Modeling the Customer's Adaptive Behavior towards Accepting the Technological Change in E-Banking Services: The Moderation Role of Service Accessibility

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Abstract

This study aimed to investigate the moderation role of technology accessibility (ACC) in the relationship between Performance expectancy (PE), Effort expectancy (EE), Social influence (SI), and Facilitating conditions (FC)as a predictor variables and behavioral intention (BI) to adapt with the technological change on the e-banking services.

A sample of 545 users of e-banking services collected randomly from Sohag, Qina, Luxor, and Aswan cities in Egypt. The authors relied on (Goularte and Zilber 2019; Lichtenstein and Williamson 2006; Paim, Delafrooz, and Taleghani 2014) to measure the study variables.

The study findings referred to a significant relationsp between the customer's adaptive behavior dimensions and accepting the technological change. Only the facilitating conditions –as one of these dimentions- have no effect on the adapting behavior. The findings ,also, supported the moderating role of ACC in affecting the model interpretation for the customers' BI.

This study aimed to integrate ACC as one of 4A's e-banking with the UTAUT on users of e-banking services. The results of the study may help guide the banking mangers in Egypt for improving the level of e-services quality and the readiness to adopt the technological changes of their customers.

Keywords: UTAUT, E-banking, accessibility, performance expectancy, effort expectancy, social influence, facilitating conditions, behavioral intention, and adaptive behavior

1. Introduction

Technological change poses increased threats to business stability and industrial institutions. Yet, this change offers competitive opportunities to provide new services to customers. With the fast technological change, customers' acceptance of technology depends on factors such as availability of technology, customer need, safety, ease of use and convenience (Lai, 2017).

Increased individual and business banking activities created a general trend toward shifting to nontraditional banking services. With the effective use of IT in many institutions, bank's managers seek to use this technology to provide banking services to the customer electronically in so-called e-banking Services.

E-banking activities could provide faster and lower costs of banking services (Hamill & Gregory, 1997). In conjunction with the changing technological environment, there is usually a constant change in e-banking activities (Poon, 2007). On the other hand, bank managers need to understand the customers' responsiveness and acceptance of e-banking services. Several researches have been addressed the conceptual frameworks and models which can be used to measure and interpret the customer adaptation with the changes in e-banking activities. Furthermore, many models have been presented from the theory of reasoned action (TRA) (Fishbein and Ajzen 1975), through the technology acceptance model (TAM) (Davis 1989; Davis, et al. 1989), to the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al. 2003). .

Yet, few studies have investigated the impact of marketing stimuli as a moderator role in increasing the UTAUT outcomes of. So, this research aims to investigate the moderation role of service accessibility (ACC) as one of the 4A's marketing mix in increasing the UTAUT's outcomes in predicting the customer's adaptive behavior toward technological change in e-banking services.

1.1 Theoretical Background and Hypotheses

1.1.1 The Theory of Reasoned Action (TRA)

TRA was developed in the late 1960s by Martin Fishbein. Another development of this theory has been conducted in the mid-1970s by Fishbein and Ajzen (1975), which was one of the most important contribution to explain consumer behavior (Sheppard et al., 1988). The theory can be used to predict the consumer intentions and providing a simplified basis for understanding how consumer behavior is changed (Coleman et al., 2011; Hansen et al., 2004; Lada et al., 2009; Sheppard et al., 1988). The main assumption of the TRA is the existence of a strong connection between behavioral intention (BI) and individual behavior (IB), while the individual behavior can be predicted strongly by the behavioral intention. According to the theory, the behavioral intentions is a result of the individual's attitudes and Subjective Norm (Ajzen et al., 2007; Fishbein & Ajzen, 1975; Hale et al., 2002; Lai, 2017). TRA can be expressed in the following equation:

$$BI = (AB)W1 + (SN)W2$$

Fishbein and Ajzen (1975) explained that the individual's BI has a great impacts on shaping the individual's actual behavior, while individual's BI is strongly influenced by the individual's attitudes and subjective norms (SN). The following figure illustrates the TRA:
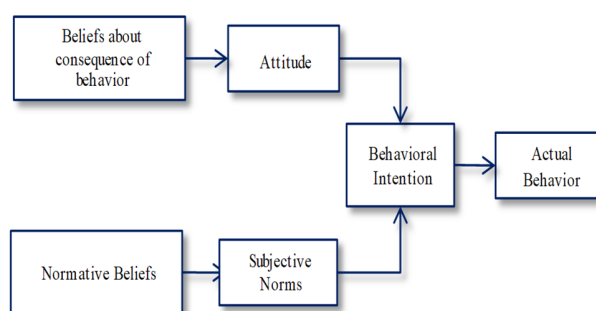

Figure 1. The Theory of reasoned action (TRA)

Source. Fishbein and Ajzen, (1975).

One of the TRA's limitations is that it can predict as low as 24.2% of the variance in behavioral intention (Parker et al., 1992). Whereas Jon and Wang (2009) pointed out that Fishbein and Ajzen avoided the social influence in predicting the behavioral intention. Sheppard et al. (1988) referred that better explanations will be given if goal intentions, choice situations, and differences between intention and estimation measures included to the model.

1.1.2 Theory of Planned Behavior (TPB)

Ajzen (1991) developed TPB, which provided an explanation of the relationship between individual's *Intention* and individual's *Attitude* with individual behavior as shown in Figure 2. Both Ajzen (1991) and Montaño & Kasprzyk (2008) suggested that the TPB is an extension of TRA. Where both theories focused on the theoretical constants related to the motivational factors of individuals as determinants of the probability of performing certain behavior (Albarracin et al. 2001; Godin 1993; Madden et al. 1992; Montaño and Kasprzyk 2008), where BI is the best indicator of individual behavior (Montaño & Kasprzyk, 2008). One of the contributions offered by this theory is that it provides better prediction for the variance in the BI than TRA, where R^2 increased from 24.2% to 31.7% after adding the perceived behavioral control (Parker et al., 1992).
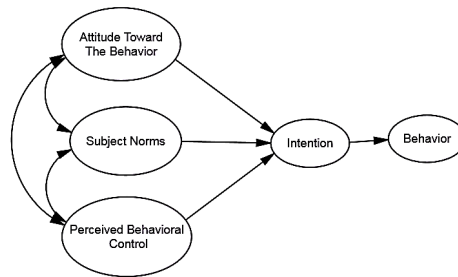
Figure 2. Theory of planned behavior (TPB)

Overall, TPB provided three variables explained from 31.7% to 40% of the variance in behavioral intention (Parker et al., 1992; Teo & Beng Lee, 2010). Although of is its ability to handle the personal factors, TPB still avoids the external and social factors the same as TRA.

1.1.3 Technology Acceptance Model (TAM)

Focusing on the individual behavior regarding the use of technology has been addressed by the TAM which developed by Davis (1989) and Davis et al., (1989). The major contribution of TAM is the ability to predict the customers' acceptance of using technology by measuring their intention. That intention could be predicted by measuring the users' attitudes, subjective norms, perceived usefulness, and perceived ease of use, as shown in Figure 3. TRA was the root by which the TAM was developed and used to explain individual attitude toward using technology (Davis et al., 1989).
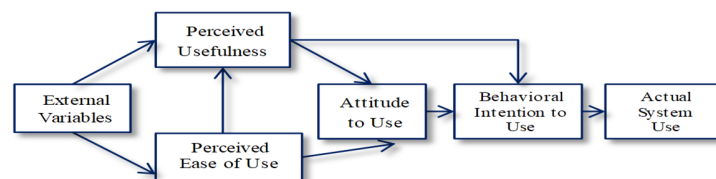

Figure 3. Technology acceptance model

Source. Davis (1989); Davis et al. (1989).

TAM's theory was the first and the most widely used by researchers to predict acceptance of technology (Indrati et al. 2011; Jong and Wang 2009), beside that the incredible effect on empirical research (Bagozzi, 2018).

Aside of that, There are a set of limitations which represent in TAM's explanatory power (R^2) (Bagozzi 2018; Lai 2017), whereas TAM's R^2 has been accounted for 15% - 57% in predicting the variance in the 'intention to use' (Al-Gahtani et al., 2007; Davis et al. 1989; Jong and Wang 2009; Ong et al., 2004). So, Davis (1989); Hu et al. (2012) recommended that future researches should be done for more explanation to the variables which interpret the acceptance to use technology.

On the other hand, Venkatesh and Davis (2000) provided a theoretical extension for the first model of technological acceptance (TAM) through developing the second model of technological acceptance (TAM2). Venkatesh and Davis (2000) provided more explanation for the external factors. These factors contribute to increasing the explanatory power for predicting user's behavior in accepting technology. This model could identify approximately 60% of factors that affect the user's intention to use the system. These factors are likely having social impact such as subjective norms, voluntariness, and image. In addition to the system knowledge factors, which represented in job relevance, output quality, result demonstrability, ease of use and perceived usefulness, as shown in Figure 4.
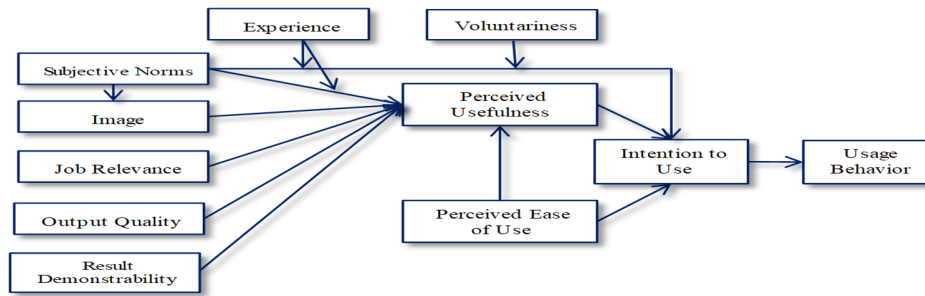
Figure 4. Technology acceptance model 2 (TAM 2)

Source. Venkatesh and Davis (2000).

Yet, one of the limitations of TAM2 is that it is only developed on the determinants of TAM's perceived usefulness (Lai 2017). In addition, the concentration of TAM2 is on explaining the external factors affecting perceived usefulness, while no equivalent explanation for the external factors affecting perceived ease of use are included in the model.

Aside of that, Turan et al. (2015) argue that TAM should be combined with Innovation Theory as a proposed framework that explains system's user behavior, employing the role of a set of variables such as End-User Satisfaction, and User Involvement. They began building a model that illustrates system's user behavior based on the TRA, TPB, TAM, and the theory of innovation (TI), but they did not validate the model experimentally.

1.1.4 The Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) developed UTAUT theory. The main contribution of the UTAUT is integration of eight models and theories (Note 1) that have addressed the behavior of technology users. This model could predict about 60% to 70% of the cause of differences in individuals' intention to accept and use the technology (Loose et al., 2013; Venkatesh, et al., 2003; Venkatesh, et al., 2012). These dimensions are PE, EE, SI, and FC with the moderation of age, gender, experience, and Voluntariness of use, as shown in Figure (5)
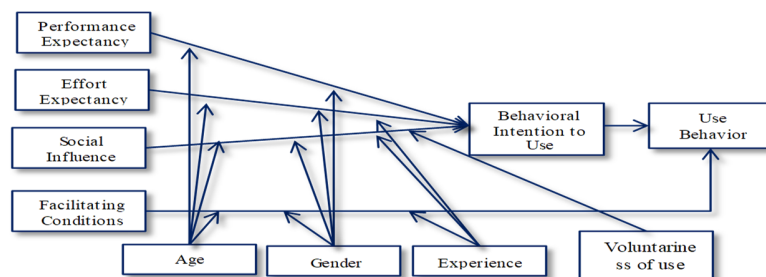

Figure 5. The unified theory of acceptance and use of technology (UTAUT)

Source. Venkatesh et al (2003).

Jen et al. (2009) pointed out that TAM had the best parsimony, followed by UTAUT in the area of technology acceptance, Where thier finidngs refered that TAM has best simplicity. Unlike Jen et al. (2009), Hariri and Roberts (2015); Indrati et al. (2011); Jong and Wang (2009) metioned that UTAUT's explanatory power (R^2) is better than TAM in explaining the users adaptation with IT.

Hariri and Roberts (2015) pointed out that UTAUT model is considered to be one of the best models for predicting the user's behavior toward accepting the technology. Similarly, Jong and Wang (2009) pointed out that UTAUT is the best model for predicting technology adaptation, as it explaned 70% of variance in intention to use technology verses 40% only for TAM.

On the other hand, Samaradiwakara and Gunawardena (2014), in their nartive study of different existing models and theories indicated that UTAUT has better ability to predict behavioral intention of using technology than TAM and TAM2, where the explained variance (R^2) of UTAUT was 69%, While it was 53% in TAM2 and 52% in TAM.

In the area of internet banking adaptation, Indrati et al. (2011) provided an empirical comparison between TAM and UTAUT to identify which model is more capable of interpreting the behavior of internet banking users. They pointed out that the UTAUT model is better than TAM in predicting users behavior toward the internet banking adaptation, where the result of discriminant analysis were 81.5% to UTAUT versus 71.0% to TAM.

From previus review, we belive that the UTAUT model will enrich the research field to measure technology acceptance better than TAM model. We are guided by Hariri and Roberts (2015); Indrati et al. (2011); Jong and Wang (2009); Samaradiwakara and Gunawardena (2014) which refered that UTAUT model is better in interpreting the behavior of technology user.

1.2 Model Variables

1.2.1 Performance Expectancy (PE)

Aalberg et al. (2013) defined performance expectency (PE) as the degree to which individuals believe that using a particular system will lead to better outcomes such as improved quality of work, while ;Scott & Lewis, (2017); Venkatesh et al. (2003) defined PE as the degree to which an individual believes that using the system will help him/her to attain gains in job performance. Thus, we can define it as *"the degree of the customer's conviction that the use of technology will help to improve the results of the required service."*

There are various points of view regarding the importance of PE as one of the factors that increase the BI to adapt with e-banking services. Albashrawi et al. (2019) pointed out that PE contributed to increasing customer's BI towards e- banking services. Similarly, AbuShanab & Pearson, (2007); Alalwan et al., (2017); Im et al., (2011); Jung et al., (2020); Thusi & Maduku, (2020) claimed that PE contributed positivelly to increasing customer's BI toward adapting with e- banking services.

In Egypt, there are few studies that tested the effect of PE on BI to adapt with e-banking services, and therefore researchers aim to test the following hypothesis:

H1: Performance expectancy will have a positive effect on behavioral intention to adapt with e-banking services.

1.2.2 Effort Expectancy (EE)

Effort Expectancy (EE) is defined as the degree of ease associated with using a particular technology (Aalberg et al., 2013; Venkatesh et al., 2003; Cowan & Daim, 2013). It has been defined as the degree of ease associated with using computer systems (Taiwo, 2019). Thus, it can be defined as *"the degree of the customer's belief that the use of technology will facilitate the process of obtaining the required service."*

Some studies claimed that EE has a positive effect on BI such as: AbuShanab and Pearson (2007); Alalwan et al., (2017); Gupta and Arora, (2019); Im et al., (2011); Karjaluoto et al., (2019); Okonkwo, (2012); Sharma et al.,(2020). Unlike Baptista and Oliveira (2015), Jung et al. (2020); Soh et al. (2020); Thusi and Maduku (2020); Yueh et al. (2015), indicated that the EE didn't have a significant effect on the customer's intention to adapt to the use of technology.

On the other hand, a few studies in Egypt have tested the effect of EE on customer's BI to adapt with e-banking services. So, we aim to test the following hypothesis:

H2: Effort expectancy will have a positive effect on behavioral intention to adapt with e-banking services.

1.2.3 Social Influence (SI)

Social Influence (SI) is defined as the degree to which the individual perceives that other users think he/she should use a particular system or technology (Aalberg et al., 2013), while others defined it as the degree to which an individual perceives that important individuals (such as family members or friends) believe they should use a computer system or new technology (Taiwo, 2019; Venkatesh et al., 2003). Based on that it coud be defined as *"the degree of influence of the individual's close social circle on the use of a particular technology in order to obtain the desired service."*

Many studies have indicated the importance of SI as one of the factors affecting the customer's BI. For example; Al-Gahtani et al. (2007) indicated from the empirical results that the SI is one of the factors that contribute to predicting the behavioral intention of customers to adapt to the use of technology. Similary, Albashrawi et al., (2019); Giri et al., (2019); Gupta et al., (2019); Jung et al., (2020); Okonkwo, (2012); Sharma et al., (2020); Soh et al., (2020) also pointed out that SI positively contribute in predicting customer's BI to adapt with e-banking services.

In the contrary, , Egyptian community hasn't been sufficiently tested to learn about the extent of the impact of SI on BI to adapt with of e-banking services. Thus, the following hypothesis can be formulated:

H3: Social influence will have a positive effect on behavioral intention to adapt with e-banking services

1.2.4 Facilitating Condition (FC)

Facilitating Conditions (FC) are defined as the degree to which individuals believe that the existing technological and organizational infrastructure supports the use of a particular system or technology (Aalberg et al., 2013; Venkatesh et al., 2003). Also, It is defined as the degree to which the individual believes that the organizational and technical infrastructures are available to support the use of the system (Taiwo, 2019). Based on the foregoing; we can define it as *"the extent of the customer's awareness of the availability of the infrastructure that supports the technical process of obtaining the electronic service."*

Some studies claimed that FC has a positive effect on BI, such as Gupta and Manrai (2019); Jung et al. (2020); Okonkwo (2012); Patil et al. (2020); Sharma et al. (2020); Soh et al. (2020). Unlike Baptista and Oliveira (2015); Thusi and Maduku (2020) indicated that the FC does not have a significant effect on the customer's intention to adapt to the use of technology.

FC haven't been adequately tested in the field of e-banking services in Egypt. So, we aim to test the following hypothesis:

H4: Facilitating condition will have a positive effect on behavioral intention to adapt to the use of technology.

1.2.5 Behavioral Intention (BI)

The concept of behavioral intent refers to the probability that individual will be engaged in a certain behavior (Yang, 2019). It also is defined as the possibility of an individual to repeat a certain action or decision (Camillo, 2015). Or a mental attitude towards making a specific choice and then taking action to implement that choice (Abdu & Al-kadi, 2020). In addition, An individual's intention to use a particular technology directly affects the actual use (Khosrow-Pour, 2018). So, it can be defiend as *"the degree of customer willingness to adapt to new technology."*

The researchers assume that BI can be influenced by many motivational factors such as PE, EE, SI, and FC (Darmansyah et al. 2020; Dongmo, Kamdjoug, and Wamba 2020; Jamshidi et al. 2018; Rahi et al. 2019). Serveral findings indicated that the BI is one of the strongest factors that contribute to predicting adaptive behavior (AB) with the use of technology (Alalwan et al., 2016; Albashrawi et al., 2019; Baptista & Oliveira, 2015; Chua et al., 2016; Dwivedi et al., 2017; Gupta et al., 2019; Karjaluoto et al., 2019; Patil et al., 2020; Sharma et al., 2020; Zhou, 2012).

Also, like other hypotheses, there are few studies that have tested the effect of BI on AB in Egypt. So, we aim to test the following hypothesis:

H5: Behavioral intention will have a positive effect on adaptive behavior with the use of technology.

1.2.6 Adaptive Behavior (AB)

Adaptive Behavior (AB) defined as a change in individual behavior to meet new requirements (Stokes et al., 2008), and it is also defined as the ability to adapt to new situations (Fidan, 2018). In addition, it is defined as the suitability of the current situation with technological improvements (Khanthachai et al., 1987), as well as the constant desire to adapt to technological change and innovations (Chandra, 2006). We can define AB as *"the behavioral response to technological change in the e-service provided."*

1.2.7 Accessibility (ACC)

Accessibility (ACC) is an element of the e-banking marketing mix (4A's): accessibility, awareness, affordability, and acceptability (Sheth and Sisodia 2012). It is defined as the extent to which customers are able to obtain and use the service easily (Sheth & Sisodia, 2012). We can define it as "*the extent of the customer's ability to access and obtain e-banking services.*"

Based on the prior literature, ACC as one of the 4A's marketing mix hasn't been adequately tested as a moderator variable with UTAUT's independent variables (PE, EE, SI, and FC) in the field of e-banking services in Egypt. So, we aim to test the following hypotheses:

H6: Accessibility will moderate the relation between performance expectancy and behavioral intention to adapt with e-banking services.

H7: Accessibility will moderate the relation between effort expectancy and behavioral intention to adapt with e-banking services.

H8: Accessibility will moderate the relation between social influence and behavioral intention to adapt with e-banking services.

H9: Accessibility will moderate the relation between facilitating condition and behavioral intention to adapt with e-banking services.

2. Research Methods

2.1 The Research Model

Based on the theoretical framework, the researchers use service accessibility (ACC) as one of the elements of the 4A's marketing mix in developing UTAUT model, in order to increase the interpretation rate (R^2) of the AB of customers toward technological change in e-banking services. Figure (6) illustrate the proposed model and the relations between the study variables:
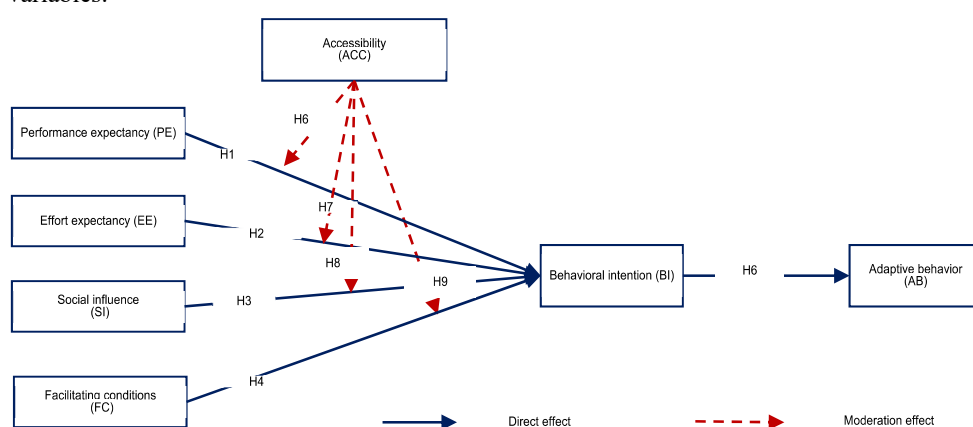
Figure 6. The research model

2.2 Sample and Procedure

The study population includes customers who use e-banking services Egypt. The population size was estimated at (39.6) million customers, according to the report of the Central Bank of Egypt in June 2020. Depending on the sample size estimation table by Krejcie & Morgan, (1970), the appropriate sample size is (384) customer. According to Hair et al. (2019) the larger sample size, the greater reliability degree of test results. So, the sample size will be increased to (600) customer. We used the simple random sampling method as the study adapts the quantinitavie research approach. The questionnaire was distributed to 600 customer in Sohag, Qena, Luxor and Aswan. The number of responses was 545 customer, with a 93.8% response rate.

2.3 Measurements

For the measurement of UTAUT theory variables, it was mainly relied on (Venkatesh et al. 2003) with other supporting studies, and as for the service accessibility as one of the 4A's marketing mix, we relied on (Goularte and Zilber 2019; Lichtenstein and Williamson 2006; Paim, Delafrooz, and Taleghani 2014) measure the variables. Each variable was measured by (4) statements, using the five-point Likert scale, which ranges between strongly agree (5 points) and strongly disagree (1 degree).

In order to verify the validity of the measurement, exploratory factor analysis and Cronbach's alpha test were performed on an initial sample of 40 customers. Table 1 illustrate the measurement validity:

Table 1. The measurement validity

Statements	Exploratory factor analysis matrix (EFA)							References
	(PE)	(EE)	(SI)	(FC)	(BI)	(AB)	(ACC)	
PE.1: I gain benefits from using e-banking services.	0.85							(Sahu and Kavita 2020; Venkatesh et al. 2003)
PE.2: I believe that using e-banking services helpful in completing banking transactions faster.	0.82							
PE.3: Using e-banking services increases the rate of obtaining the service.	0.78							
PE.4: I find better advantages in e-banking services than traditional methods.	0.86							
EE.1: It is easy to understand how to deal with e-banking systems.		0.94						(Venkatesh et al. 2003)
EE.2: It is easy to use e-banking systems.		0.94						
EE.3: It is easy to learn how to deal with e-banking services.		0.79						
EE.4: I find more flexibility in conducting banking transactions electronically.		0.79						
SI.1: I use e-banking services because most of my colleagues and friends use them as well.			0.81					(Bashir and Albarbarawi 2011; Ngugi et al. 2020; Venkatesh et al. 2003)
SI.2: People close to me think that I should use e-banking.			0.78					
SI.3: People whose I trusted them would prefer that I use e-banking services.			0.76					
SI.4: Family and friends may influence on my decision to use e-banking services.			0.76					
FC.1: The Bank shall provide a sufficient number of ATMs to obtain the service.				0.76				(Venkatesh et al. 2003)
FC.2: I have the necessary knowledge on how to use e-banking services.				0.79				
FC.3: The bank provides appropriate facilities to ensure access to the service.				0.86				
FC.4: Customer service provides assistance in overcoming the difficulties that I find with the banking system.				0.82				
BI.1: I intend to use e-banking services in the coming periods.					0.62			(Özlen and Djedovic 2017; Sahu and Kavita 2020; Venkatesh et al. 2003
BI.2: I expect that I will use e-banking services in the future.					0.91			
BI.3: I plan to use e-banking services in the next few months.					0.88			
BI.4: I prefer to use e-banking services instead of traditional methods.					0.64			
AB.1: I usually use e-banking services frequently.						0.41		(Bashir and Albarbarawi 2011; Al Gaifi 2011; Özlen and Djedovic 2017)
AB.2: I usually use ATMs, the bank's website or mobile applications to balance check, pay bills or banking transfers.						0.56		
AB.3: I continuously use e-banking services in conjunction with the technological development on them.						0.58		
AB.4: I use some additional improvements on e-banking services (such as recharging the Internet or phone balance from ATMs or deposits).						0.79		
ACC.1: I can access ATM outlets or get the service online easily.							0.82	(Goularte and Zilber 2019; Lichtenstein and Williamson 2006; Paim et al. 2014)
ACC.2: Accessing the banking service electronically is not complicated.							0.85	
ACC.3: I can easily access banking services electronically at all times.							0.82	
ACC.4: I believe that it is possible to obtain the e-banking service anywhere and anytime.							0.64	
Cronbach's alpha	0.92	0.93	0.94	0.93	0.86	0.87	0.92	

The Unweighted Least Squares Method and the Varimax method were used to extract the factorial analysis matrix, which works to wrap statements around a specific variable, and EFA coffetient ≥ 0.4 can be accepted (Hair et al. 2019) The results of this matrix illustrated that all EFA's statements ≥ 0.4. On the other hand, Cronbach's alpha value ≥ 0.80. It can be said that an adequate value of reliabilty is available as Cronbach's alpha is ≥ 0.7 (Hair et al. 2019).

Convergent Validity

Convergent validity is known as the conformatory factor analysis (CFA) which refers to the extent to which the statements of each variable are interrelated with each other. The statements scale is acceptable if the standardized loading estimates (SLE) is ≥ 0.5, and the ideal value for convergent validity is considered when SLE is ≥ 0.7 (Hair et al. 2019). Convergent validity can be clarified in the following Figure 7.
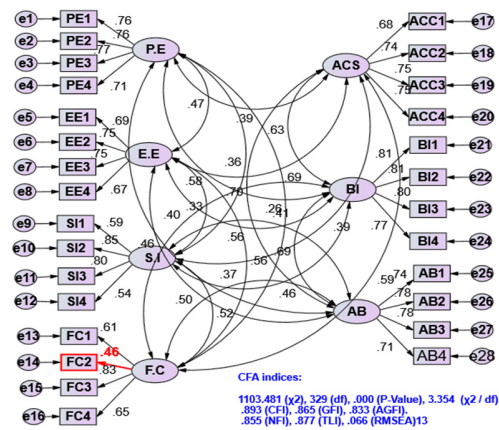
Figure 7. Confirmatory factor analysis

From the previous figure, we noticed that all statements' SLE ≥ 0.5 except FC2. For CFA refenment, FC2 will be deleted. Also, modification indices (MI) are used as well to reduce the value of the chi-square and raise the level of improvement of the CFA. Table (2) illustrate the possible modifications in the model.

Table 2. Possible modifications in the model

Variable				M.I.	Refinement way
PE	e3	<-->	e4	6.597	Covariate the latent variables (Arbuckle 2010)
EE	e5	<-->	e6	13.674	
	e5	<-->	e8	9.51	
SI	e9	<-->	e11	24.1	
	e9	<-->	e12	50.418	
FC	e13	<-->	e15	9.834	
ACC	e17	<-->	e19	8.184	
AB	e25	<-->	e27	25.627	
	e26	<-->	e28	23.57	
	e25	<-->	e28	18.775	

CFA after refunment can be clarified in the following Figure 8.

Figure 8. Confirmatory Factor Analysis after refinements

In addition, a number of idicators needed to esure the godness of model fit can be clarified as follows:

Table 3. CFA fit idicators

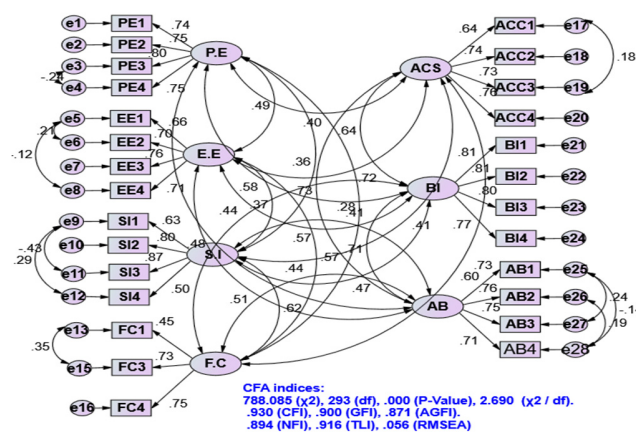| Indicator	Recommended value	Reference	Measured value
(χ2/df)	χ2/df <5 acceptable fit; χ2/df <3 good fit	(Awang 2012; Gheshlagh et al. 2018)	2.690 Good fit
P-value of Chi-Square	A level of significance ≥ 0.05 can be accepted if the sample size is greater than 200 items	(Awang 2012; Gheshlagh et al. 2018; Schumacker and Lomax 2004; Thakkar 2020)	0.000 Acceptable Fit
RMSEA	RMSEA > 0.08 poor fit; RMSEA (0.05 to 0.08) good fit; RMSEA (0 to 0.05) perfect fit	(Awang 2012; Gheshlagh et al. 2018; Thakkar 2020)	0.056 Good fit
CFI	≥ 0.90 good fit	(Awang 2012; Hu and Bentler 1999; Schumacker and Lomax 2004; Thakkar 2020)	0.930 Good fit
GFI	≥ 0.90 good fit; ≥ 0.80 acceptable fit	(Awang 2012; Schumacker and Lomax 2004)	0.900 Good fit
AGFI	≥ 0.80 good fit	(Abedi, Rostami, and Nadi 2015; Gheshlagh et al. 2018; Schumacker and Lomax 2004; Thakkar 2020)	0.871 Good fit
NFI	≥ 0.90 good fit; ≥ 0.80 acceptable fit	(Abedi et al. 2015; Awang 2012; Thakkar 2020)	0.894 Acceptable Fit
TLI	≥ 0.90 good fit	(Awang 2012)	0.916 Good fit

Through CFA fit idicators, it can be noted that all indicators have reached an acceptable or good fit levels. Thus, it is possible to use these measures to run the structural equation modeling (SEM) of the study model.

2.4 Discriminant Validity

Discriminant validity is a component of construct validity and focuses on the degree to which two variables differ from each other (Hair et al., 2019). This scale aims to prove that each scale in the analysis has discriminatory validity from all other scales. To ensure discriminant validity, three indicators are checked: (i) Construct reliability (CR) ≥ 0.7; (2) the extracted mean variance (AVE) ≥ 0.5; (3) Comparing the Average Variance Extracted (AVE) with the Maximum Shared Variance (MSV), estimates of AVE should be > MSV (Hair et al. 2019). The indicators of discriminant validity are shown in the following table.

Table 4. Discriminant validity

	CR	AVE	MSV	MaxR	EE	PE	SI	FC	ACC	BI	AB
EE	0.807	0.512	0.483	0.811	0.716						
PE	0.837	0.561	0.336	0.838	0.471	0.749					
SI	0.795	0.500	0.278	0.839	0.329	0.362	0.707				
FC	0.747	0.501	0.341	0.787	0.524	0.250	0.527	0.708			
ACC	0.821	0.534	0.487	0.823	0.695	0.387	0.387	0.584	0.731		
BI	0.875	0.637	0.483	0.876	0.558	0.580	0.464	0.392	0.626	0.798	
AB	0.839	0.566	0.487	0.842	0.502	0.464	0.412	0.370	0.698	0.695	0.753

We note from the previous table the following: that for all variables (CR) ≥ 0.7, (AVE) ≥ 0.5, and (AVE > MSV). Thus, it can be indicated that there is an adequate amount of discriminant validity.

2.5 Structural Equation Modeling (SEM)

Structural equation modeling (SEM) is a multivariate analysis that aims to estimate the effect of a set of variables simultaneously on a one or more dependent variables (Hair et al. 2019).

In the following figure , the study hypotheses will be tested by SEM in two steps: first SEM before ACC entrance as a moderating variable, second SEM after entering the moderating variable, in order to identify the extent of the change in the model explanatory power (R^2). Figure (9) shows the results of SEM for hypotheses 1 to 5.
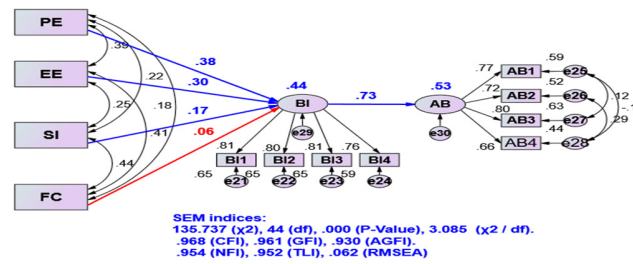
Figure 9. SEM before ACC entrance as a moderator variable

Based on the same creteria (mentioned in tabe 3) to ensure the goodness of fit for SEM, it can be seen in figure (9) that all SEM' goodness of fit indices reached an apropraite level of model fit , that enabled us to run SEM for hypotheses 1 to 5, which illustrated in Figure (9) and Table 5.

Table 5. Result of SEM

	Path	Standardized Estimate	Estimate	P	R2
H1	PE➔BI	.377	.046	***	44%
H2	EE➔BI	.301	.043	***	
H3	SI➔BI	.174	.028	***	
H4	FC➔BI	.055	.037	.189	
H5	BI➔AB	.729	.060	***	53%

As shown in table (5), all SEM's paths were supported, except H4. Where PE ($\alpha=0.377$, $P=0.000$), EE ($\alpha=0.301$, $P=0.000$), and SI ($\alpha=0.174$, $P=0.000$) significantly and positivly affect BI (R$^{2=}$ 44%). and BI ($\alpha=0.729$, $P=0.000$) significantly and positivly affect AB (R$^{2=}$ 53%).
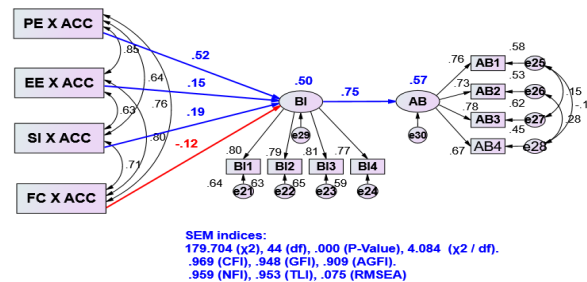
Figure 10. SEM after ACC entrance as a moderating variable

Table 6. Regression weights: (group number 1-default model)

	Path	Standardized Estimate	Estimate	P	R2	Δ R^2
H6	PE_×_ACC ➔BI	.520	.076	***	50%	+6%
H7	EE_×_ACC ➔BI	.154	.021	.034		
H8	SI_×_ACC ➔BI	.195	.025	***		
H9	FC_X_ACC ➔BI	-.116	-.016	.070		
	BI➔AB	.753	.845	***	57%	+4%

As shown in table (6), after the entrence of the moderatoring varible (ACC), all SEM's paths were supported, except H9. Where PE×ACC ($\alpha=0.520$, $P=0.000$), EE×ACC ($\alpha=0.154$, $P=0.000$), and SI×ACC ($\alpha=0.195$, $P=0.000$) significantly positivly effect on BI with 50% R^2. And BI ($\alpha=0.753$, $P=0.000$) significantly and positivly affect AB ($R^2= 57\%$).

Aside of that, the moderatoring role of ACC increases BI's R^2 from 44% to 50% with $\Delta R^2 = +6\%$, and increase AB's R^2 from 53% to 57% with $\Delta R^2 = +4\%$.

3. Discussion

Finfings of hypotheses testing indicated that there is a positive effect of performance expectency (PE), effort expectency (EE), and social infulence (SI) on the customer's behavioral intention (BI), while facilitating conditions (FC) did not have any significant effect on the customer's behavioral intention (BI). There is a positive significant effect of PE on the customer's BI towards technological change in e-banking services. This result is found to be consistent with those of previous studies (AbuShanab & Pearson, (2007); Alalwan et al., (2017); Albashrawi et al., (2019); Baptista & Oliveira, (2015); Chua et al., (2016); Dwivedi et al., (2017); Gupta & Arora, (2019); Im et al., (2011); Jung et al., (2020); Karjaluoto et al., (2019); Okonkwo, (2012); Sharma et al., (2020); Soh et al., (2020); Thusi & Maduku, (2020); Venkatesh et al., (2003)).

The results indicated that performance expectency (PE) is the most important and the strongest independent variables in predicting the customer's BI towards adapting to the use of e-banking services. This means that the greater the benefits of e-banking services, the greater the customers' willingness to accept and adapt with new technological updates that are employed in providing such services.

Smillarly to AbuShanab and Pearson (2007); Alalwan et al. (2017); Albashrawi et al. (2019); Chua et al. (2016); Dwivedi et al. (2017); Gupta and Arora (2019); Im et al. (2011); Karjaluoto et al. (2019); Okonkwo (2012); Sharma et al. (2020); Venkatesh et al. (2003) a positive significant effect found for EE on the customer's BI towards technological adoption. In addition, EE represented the second important variable in predicting BI. That's mean the expected ease of use of e-banking services contributes positively to increasing the customer's adaptation to technological updates, and helps in motivating the customers to adapt with new provided e-banking services.

Social Infulence (SI) is ranked third in terms of the degree of BI interpretation, where the results indicated a positive significant effect of SI on the customer's BI towards the technological change in e-banking services, and this result agrees with many previous studies' findings (AbuShanab & Pearson, 2007; Alalwan et al., 2017; Albashrawi et al., 2019; Chua et al., 2016; Dwivedi et al., 2017; Gupta & Arora, 2019; Im et al., 2011; Karjaluoto et al., 2019; Okonkwo, 2012; Sharma et al., 2020; Venkatesh et al., 2003). Otherwise, some findings did not support this relationship, such as (Okonkwo 2012; Thusi and Maduku 2020). . This result can be explained as the close social circle to customers provide positive opinions about their previous experiences towards using e-banking services, which positively affects the customer's intention to adapt with e-banking services.

Findings do not support facilitating conditions (FC) impact on BI, that's disagree with a set of other researches' findings such as Albashrawi et al. (2019); Gupta and Arora (2019); Sharma et al. (2020), while Baptista & Oliveira, (2015). However, this result is found to be inline with Thusi & Maduku, (2020) study which came up with the same conclusion.

Behavior Intention (BI) has a positive significant effect on customer's adaptive behavior (AB) towards technological change in e-banking services. Serveral strudies agreed with this finding (Alalwan et al., 2017; Albashrawi et al., 2019; Baptista & Oliveira, 2015; Chua et al., 2016; Yogesh Dwivedi et al., 2017; Giri et al., 2019; Gupta & Arora, 2019; Im et al., 2011; Karjaluoto et al., 2019; Patil et al., 2020; Sharma et al., 2020; Venkatesh et al., 2003), while there were no findings have found negates the significance of this relationship. Thus, it can be noted that if the customer has an internal psychological tendency to adapt to the technological change in electronic banking services, this will lead to a specific action or behavior to use e-banking in the future.

For the service aceessability (ACC), SEM results indicated that these hypotheses was accepted (partially), as there was a moderation role of ACC changes the strength of the effect of (PE, EE, SI) on the customer's BI towards adapting with technological change in e-banking services. While, ACC did not play a moderation role with FC in its impact on BI.

Aside of that, service accessability (ACC) as one of the 4A's marketing mix added a remarkable predicting power to the model, while behavioral intention (BI)'s R^2 increased by 6% once service accessability (ACC) entrerd as a moderator variable with the UTAUT's independent contracts. Similarly, adaptive behavior (AB)'s R^2 increased as

well by 4%. That's means that the customer's ability to access to the e-banking services enable us from better predicting the level of psychological and mental readiness to adapt to electronic banking services.

4. Implications

4.1 Theoretical Indications

The application of the Unified Theory Model of Acceptance and the Use of Technology (UTAUT) in technology acceptance research has become more popular in recent years. This is because of its theoretical ability to explain users' intent or user behavior significantly. Based on eight theories to explain customer behavior in the field of technology, this study aimed to integrate UTAUT theory within marketing area by employing the service ACC as one of 4A's e-banking marketing, after noting a tangible research gap for this theory in the marketing fields. The service accessability (ACC) contributed to improving the degree of interpretation of behavioral intention (BI) to adapt new technology (from (44%) to (50%)) in our study. In the maintime, it also contributed to increasing the degree of interpretation of adaptive behavior (AB) (from (53%) to (57%)), which indicates the importance of making the service available to the customer and enabling him/her to access it appropriately. In general, accessabilty (ACC) as one of 4A's e-banking marketing contributed to improving the degree UTAUT's interpretation at the level of BI and AB.

4.2 Managerial Implications

In general, the current study is one of the fewer studies in Egypt that aimed to integrate service accessability (ACC) as one of 4A's e-banking marketing with the UTAUT for users of e-banking services. A set of factors have been identified that help bank managers and decision makers to increase the adaptive behavior(AB) of customers towards technological changes in e-banking services.

Performance expectency (PE) is the most important factor that affects the users' BI e-banking service provided in Egypt. Therefore banks managers should work towaards improving the level of e-service quality and speed of completion of the e-transaction is one of the most important factors that constitute psychological readiness and the mentality to adapt technological changes.

Reducing the degree of complexity and facilitating the procedures for obtaining e-banking service will increase the customers opportunity to adapt to the use of such services in Egypt. The social aspect can also be exploited by promoting the benefits and features associated with e-banking services to the largest possible segment of customers, which transfer the positive experiences with the social circle close to them. This will motivate the potential customers to adapt quickly to the changes and updates that take place on this type of services.

As well, enhancing the customer's ability to access the banking service by providing easy-to-use electronic applications on smart phones, easy-to-design websites, in addition to providing a larger number of electronic teller machines, wll motivate the rest of the potential customers to adapt quickly to the new e-services offered by the bank.

5. Limitations and Future Research

Due to geographical limitations, the study sample was collected from selected governrates in Upper Egypt region (Sohag, Qena, Luxor and Aswan). More studies are needed for other areas nationwide in Egypt.

Based on the results of the study, there was no significant role for facilitating conditions (FC) as one of the determinants of UTAUT, So, it is recommended to test the effect of facilitating condition on the customer's behavioral intention towards technological change in e-services.

The study focused only on service accessability (ACC) as one of the 4A's marketing mix, and future researches are also recommended to test the remaining elements of the electronic banking marketing mix (4A's) in the Egyptian context such as: the moderation role of *affordability* toward customer's adaptation with technological change in e-banking services, evaluation the moderation role of *awareness* toward customer's adaptation with technological change in e-banking services and the moderation role of *acceptability* toward customer's adaptation with technological change in e-banking services with reference to UTAUT.

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