative tests of the results based on the views of different sources of data: managers perspective vs. consumers perspective, and then the researchers will measure the gap between departmental evaluations in the public and private sectors, and actual consumer assessments in the Jordanian market.

4. Data Analysis and Results

Before conducting the test of the study hypotheses, some of the properties of data represented by sampling adequacy and multicollinearity between the relevant variables were verified. These are as follows:

4.1. Test the Sampling Adequacy Property and VIF Problem

The results of testing sampling adequacy property, related to verifying that the data are sufficient for purposes of the statistical analysis, by using the Kaiser-Meyer-Olkin (KMO) test indicated that, an appropriate sampling method was applied and sufficient data of the study variables were selected for the purposes of statistical analysis. This is supported by the value of the test criterion KMO of 0.828,

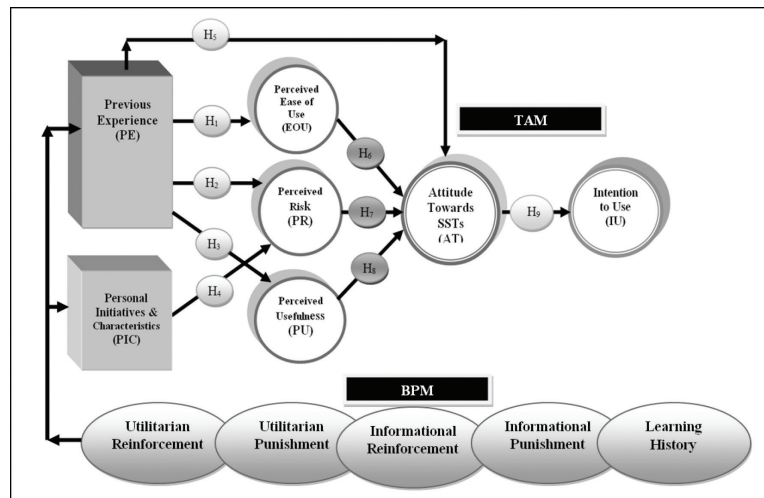


Figure 1: Research Theoretical Framework

which is greater than half 0.5 In addition, the results of the variance inflation factors (VIF) test related to verifying the existence of a problem of, multicollinearity between the independent variables from its absence showed that there is no multicollinearity problem between the independent variables. This is supported by the values of the VIF test calculated for the independent variables which ranged from 1.355 to 2.083, where all values are less than the critical value of test 10.

4.2. Results

4.2.1. Testing the Impact of PE on EOU, PU and PR

To test the validity of the following research hypotheses, (H1), (H2), (H3), and (H4), a simple linear regression analysis was used.

H1: There is no statistically significant impact for the previous experience (PE) on perceived ease of use (EOU) dimension as a mediator variable [at an alpha level of 0.05 ($\alpha = 0.05$)].

H2: There is no statistically significant impact for the previous experience (PE) on perceived risk (PR) dimension as a mediator variable [at an alpha level of 0.05 ($\alpha = 0.05$)].

H3: There is no statistically significant impact for the previous experience (PE) on perceived usefulness (PU) dimension as a mediator variable [at an alpha level of 0.05 ($\alpha = 0.05$)].

H4: There is no a statistically significant impact for the personal characteristics on perceived risk (PR) dimension as a mediator variable [at an alpha level of 0.05 ($\alpha = 0.05$)].

The above table shows the results of the analysis:

1. Proving the validity of the simple linear regression model, this is supported by the calculated values of (F) (92.818, 35.184, 44.984, 5.360) respectively which were greater than the tabular value of (F) (3.84), and the significance of ($F = 0.022$) is less than the significance level ($\alpha = 0.05$).
2. The values of the determination coefficient (R^2) (0.364, 0.178, 0.217, 0.032) indicate the changes that occur in independent variables PE and PIC, and to which extent, the ratios that it explains the changes occur that in the independent variables EOU, PU and PR.
3. Proving the significance of the regression coefficient (b) for the independent variables in the 4 hypotheses. This is supported by values of (t) (9.634, 5.932, 6.707, 2.315), which are greater than the tabular value of ($t = 1.96$), and the significance of (t) ranged from 0.000 to 0.022 which is less than the significance level ($\alpha = 0.05$). Therefore:
 - The null hypothesis (H1) was rejected, and the alternative hypothesis (H11) was accepted, which states: There exists a statistically significant impact at the significance level ($\alpha = 0.05$), for the PE on perceived EOU dimension as a mediator variable.
 - The null hypothesis (H2) was rejected, and the alternative hypothesis (H12) was accepted, which states: There exists a statistically significant impact at the significance level ($\alpha = 0.05$), for the PE on PR dimension as a mediator variable.

Table 1: Results of Testing the Impact of PE on EOU, PU and PR as Mediator Variables. And Testing the Impact of PIC on PR as a Mediator Variable

(H)	Independent Variable	Coefficient (β_i)	Std. Errors	T-Statistic	p-value
(H1)	Constant (β_0)	1.397	0.264	5.289	0.000
	Previous experience	0.621	0.064	9.634*	0.000
Correlation coefficient (R) = 0.604			Determination Coefficient (R^2) = 0.364		
F-test = 92.818			Sig. of (F) = 0.000		
(H2)	Constant (β_0)	2.287	0.299	7.652	0.000
	Previous experience	0.433	0.073	5.932*	0.000
Correlation coefficient (R) = 0.422			Determination Coefficient (R^2) = 0.178		
F-test = 35.184			Sig. of (F) = 0.000		
(H3)	Constant (β_0)	2.390	0.245	9.747	0.000
	Previous experience	0.402	0.060	6.707*	0.000
Correlation coefficient (R) = 0.466			Determination Coefficient (R^2) = 0.217		
F-test = 44.984			Sig. of (F) = 0.000		
(H4)	Constant (β_0)	3.340	0.305	10.966	0.000
	Personal characteristics	0.176	0.076	2.315*	0.022
Correlation coefficient (R) = 0.179			Determination Coefficient (R^2) = 0.032		
F-test = 5.360			Sig. of (F) = 0.022		

The tabular value of (t) with (df. = 162), at the significance level ($\alpha = 0.05$) = 1.96.

The tabular value of (F) with two df. (162, 1), at the significance level ($\alpha = 0.05$) = 3.84.

- The null hypothesis (H3) was rejected, and the alternative hypothesis (H13) was accepted, which states:
- The null hypothesis (H4) was rejected, and the alternative hypothesis (H14) was accepted, which states: There exists a statistically significant impact at the significance level ($\alpha = 0.05$), for the personal characteristics (PIC) on PR dimension as a mediator variable.

1.2.2. Testing the Impact of Previous Experience on (Attitude towards SSTs) Variable (H5)

H5: *There is no statistically significant impact for the previous experience on (attitude towards SSTs) variable [at an alpha level of 0.05 ($\alpha = 0.05$)].*

To test the validity of the above hypothesis, a simple linear regression analysis was used. The following Table 2, shows the results of the analysis:

We note from the results listed in Table 2, the following:

1. Proving the validity of the simple linear regression model, this is supported by the calculated value of ($F = 51.476$), which is greater than the tabular value

of (F) of (3.84), and the significance of ($F = 0.000$) is less than the significance level ($\alpha = 0.05$).

2. The value of the determination coefficient ($R^2 = 0.241$) indicates that the change that occurs in PE variable explains (24.1%) of the changes that occur in attitude towards SSTs.
3. Proving the significance of the regression coefficient (b) for the PE variable. This is supported by value of ($t = 7.175$), which is greater than the tabular value of ($t = 1.96$), and the significance of ($t = 0.000$) is less than the significance level ($\alpha = 0.05$). Therefore, the null hypothesis (H5) was rejected, and the alternative hypothesis (H15) was accepted, which states: There exists a statistically significant impact at the significance level ($\alpha = 0.05$), for the PE on attitude towards SSTs variable.

4.2.3. Testing Research Hypotheses (H6), (H7) and (H8)

To test the validity of the following research hypotheses, the Path Analysis method available in the analysis of a moment structures (AMOS) application was used. As shown in Table 3.

H6: *There is no statistically significant impact for the previous experience (PE) on the attitude (AT) variable*

Table 2: Results of Testing the Impact of PE on Attitude Towards SSTs Variable

Independent Variable	Coefficient (β)	Std. Errors	T-Statistic	p-value
Constant (β_0)	2.020	0.283	7.143	0.000
Previous experience	0.495	0.069	7.175*	0.000
Correlation coefficient (R) = 0.491		Determination Coefficient (R^2) = 0.241		
F-test = 51.476		Sig. of (F) = 0.000		

The tabular value of (t) with (df. = 162), at the significance level ($\alpha = 0.05$) = 1.96.

The tabular value of (F) with two df. (162, 1), at the significance level ($\alpha = 0.05$) = 3.84.

Table 3: Results of Path Analysis, to Test the Impact of (PE) on (AT) through the (EOU), (PR) and (PU) as Mediator Variables

	Study Variables	Coefficients (β)	Std. Errors	T-Statistic	p-value	Type of Effect
H6	Results of Path analysis, to test the impact of previous experience (PE) on the attitude (AT) variable through the perceived ease of use (EOU) as a Mediator variable.					
	PE \rightarrow EOU	0.621	0.064	9.634**	0.000	Direct effect
	EOU \rightarrow AT	0.428	0.069	6.183**	0.000	Direct effect
	PE \rightarrow AT	0.495	0.069	7.175**	0.000	Indirect effect
H7	Results of Path analysis, to test the impact of previous experience (PE) on the attitude (AT) variable through the perceived risk (PR) as a Mediator variable.					
	PE \rightarrow PR	0.433	0.073	5.932**	0.000	Direct effect
	PR \rightarrow AT	0.265	0.074	3.563**	0.000	Direct effect
	PE \rightarrow AT	0.495	0.069	7.175**	0.000	Indirect effect
H8	Results of Path analysis, to test the impact of previous experience (PE) on the attitude (AT) variable through the perceived usefulness (PU) as a Mediator variable.					
	PE \rightarrow PU	0.402	0.060	6.707**	0.000	Direct effect
	PU \rightarrow AT	0.546	0.081	6.715**	0.000	Direct effect
	PE \rightarrow AT	0.495	0.069	7.175**	0.000	Indirect effect

through the perceived ease of use (EOU) as a mediator variable [at an alpha level of 0.05 ($\alpha = 0.05$)].

H7: There is no statistically significant impact for the previous experience (PE) on the attitude (AT) variable through perceived risk (PR) as a mediator variable [at an alpha level of 0.05 ($\alpha = 0.05$)].

H8: There is no statistically significant impact for the previous experience (PE) on the attitude (AT) variable through perceived usefulness (PU) as a mediator variable [at an alpha level of 0.05 ($\alpha = 0.05$)].

4.2.3.1. Results of Testing the Hypothesis of Perceived Ease of Use (EOU) Variable as a Mediator Variable (H6)

To test the validity of the above hypothesis, the Path Analysis method available in the AMOS application was used. As shown in Table 3.

We note through the results listed in Table 3, proving the significance of the regression coefficient (β) of PE variable related to a direct effect on perceived EOU as a mediator variable. This is supported by the calculated value ($t = 9.634$), and the significance of (t) is less than the significance level ($\alpha = 0.05$). Therefore, there exists a statistically significant direct impact at the mentioned significance level for the PE variable on perceived EOU as a mediator variable. In light of this, the null hypothesis (H6) was rejected, and the alternative hypothesis (H16) was accepted, which states: There exists a statistically significant direct impact at the significance level ($\alpha = 0.05$), for the PE variable on the AT variable through the perceived EOU as a mediator variable.

Also, proving the significance of the regression coefficient (β) of the perceived EOU as a mediator variable, related to the direct impact on the AT variable). This is supported by the calculated value ($t = 6.183$), as well as the significance (t)

of the mentioned variable is less than the significance level ($\alpha = 0.05$). Therefore, there exists a statistically significant direct impact at the significance level ($\alpha = 0.05$) for the perceived EOU as a mediator variable on the AT variable.

On the other hand, the results of Table 3 prove the regression coefficient (β) of the PE variable which is related to the indirect impact on the AT variable. This is supported by the calculated value ($t = 7.175$), and the significance of (t) is less than the significance level ($\alpha = 0.05$). Therefore, there exists a statistically significant indirect impact at the significance level ($\alpha = 0.05$), for the PE variable on the AT variable.

In light of this, the null hypothesis (H6) was rejected, and the alternative hypothesis (H16) was accepted, which states: There exists a statistically significant indirect impact at the significance level ($\alpha = 0.05$), for the PE variable on the AT variable through the perceived EOU as a mediator variable.

4.2.3.2. Results of Testing the Hypothesis of Perceived Risk (PR) Variable as a Mediator Variable (H7)

To test the validity of the above hypothesis, the Path Analysis method available in the AMOS application was used. As shown in Table 3, as follows:

We note through the results listed in Table 3, proving the significance of the regression coefficient (β) of PE variable related to a direct effect on PR as a mediator variable. This is supported by the calculated value ($t = 5.932$), and the significance of (t) is less than the significance level ($\alpha = 0.05$). Therefore, there exists a statistically significant direct impact at the mentioned significance level for the PE variable on PR as a mediator variable. In light of this, the null hypothesis (H7) was rejected, and the alternative hypothesis (H17) was accepted, which states: There exists a statistically significant direct impact at the significance level ($\alpha = 0.05$), for the PE variable on the AT variable through the PR as a mediator variable.

Also, proving the significance of the regression coefficient (β) of the PR as a mediator variable, related to the direct impact on the AT variable. This is supported by the calculated value ($t = 3.563$), as well as the significance (t) of the mentioned variable is less than the significance level ($\alpha = 0.05$). Therefore, there exists a statistically significant direct impact at the significance level ($\alpha = 0.05$) for the PR as a mediator variable on the AT variable.

In addition, the above results shown in Table 3, prove the regression coefficient (β) of the PE variable, which is related to the indirect impact on the AT variable. This is supported by the calculated value ($t = 7.175$), and the significance of (t) is less than the significance level ($\alpha = 0.05$). Therefore, there exists a statistically significant indirect impact at the significance level ($\alpha = 0.05$), for the PE variable on the AT variable. In light of this, the null hypothesis (H7) was

rejected, and the alternative hypothesis (H17) was accepted, which states: There exists a statistically significant indirect impact at the significance level ($\alpha = 0.05$), for the PE variable on the AT variable through the PR as a mediator variable.

4.2.3.3. Results of Testing the Hypothesis of Perceived Usefulness (PU) Variable as a Mediator Variable (H8)

To test the validity of the above hypothesis, the Path Analysis method available in the AMOS application was used. As shown in the above Table 3, proving the significance of the regression coefficient (β) of PE variable related to a direct effect on PU as a mediator variable. This is supported by the calculated value ($t = 6.707$), and the significance of (t) is less than the significance level ($\alpha = 0.05$). Therefore, there exists a statistically significant direct impact at the mentioned significance level for the PE variable on PU as a mediator variable. In light of this, the null hypothesis (H8) was rejected, and the alternative hypothesis (H18) was accepted, which states: There exists a statistically significant direct impact at the significance level ($\alpha = 0.05$), for the PE variable on the AT variable through the PU as a mediator variable.

Also, proving the significance of the regression coefficient (β) of the PU as a mediator variable, related to the direct impact on the AT variable. This is supported by the calculated value ($t = 6.715$), as well as the significance (t) of the mentioned variable that is less than the significance level ($\alpha = 0.05$). Therefore, there exists a statistically significant direct impact at the significance level ($\alpha = 0.05$) for the PU as a mediator variable on the AT variable.

On the other hand, it is evident from the results of Table 3 the regression coefficient (β) of the PE variable, is related to the indirect impact on the AT variable. This is supported by the calculated value ($t = 7.175$), and the significance of (t) that is less than the significance level ($\alpha = 0.05$). Therefore, there exists a statistically significant indirect impact at the significance level ($\alpha = 0.05$), for the PE variable on the AT variable. In light of this, the null hypothesis (H8) was rejected, and the alternative hypothesis (H18) was accepted, which states: There exists a statistically significant indirect impact at the significance level ($\alpha = 0.05$), for the PE variable on the AT variable through the PU as a mediator variable.

After the completion of testing the hypothesis (H6), (H7) and (H8), the total direct and indirect effects for the PE variable was evaluated. The results listed in Table 4, explain that:

The results listed in Table 4, indicate that there exists a statistically significant impact at the significance level ($\alpha = 0.05$), for the PE on the AT variable through the perceived EOU, PR and PU as mediator variables.

4.2.4. Testing the Impact of Attitude Towards SSTs on Intention to Use (IU) Variable (H9)

H9: *There is no statistically significant impact for the attitude towards SSTs on intention to use variable [at an alpha level of 0.05 ($\alpha = 0.05$)].*

To test the validity of the above hypothesis, a simple linear regression analysis was used. The following Table 5, shows the results of the analysis:

We note from the results listed in Table 5, the following:

1. Proving the validity of the simple linear regression model, this is supported by the calculated value of ($F = 41.095$), which is greater than the tabular value of (F) of (3.84), and the significance of ($F = 0.000$) is less than the significance level ($\alpha = 0.05$).
2. The value of the determination coefficient ($R^2 = 0.202$) indicates that the change that occurs in attitude towards SSTs variable explains (20.2%) of the changes that occur in IU.
3. Proving the significance of the regression coefficient (b) for the attitude towards SSTs variable.

This is supported by the value of ($t = 6.411$), which is greater than the tabular value of ($t = 1.96$), and the significance of ($t = 0.000$) is less than the significance level ($\alpha = 0.05$). Therefore, the null hypothesis (H9) was rejected, and the alternative hypothesis (H19) was accepted, which states: There exists a statistically significant impact at the significance level ($\alpha = 0.05$), for the attitude towards SSTs on IU.

5. Discussion and Conclusions

This research used a theoretical framework which was developed based on the assumptions of both the BPM and the TAM for the purpose of gaining an in-depth understanding of the factors that shape consumer behavior towards the adoption and use of SSTs. Accordingly, this study underlines the link between the antecedents and mediator factors, and the IU the SSTs.

A thorough assessment of the direct and indirect effect of PE and personal initiatives and characteristics on consumer intention to use SSTs was done. This research investigated the mechanisms by which consumers' AT toward SSTs is formed and which in turn will result in the achievement of IU.

Table 4: Results of Total of the Direct and Indirect Effects for (H6), (H7) and (H8)

H6	Independent Variable	Regression Coefficients		Total of the Direct and Indirect Effects	Decision	Result
		(EOU)	Attitude (AT)			
	Previous experience (PE)	0.621	0.495	1.116	Reject H6	There exists a significant impact
H7	Independent Variable	Regression Coefficients		Total of the Direct and Indirect Effects	Reject H7	There exists a significant impact
		(PR)	Attitude (AT)			
	Previous experience (PE)	0.433	0.495	0.928		
H8	Independent Variable	Regression Coefficients		Total of the Direct and Indirect Effects	Reject H7	There exists a significant impact
		(PU)	Attitude (AT)			
	(PE)	0.879	0.495	0.928		

Table 5: Results of Testing the Impact of Attitude towards SSTs on Intention to use Variable

Dependent Variable	Coefficient (β)	Std. Errors	T-Statistic	p-value
Constant (β_0)	2.556	0.235	10.852	0.000
Attitude towards SSTs	0.370	0.058	6.411*	0.000
Correlation coefficient (R) = 0.450		Determination Coefficient (R^2) = 0.202		
F-test = 41.095		Sig. of (F) = 0.000		

The tabular value of (t) with (df. = 162), at the significance level ($\alpha = 0.05$) = 1.96.

The tabular value of (F) with two df. (162, 1), at the significance level ($\alpha = 0.05$) = 3.84.

Our study reveals the important role of the mediator variables namely: perceived EOU, PR and PU in relation to the AT of SSTs and IU it. This result is consistent with Hamid and Khatibi (2006), findings which show that the levels of technology based products and services adoption is affected by consumers experience and PR. In addition, it concurs with Rattanaburi and Vongurai (2020), research that pointed out the positive effect of PU, personal innovativeness and compatibility on behavioral intention.

The finding supports the outcome of Alalwan et al. (2014) who highlighted that trust, which depends on previous experience, is the most influential factor predicting customers' intention and adoption of internet banking.

While Hanafizadeh et al. (2017) indicated the negative impact of information technology on some social behavior and individual life styles, this research concurs with results of the study conducted by Gaile-Sarkane (2009) which concluded that information technologies create dynamic behavior which is changing under the impact of new technologies.

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