

## **Determination of the TOE Factors influencing the Adoption of Internet Banking Services on SMEs in Yemen: A Moderated Mediation Approach**

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**Abstract**—The main purpose for carrying out research on the adoption of the internet banking services is due to the lack of empirical studies on Yemeni internet banking services. The objective of this study is to explore and investigate the factors of Technology-Organization-Environment theory (TOE) that play a main role in the implementing of Internet banking services by SMEs in Yemen. Four exogenous variables, one mediator, one moderator, and one endogenous variable make up the current study's framework. The exogenous variables consist of security, relative advantages, government support, top management and organization readiness as mediator as well as organization type is moderator while the endogenous variables comprise of intention towards Internet Banking (IB) for banks customers (SMEs). This research also identifies the role of organization readiness as mediating variable that impact SMEs' intention to adopt Internet banking service and also the role of organization type as a moderator between organization readiness and Internet banking adoption. The current study's sample included 314 people who were analyzed using Partial Least Square PLS-SEM to look for causal links between the study's latent variables. The findings showed that security, relative advantages, government support, top management and organization readiness have a significance and positive effect on intention towards Internet banking adoption among SMEs in Yemen. Furthermore, the findings of the study reveal that organization readiness has a mediating influence on the relationship between TOE factors and intention towards IB adoption among SMEs. Moreover, the results indicate organization type moderates the relationship between organization readiness and intention to adopt IB. In conclusion, the finding shows that SMEs businesses are able to operate more effectively by implementing a broad set of IB products through automating many of their major banking activities and through electronic communication with their banks.

**Keywords**— TOE, Internet banking, TOE, Organization readiness, Behavior Intention, SMEs, Yemen.

## **1 Introduction**

Internet banking services (IBSs) are greatly useful to banks as well as customers. They are useful for banks in terms of safety cost, reach a higher percentage of the population, they are efficient in improving the reputation and better customer service satisfaction of costumers [1], [2]. IBS also provides banks with an unlimited distribution network, thereby offering a competitive advantage. The adoption of IBS renders banks with cost effective transactions and strengthens the bond between bankers and costumers. Indeed, the advancement of Internet networks and high-value financial services can be offered at lower costs through the internet. [3]. In spite of the fact that, Yemeni banks produce electronic infrastructure and spend tremendous amount of money annually to adopt electronic banking, the adoption of electronic banking and IBS in Yemeni banks is relatively low among small and medium-size enterprises (SMEs) [4]– [6]. Furthermore, the study of [7] has proclaimed IBS as beneficial in that customers are offered access to bank services at a fast rate and with comfort without requiring being present at the bank. Additionally, to ensure being ahead in the progressively competitive financial service market, a comprehensive IBS stratagem is vital.

Although e-banking has a lot of advantages, many banks' consumers do not embrace these advanced of technologically services offered by the banks especially in the Arab countries and in Yemen in particular [4], [5], [8], [9]. Internet banking technology in Yemen has not reached its maturity yet, as it is scarcely used by retail or corporate customers and there is a prevalence in the culture that favors face-to-face banking and personal contact. Relatively small empirical study has been implemented to understand the factors that influence the use of internet banking by SMEs, and its consequential effects, despite this impending strain. [10]

For that reason, there should be additional research to comprehend the relevance of IB in Yemen, to recognize areas that are underdeveloped in establishments, primarily in SMEs. To fill a gap in the research, we investigate TOE elements such as technological variables (relative advantages, security), organizational aspects (management support and organization preparedness), and environmental aspects (government support).

This study aims to contribute to the body of knowledge in the field of technology acceptance by expanding our understanding of the factors that influence IB adoption by SMEs in Yemen. As a result, the study's major goal is to look at the factors that influence SMEs' willingness to use Internet banking in Yemen. Furthermore, the study looks into the function of organization preparedness as a mediator between TOE characteristics and SMEs' aims for the usage of internet banking in Yemen.

## **2 Literature Review**

### **2.1 Internet Banking Services in Yemeni Banks**

Arab Bank, The Yemen Gulf Bank, International Bank of Yemen, Yemen Commercial Bank, and CAC Bank [4], [8], [11] are the five banks that provide IBS in Yemen.

Customers can use these banks for services such balance inquiries, annual statements of account, account-to-account transfers, account-to-account transfers, check book requests, and pin code changes.

## **2.2 SMEs and Yemen Economy**

Yemen's economy is primarily based on oil, and the Yemeni government derives the majority of its revenue from oil-related taxes [12] [4]. The SMEs industry in Yemen is critical to the country's economy. SMEs have long been regarded as the economy's mainstay, and they play an important role in creating jobs, improving human resource quality, and cultivating an entrepreneurial culture, in addition to supporting large-scale businesses and creating new business prospects [4], [5], [13].

Micro, small, and medium companies (MSMEs) employ around 90 percent of Yemen's workers and contributed 95 percent of the country's GDP in 2007 [4], [14]. Furthermore, recent estimates put the number of MSMEs at over 378,305. Micro businesses (those with fewer than four employees) account for more than 350,138, while small businesses account for 17,248. (with 5-9 employees). However, there are roughly 10,919 medium-sized businesses (having 10 to 50 employees).

## **2.3 Internet Banking Adoption**

Internet banking adoption means “the customers use of many services represented in inquiring about an account balance application for a loan, remitting money from one account to another and many other services that are basically carried out online” [11] The adoption of e-banking technology depends on a number of factors.

Personal touch with banking employees, technology anxiety, a large network of current branches, and limited computer proficiency among customers are all factors impacting client non-adoption of IB [12]. The lack of availability, rather than their avoidance of the technology during its infancy [18], has been determined to be the main cause for customers not embracing ATMs [17]. In general, whether a consumer has access to e-banking technology is determined by whether they are a customer of a bank that offers a number of services, including computer banking. Furthermore, it has been stated that consumers' perceptions of innovation as well as socioeconomic factors have influenced their adoption of technological innovation.

## **2.4 Technology Organization Environment (TOE) Framework**

Technology-Organization-Environment (TOE) framework was established by [13]. The TOE framework is a frequently used framework for IT system adoption in organizations. It is one of the most effective alternatives to other IT adoption theories [19]. Furthermore, the TOE framework illustrates how a corporation can accept technology innovation not only owing to technological considerations, but also owing to organizational and environmental factors. These three factors create both challenges

and opportunity for technological advancement [20]. They also indicate that the technical context encompasses the organization's internal and external technology. The organizational context encompasses the organization's traits and resources, such as its size and scope, as well as its management structure. Industry features, technology support infrastructure, government regulation, and the firm's competitors are all part of the environmental context [10]. Although the association between organizational preparedness and SMEs' desire to embrace electronic data interchange (EDI) is significant, it has been discovered that the effect of organizational readiness on SMEs' intention to implement EDI is not strong.

## **2.5 Factors Influencing IB Adoption (Independent Variables)**

The technology-organizational-environment framework (TOE) identifies three characteristics to explain a firm's decision-making behavior in relation to technological innovations" [13]. The TOE framework has been used in previous research in many "information and communication technology (ICT) innovation" and IS factors. It was used in studying various IS innovations. By examining these factors, a greater understanding of why a company does, or does not, adopt a new technology could appear [14]–[16]. In the study [17] the factors have examined with extent of organizational usage of Business Intelligence & Analytics (BIA) using the TOE Model.

To explain a firm's decision-making behavior in response to technological advancements, the technology-organizational-environment framework (TOE) defines three characteristics" [20]. Many "information and communication technology (ICT) innovation" and IS aspects have been studied using the TOE framework in the past. It was used to research a variety of IT advancements. By evaluating these characteristics, it may be possible to gain a better understanding of why a corporation adopts or does not embrace a new technology [21]– [23]. Using the Technology-Organization-Environment framework, the factors influencing organizational adoption of Business Intelligence & Analytics (BIA) were investigated in the study [24].

### **Technological Context**

#### **a) Security**

Security is critical to the growth of trust in IB because when clients process information of financial and know that it will be handled securely, they feel at peace, and their trust in the bank grows over time. Security worries have also impeded the rise of mobile shopping by negatively influencing customers' willingness to accept it, according to the study.

Furthermore, previous studies reveal that privacy and security are crucial factors that influence users' willingness to use e-based transaction systems.

Many clients are cautious because to the lack of personal touch with the service provider, especially if they believe there will be no recourse if their information or funds are stolen [26], [27]. In other words, a lack of security can restrict fun and, as a result, adoption, whereas a sense of security can promote enjoyment and aid adoption.

#### **b) Relative Advantages**

Relative advantage has been found to be essential variable in determining use of new technologies [18].

Many studies confirmed the benefits of relative advantages are significantly and positive related to IB systems adoption and other related technologies [14], [17], [19]. According to [20], the finding that perceived relative advantages exert influence on m-banking adoption highlights the importance of innovation characteristics to institutions who are involved in the design and development of m-banking services.

According to previous research [21], the relative advantage of IT innovation is one of the factors frequently used in technological innovation adoption studies [29]. Consumer familiarity with internet banking, perceived structural assurance, and relative advantage are all important elements in forming initial trust in internet-only banks, according to [31].

### **Organizational Context**

#### **a) Top Management**

Organizational readiness and top management consider to be factors that impact SMEs' adoption of ES. In [21], it has been reported that without top management commitment, businesses in Malaysia are less likely to adopt e-payment technologies. In many cases, the top management team must mediate between technological and business requirements, as well as settle conflicts of interest among a diverse group of stakeholders.

CEO and top management traits have been proven to be key determinants of technological adoption in SMEs in [33] and [34] studies. Technological knowledge, a supportive environment, passion, leadership styles, academic qualifications, and technology awareness through networking are some of these traits. As a result, the authors consider CEO and top management qualities to be a significant factor in the three stages of technological innovation adoption [29].

#### **b) Organization Readiness**

The level of financial and technical resources available in an organization to implement knowledge management systems is referred to as organizational readiness [35]. The term "perceived organization resources" refers to a company's perceptions of its technical, financial/business, and human resource availability [36].

Organizations that have reached a certain level of technical competence are typically perceived as highly integrated in terms of computerized processes and as more prepared to absorb IT innovation, allowing them to reap higher benefits [37]. The organizational readiness, according to [22], involves infrastructure, necessary systems, and technical capabilities. Although the literature differs in its definition of organizational readiness, all agreed that organizational readiness has a significant impact on SMEs' technology adoption.

### **Environmental Context**

#### **a) Government Support**

[40] contributed to the research of the influencing elements of online banking adoption by incorporating important antecedents into the TAM model, and ultimately discovered that government backing is critical to the trust of online banking products. Government support, on the other hand, was not found to be helpful in the assimilation of m-banking in the Sudanese microfinance industry, according to [30]. This conclusion could be explained by the fact that the majority of responding MFPs are government-owned or semi-government enterprises that receive government assistance by default.

## 2.6 Factors Influencing Ib Adoption (Moderating Variable)

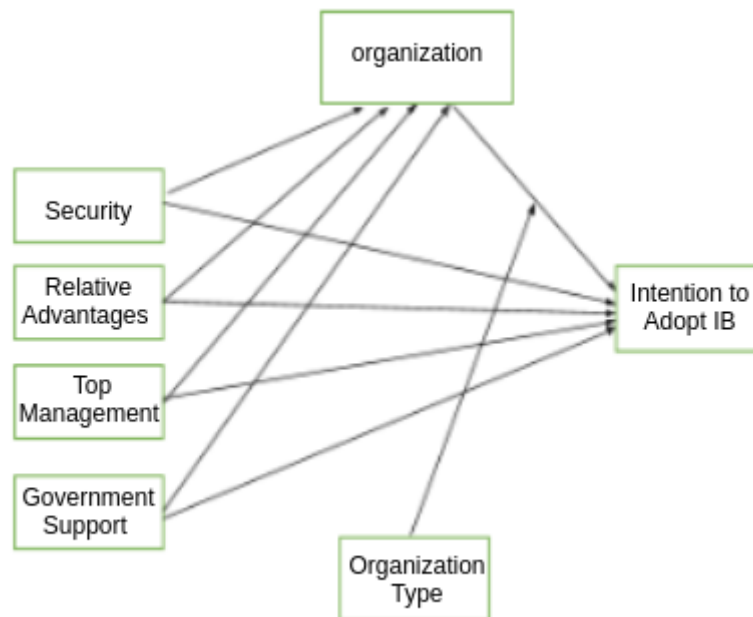
The type of organization or the nature of the business of an organization is a moderator element in this study. As a result, the geographic scope of an organization's operations is defined as its business type. It has been used to categorize corporate entities based on their business characteristics [41].

Moreover, it has been found in [22] that service SMEs have expressed quite different views from manufacturing SMEs in Malaysia. Service SMEs opine that IT network infrastructure hinders them from using ICT.

Another study [43] discovered that the type of business had an effect on both the number of Internet users and the perceived benefit level.

On the other hand, [44] investigated industry categories as a moderating factor that may have substantial influence on the adoption of ICT among SMEs in Malaysia in a study of 406 owners and managers.

## 2.7 Conceptual Framework and Hypotheses Testing



**Fig. 1.** Conceptual Framework and Hypotheses Testing

H1: Security is positively significant influence on Organization Readiness

H2: Relative Advantages is positively significant influence on Organization Readiness

H3: Top Management is positively significant influence on Organization Readiness

H4: Government Support is positively significant influence on Organization Readiness

H5: Security is positively significant influence on BI to adopt IB

H6: Relative Advantages is positively significant influence on BI to adopt IB

H7: Top Management is positively significant influence on BI to adopt IB

H8: Government Support is positively significant influence on BI to adopt IB

H9: Organization Readiness is positively significant influence on BI to adopt IB

H10, H11, H12, H13: Organization Readiness mediates the relationship between TOE factors and BI to adopt IB

H14: Organization Type moderates on the relationship between Organization readiness and BI to adopt IB

### **3 Methodology**

For this topic, a quantitative research design is acceptable. This is because it intends to use hypothesis testing to explore the impact of social media use on humanitarian response via social capital as a mediating function, which necessitates the employment of a quantitative methodology to deal with the data.

Data will be collected using a self-administered survey utilizing a stratified random sample method in this project. Managers and owners of SMEs in Yemen are divided into groups based on the number of employees (population of the sample).

#### **3.1 Design of Questionnaire**

The data for this paper was gathered through a survey. The questionnaire is divided into two sections. The first section contains demographic information about the respondents, such as their organization's activities, kind of organization, and types of activities and programs.

The second portion of the survey will ask respondents about the study's variables of interest, which are (1) intention to use IB and (2) security. (3) comparative advantages, (4) top management, (5) government assistance, and (6) readiness of the company. Factors 2 and 6 are external variables, while factor 1 is an endogenous variable.

A total of 352 questionnaires were returned out of 400, representing an approximate 88 percent response rate. 21 questionnaires were removed from the analysis due to missing values, and 17 cases were outliers; hence, a total of 314 useable questionnaires were included, with a response rate of 73 percent. For this investigation, a sample size of  $n=314$  was deemed adequate. The study sample size ( $N=314$ ) met the 5:1 ratio that was proposed by the researchers [23], [24].

## 4 Analysis of Data

### 4.1 Descriptive Statistics for Variables

The measuring scales' mean and standard deviation (S.D.) were calculated. A five-point Likert scale was utilized in this investigation, with “1” indicating strongly disagreement and “5” indicating strongly agreement.

Table 1 reveals that security and relative advantages had the greatest mean of 3.355 and 3.310 out of a maximum of 5, accounting for 67 percent and 66 percent of the total. The organization preparedness score was 3.28, accounting for 65 percent of the total. Government Support, on the other hand, had the lowest mean of 3.16, accounting for around 63 percent of the total. Furthermore, the total mean (mean of these values) was 3.26 out of 5 or 65 percent (more than 3). Additionally, the standard deviations (S.D.) for factors range from 0.796 to 1.067, indicating that the data set has a lot of acceptable variability. All variables' descriptive statistics are explained in Table 1.

**Table 1.** Descriptive statistics for all variables

Variable	Code	Mini.	Max.	No. items	Mean	%	S.D.
Security	SU	1.00	4.60	5	3.3554	0.67108	.97025
Relative Advantages	RT	1.00	4.60	5	3.3102	0.66204	.92378
Top management	TM	1.00	4.80	5	3.2325	0.6465	1.0149
Government Support	GM	1.00	5.00	4	3.1616	0.63232	1.0670
Organization Readiness	OG	1.00	4.67	4	3.2898	0.65796	.79661
Behavior Intention	BI	1.00	4.83	6	3.2192	0.64384	.81420
Overall		1.00	4.45	29	3.2610	0.6522	.69621

### 4.2 Assessment of PLS-SEM Path Model Results

As previously stated, SEM has two-stage data analysis method that guides the evaluation of the measurement model and the structural model estimation. The reflective constructs' construct validity, convergent validity, and discriminant validity are all evaluated as part of the measuring model. In this vein, this study followed the two-stage sequential paradigm by applying PLS-based SEM [25]. We examined the measurement model first, then the structural model analysis and hypothesis testing, as recommended by Hair et al., [45].

The evaluation of convergent validity was a critical component of the measurement model. Constructs have an average variance extracted (AVE) of at least 0.5, and composite reliability (CR) measures of internal consistency reliability are above 0.70 and ranged between 0.906 and 0.956, according to [46].

The reliability (Cronbach's alpha) values were greater than 0.70 and varied from 0.866 to 0.940, as shown in Table 2. [45] advised that the AVE of each latent component be 0.50 or higher in order to obtain satisfactory convergent validity. The



AVE values in this investigation were greater than 0.50 and ranged from 0.687 to 0.845, suggesting acceptable values suggesting sufficient convergent validity.

Thus, the convergent validity was confirmed in the study (see Table 2).

### 4.3 Convergent Validity

The factor loading for the items in this study is greater than 0.50, which is acceptable if the study sample size is greater

than 200 people [47]. As a result, convergent validity is sufficiently demonstrated. As a result, all indicators in this study are related to their respective constructs, providing sufficient proof of the model's convergent validity. The convergent validity was confirmed in the study (see Table 2).

**Table 2.** loading of items, Cronbach's alpha, (CR) and AVE

Variables		Loadings	Cronbach's alpha	CR	AVE
Security	SU1	SU1	0.940	0.954	0.806
	SU2	SU2			
	SU3	SU3			
	SU4	SU4			
	SU5	SU5			
Relative Advantages	RT1	0.908	0.937	0.949	0.789
	RT2	0.881			
	RT3	0.882			
	RT4	0.884			
	RT5	0.886			
Top Management	TM1	0.908	0.937	0.952	0.799
	TM3	0.876			
	TM4	0.889			
	TM5	0.895			
	TM6	0.900			
Government Support	GM1	0.919	0.939	0.956	0.845
	GM2	0.914			
	GM3	0.919			
	GM4	0.930			
Organization Readiness	OG1	0.779	0.866	0.906	0.707
	OG2	0.837			
	OG3	0.869			
	OG4	0.879			
Behavior Intention	BI1	0.836	0.904	0.926	0.678
	BI2	0.847			
	BI3	0.851			
	BI4	0.849			
	BI5	0.775			
	BI6	0.777			

#### 4.4 Discriminant Validity

The AVE values for each set of constructs are more than the squared correlations, indicating discriminant validity. Furthermore, for any given construct, the square root of the AVE was more than the value of the square of correlation of that variables with any other factor ( $AVE > \text{correlation square}$ ). The square root of the AVE for all variables with correlations bigger than the correlations between the variables and other variables in the model is shown in Table 3.

**Table 3.** Discriminant Validity for Latent Variables

	AVE	GM	TM	IB	OG	RT	SU
GM	0.677	0.894					
TM	0.684	0.298	<b>0.919</b>				
IB	0.641	0.529	0.458	<b>0.823</b>			
OG	0.675	0.443	0.396	0.780	<b>0.841</b>		
RT	0.710	0.543	0.366	0.558	0.483	<b>0.888</b>	
SU	0.591	0.518	0.383	0.577	0.528	0.432	<b>0.898</b>

The degree to which a construct is actually distinct from other constructs is known as discriminant validity [48]. For every concept that exceeds the squared correlation among other components, discriminant validity is assessed using Average Variance Extracted (AVE) [13].

Relative advantages, government support and top management explained 38.8% of the variance in organization readiness. In addition, security, relative advantages, government support and top management and organization readiness explained 69% of the variance in behavior intention to adopt IB as shown in Figure 2 and Table 4.

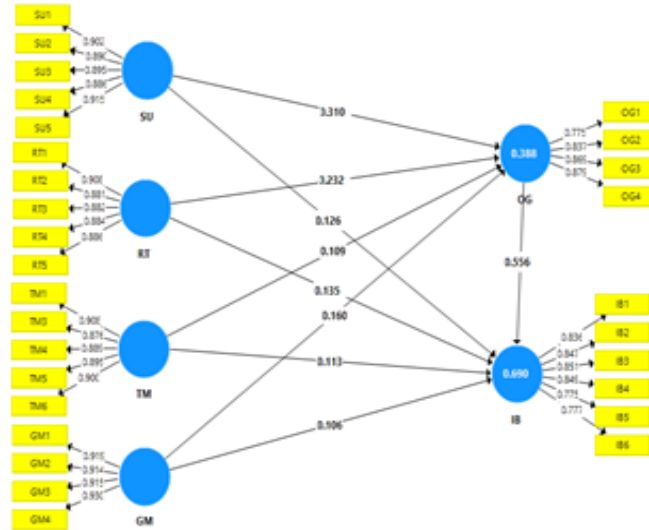


Fig. 2. Measurement Model/Outer loading and (Path Coefficient)

Table 4. Coefficient of determination results R<sup>2</sup>

Exogenous Construct	Endogenous Construct	R <sup>2</sup>	Hair et al. (2017)	Cohen (1988b)	Chin (1998)
SU, RT, TM and GM	Organization Readiness	0.388	Moderate	Substantial	Moderate 1
SU, RT, TM, GM and OG	Behaviour Intention	0.690	Moderate	Substantial	Substantial

Source: Smart PLS Version 3

#### 4.5 Assessment of Effects Size (F2)

The mean of changes in the  $r^2$  reflects the relative effect of a given exogenous variable on an endogenous latent variable [49]. It is determined as the increase in R<sup>2</sup> of the latent variable to which the path is related, divided by the percent of unexplained variance of the latent variable [50].

The effect size ( $f^2$ ) can be calculated using the following formula proposed by [49]:

$$\text{Effect Size } (f^2) = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}} \quad (1)$$

According to [26] an effect size of 0.02 is small, 0.15 is medium and greater than 0.35 is large. Table 5 presents the results of effect size of the exogenous latent variables on endogenous variable with inclusion and exclusion of the mediator.

Table 5. determination Coefficient Results R<sup>2</sup>

Variable	Effect Size $f^2$			
	Organization Readiness	Rating	Behavior Intention	Rating
SU, RT, TM and GM				
Security	0.104	Small	0.031	Small
Relative Advantages	0.057	Small	0.036	Small
Top management	0.012	Small	0.025	Small
Government Support	0.034	Small	0.028	Small

#### 4.6 Direct Hypotheses Results

Security had a significant and favorable impact on organization preparedness ( $\beta = 0.310$ ; C.R = 6.051;  $P = 0.000$ ), indicating that H1 is supported. Following that, Relative Advantages had a significant and favorable impact on SMEs' intention to adopt IB, indicating that H2 is supported ( $\beta = 0.232$ ; C.R = 4.047;  $P = 0.000$ ). Furthermore, top management had a significant and favorable influence on organization preparedness ( $\beta = 0.109$ ; C.R = 1.999;  $P = 0.047$ ), as did government support for IB adoption by SMEs in Yemen ( $\beta = 0.160$ ; C.R = 2.872;  $P = 0.005$ ), hence H3 and H4 are supported.

Alternatively, the outcomes of the research show security and relative advantages had a significant and positive effect on intention towards IB adoption. Thus, H5 and H6 are supported.

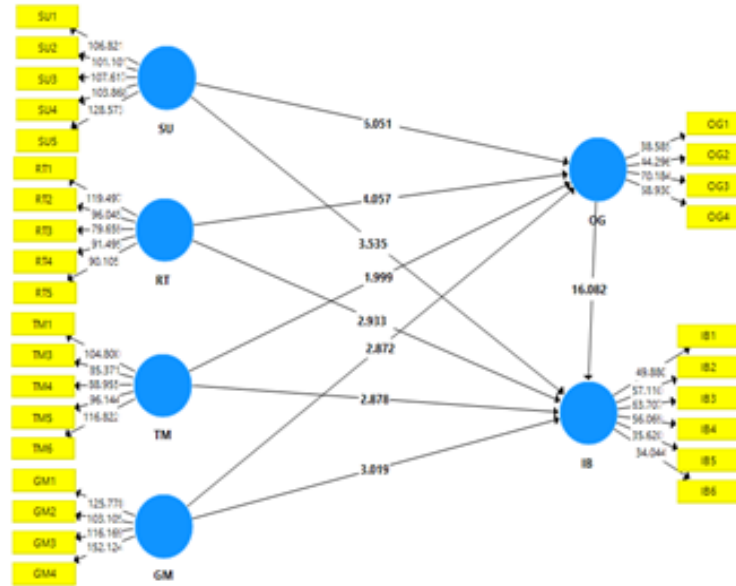
Furthermore, top management had a positive significant impact on SMEs' intention to use IB ( $\beta = 0.113$ ; C.R = 2.878;  $P = 0.004$ ), and government assistance had a positive significant impact on SMEs' intention to use IB in Yemen ( $\beta = 0.113$ ; C.R = 2.878;  $P = 0.004$ ). This H7 and H8 can be used. Finally, organizational readiness had a large favorable impact on behavior intention to adopt IB ( $\beta = 0.556$ ; C.R = 16.08;  $P = 0.00$ ). The structural model's direct hypothesis outcomes are shown in Table 6.

**Table 6.** Summary of Structural Model Assessment (Direct Hypotheses)

H	Exogenous Variables		Endogenous Variables	Estimate (path coefficient)	S. D	C.R (t-value)	P-value	Hypothesis Result
H1	Security	→	Organization Readiness	0.310	0.051	6.051	0.000	Supported
H2	Relative Advantages	→	Organization Readiness	0.232	0.057	4.047	0.000	Supported

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H3	Top management	→	Organization Readiness	0.109	0.039	1.999	0.047	Supported
H4	Government Support	→	Organization Readiness	0.160	0.056	2.872	0.005	Supported
H5	Security	→	Behavior Intention	0.126	0.036	3.535	0.001	Supported
H6	Relative Advantages	→	Behavior Intention	0.135	0.046	2.933	0.004	Supported
H7	Top management	→	Behavior Intention	0.113	0.039	2.878	0.004	Supported
H8	Government Support	→	Behavior Intention	0.106	0.035	3.019	0.003	Supported
H9	Organization Readiness	→	Behavior Intention	0.556	0.035	16.08	0.000	Supported



**Fig. 3.** Structural Model with results of Hypotheses

#### 4.7 The Mediating Role (Indirect Hypotheses Results)

The study conducted a mediation analysis by applying SEM using (PLS) to detect and estimate the mediating effect of training outcome between nature of training, management involvement in training, motivation management, management confidence, management culture and firm performance.

The indirect influence of an independent variable on a dependent variable is measured using a mediator in a mediation test. The mediation test in this work was based on a PLS bootstrapping strategy, which meant that the hypotheses were examined using the PLS methodology [27]. Management and marketing researchers are increasingly recognizing and accepting of the PLS-SEM approach [45].

The mediating impact in the PLS model was established using bootstrapping analysis in conjunction with the assumptions formulated [45].

Table 8 shows organization readiness (OG) could mediate the link between top management (TM), government support (GM), relative advantages (RT) and security (SU) as exogenous variables and behavior intention (BI) to use IB as endogenous variable. This is due to the fact that the T values for four hypotheses were 1.971, 2.790, 4.063, and 5.761 (all greater than 1.960) and the p-values were 0.049, 0.006, 0.000, and 0.000 (0.05). As a result, H10, H11, H12, and H13 are recommended. The structural model assessment for indirect hypotheses is summarized in Table 7 and Figure 3.

**Table 7.** Summary of Structural Model Assessment (Direct Hypotheses)

Hypotheses	Relation	Original Sample ( $\beta$ )	(STDEV)	T-value	P Value	Result
H10	TM -> OG -> IB	0.061	0.031	1.971	0.049*	Supported
H11	GM-> OG -> IB	0.089	0.027	2.790	0.006*	Supported
H12	RT -> OG -> IB	0.126	0.032	4.063	0.000**	Supported
H13	SU -> OG -> IB	0.173	0.030	5.761	0.000**	Supported

\*\*Significant at Bootstrapping  $p < 0.01$ . \*Significant at Bootstrapping  $p < 0.05$

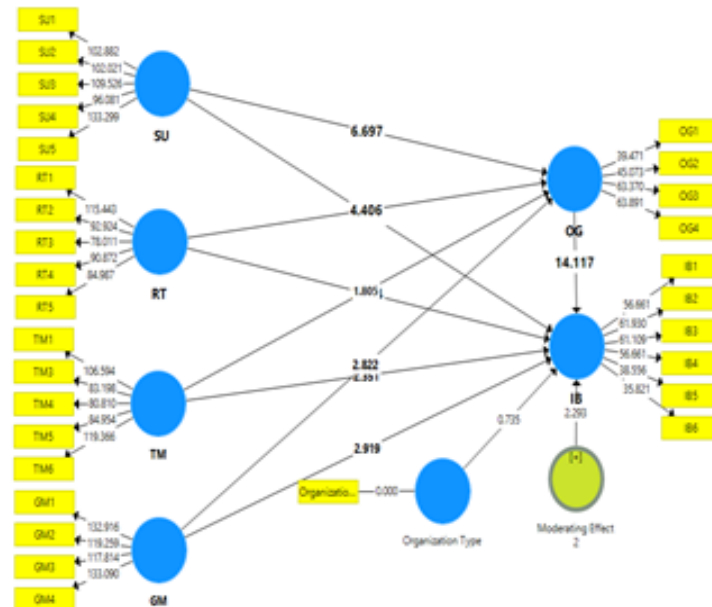
#### 4.8 Modelling Effect (Organization Type)

To investigate the role of the Organization Type (OT) invariance as a moderator between organization readiness and behavior intention to adopt IB a simultaneous analysis of Type organization based on trading and services organization grouping was carried out. The study used interaction effect using PLS-SEM to examine the moderating effect.

The study findings show that the hypothesis H14 is supported; OG\*OT IBA is positively significant. This is because, the path coefficient and t-value were ( $\beta = 0.080$ ;  $t = 2.536$ ;  $p < 0.05$ ). Therefore, organization type is moderator between organization readiness and internet banking adoption. Table 8 and Figure 4 show the result of hypothesis testing for moderating effect (OT).

**Table 8.** Summary of Structural Model Assessment (Direct Hypotheses)

H	Relationship	Path Coefficient ( $\beta$ )	STDEV	t-value	p-value	Result
H14	OG*OT IBA	0.080	0.033	2.536	0.012*	Supported



**Fig. 4.**

use of the combined model in Internet adoption behavior. Furthermore, this study found that organizational readiness played a role in mediating the relationship between TOE characteristics and the intention to implement IB among Yemeni SMEs. Furthermore, the association between organization readiness and BI to adopt IB was modified by the kind of organization. As previously said, the goal of this research is to see if the TOE framework, which was designed in developed countries, can be applied to other non-western cultures or developing countries.

## 5 Implications

### 5.1 Practice Implication

This study makes a significant contribution by statistically confirming the parameters that influence SMEs' adoption of IB. As a result, it is reasonable to assume that SMEs with larger relative advantages, security, top management, organizational preparation, and government support will be more likely to adopt IB.

The importance of organizational preparation as a crucial mediator in the adoption of IB was highlighted in this study. This means that in order to employ IB in their commercial transactions, SMEs must be ready in terms of organizational preparedness. The culture, consistent value, and work methods of the organization are all factors in organizational readiness. Furthermore, this research shows that the environment in which a company operates has an impact on its decision to implement IB. To boost the number of IB users among their customers, banks should focus on TOE aspects.



## **5.2 Managerial Implication**

To reassure their clients that e-banking services are secure, bank executives must increase the security elements of their systems. Putting a greater emphasis on positive safety elements could help to change negative customer opinions. As a result, banks should send a strong message to customers that present security is more than acceptable, allowing them to be rest-assured when using e-banking services. Bank executives must place a greater emphasis on marketing communications in order to widely disseminate the benefits of adopting e-banking. Banks can employ advertising to alter customers' perceptions toward e-banking services, which affects their willingness to utilize it.

## **5.3 Policymakers**

Policymakers must create a priority list of technological, organizational, and environmental elements in order to implement IB adoption based on their organizations' actual capacity and capability. As a result, the Yemeni government should enact regulations and rules to safeguard electronic transactions and promote bank client trust. Furthermore, the study proposes that policymakers, bank executives, and practitioners should focus on maximizing TOE variables, which have been shown to influence and contribute to increasing SMEs' intentions toward IBS experimentally. Additional research might be done because this study does not address all of the factors that influence SMEs' willingness to adopt e-banking services. Other aspects, such as regulatory support, cost, image, or quality of online services, should be studied further. Furthermore, looking into various hypotheses would be extremely beneficial to Yemeni decision-makers and scholars. Comparative studies in other nations with similar situations would greatly expand and improve current understanding.

## **6 Conclusion**

This research might aid bankers in understanding the existing low penetration rate of e-banking and devising strategies to boost e-banking adoption and acceptability by Yemeni SMEs, a nation where e-banking is still regarded an innovation. It also adds to the literature on technology adoption and acceptance, which many researchers have suggested be expanded to new contexts, particularly in terms of the TOE's generalizability and applicability in a new context (online banking), with a new user group (SMEs), and in a new cultural setting (Yemen), which is a critical step in moving a theory forward.

According to the findings, managers and owners should be prepared to deliver financial services via the Internet. Yemeni banks would be able to grow their customer base by offering IBS. Finally, as Internet technology becomes more prevalent and necessary, IB adoption will become increasingly more important. This recommends that managers and owners should devote more time and resources to assisting firms in developing their own skill to integrate IB into organizational functions through training programs.

Furthermore, the report proposes that Yemeni banks should offer specific training, workshops, and seminars aimed at assisting businesses in understanding the requirements for launching an online presence. Furthermore, this investigation contributed to the understanding of technology acceptance within the framework of technology acceptance theories study and, optionally, Internet behavior. The report provides information on the state of IB adoption among Yemeni SMEs and serves as a resource for academics, practitioners, and policymakers interested in encouraging enterprises to embrace IB.

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