

# The Effect of Performance Expectancy, Effort Expectancy, Social influence and Ability on Customers' Acceptance of Internet banking in Sudan

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## Abstract:

Today, people increasingly need banking services. People expect more and faster services with higher quality; so attracting new customers and retaining current ones requires an efficient and effective management at all aspects of banks with emphasis on marketing management. Thus, the purpose of this paper is to investigate the effects of performance expectancy, effort expectancy, social influence, and ability on behavioral intention to use internet banking services in Sudan. Totally, 375 questionnaires were distributed to customers of banks operating in Sudan, 207 questionnaires were collected from customers who are current internet banking users. Structural equation modeling was used to identify the factors affecting internet banking services in Sudan. The results showed that performance expectancy, effort expectancy, and ability had a positive and significant effect on customers' behavioral intention to use internet banking services in Sudan. Whereas, social influence had an insignificant effect on behavioral intention to use. Knowing the factors of internet banking services acceptance could help banking institutions to improve their services to attract more customers. As well as, the use of internet banking services could reduce the crowd to the banks that indirectly reduce air pollution.

**Keywords:** Internet banking services, UTAUT, Ability, Structural Equation modeling (SEM), Sudan

## 1. Introduction:

Nowadays, the internet technology is rapidly changing the design and delivery of financial services. Online services offer consumers a number of information-related benefits that favor adoption. These benefits include the opportunity to control bank accounts at any time and place, the access to personal information for taking investment decisions and the comparison between alternate services (Howcroft et al., 2002) (Maditions, Chatzoudes, & Sarigiannidis, 2013).

Internet banking services (IBS) is defined as "the use of the internet as a remote delivery channel for banking services, and an internet banking is defined as a bank that offers (web-based) transactional services" (Gopalakrishnan, Wischnevsky and Damanpour 2003) (Al-Ajam & Nor,

Predicting Internet Banking Adoption Determinants in Yemen Using Extended Theory of Reasoned Action., 2013). Internet banking is beneficial to both the banks and their customers. From the banks viewpoint, internet banking allows banks to reduce their operation cost through the reduction of physical facility and staffs resources that bank require, reduce waiting time in branches leading to potential boost in sale performances and bigger global reach (Hernando and Nieto, 2007). From the consumers' standpoint, internet banking enables consumers to do a wide range of bank transaction electronically through the bank web-site anytime and anywhere (Granbner-Krauter and Faillant, 2008) (Folake, 2014).

Sudan, similar to my other countries has witness a fast growth of information and communication technology (ICT)

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during recent years which in turn has resulted in fundamental transformations in banking system of this country. Providing such services as ATM, telephone banking, mobile banking, and internet banking to customers

No	Factors	Definition
1	Performance Expectancy	"The degree to which an individual believes that using the system will help him/her to attain gains in job performance" (Venkatesh, Morris, Davis, & Davis, 2003).
2	Effort Expectancy	"The degree of easy associated with the use of the system" (Venkatesh, Morris, Davis, & Davis, 2003).
3	Social Influence	"The degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh, Morris, Davis, & Davis, 2003).
4	Ability	"Described as group of skills, competences, and characteristics that enable a part to have influence within some specific domain" (Mayer et al. 1995) (Okonkwo, 2012).
4.1	Internet Banking Awareness	"refer to the information that the user possesses regarding availability of online banking, range of services, process of signing up and benefits and risks involved" (Sharma & Govindaluri, 2014).
4.2	Accessibility	"Accessibility is defined as the ease with which individual can locate specific computer system (such as an internet banking services)" (Chandio, 2011).
4.3	Internet Connection Quality	"Defined in terms of speed and continuity, can influence user's perception of the behavioral intention to use IBS" (Shathye, 1999) (Sharma & Govindaluri, 2014).
4.4	Internet Banking Cost	"This is one of the major factors that influence customers' adoption of innovation" (Aliyu, Rosmain, & Takala, 2014).

are considered as some results of this transformations. But in this context, one of the main concerns of technology

management particularly in e-banking field is acceptance of it by target groups. If technology is not used, it cannot be effective despite all of its technical merits and capabilities, thus the issue of acceptance of technology by people has drawn significant attention (Change, I. C., H. G. Hwang and Y. C. Li, 2007) (Ghalandari, 2012). Understanding the reason for acceptance or non-acceptance of new technologies by people is one of the greatest challenges (Davis, F. D., R. P. Bagozzi and P. R. Warshaw, 1989) (Ghalandari, 2012).

Thus it seems that decision makers from financial organization initially require understanding factors encouraging users to exploit IBS instead of referring to traditional methods in a current way. According to the above mentioned, present study aims to identify factors influencing customers' acceptance of IBS in banks operating in Sudan. For this purpose, the unified theory of acceptance and use of technology (UTAUT) model was used as the newest and most comprehensive model proposed in this field to answer the question that why some users do not exploit IBS despite availability of them.

## 2. Theoretical Background

### 2.1 Internet banking in Sudan

Sudan's environment faces many challenges in the application of internet banking. Sudan is a country that is just emerging from decades of civil war that has left the country under developed and war torn. Its infrastructure requires a lot of investments into its rehabilitation before it is able to provide online banking in its banking environment. It lacks the necessary technologies to setup internet banking web sites, and to protect it from hackers from all around the world who are a lot more technologically advanced than the banks in our country. Its population has a large number of uneducated people who are not familiar with using the internet, or people who have no access to it. Banks' employees are not trained in the administration of internet banking, and not familiar with its benefits and drawbacks. The telecommunications infrastructure is very poor, and internet servers provide a slow internet connection, and a network that is frequently breaking down (Alam, Magboul, & Raman, 2010).

### 2.2 Users' Acceptance

At the onset, user acceptance is defined as a user's psychological state with regard to his or her intention to use a technology. As behavioral intention to use a technology has proven to be good indicator of actual use in numerous prior studies, (Yeow, Yuen, Tong, & Lim, 2008). This study

use customers' behavioral intention to use IBS to measure user acceptance of IBS in banks operating in Sudan. The construct is measured by three items adopted from (Yeow, Yuen, Tong, & Lim, 2008) (Al-Somali, Gholami, & Clegg, 2009) (Foon & Fah, 2011) (Martins, Oliveira, & Popovic, 2014).

### 3. Research model

For the purpose of understanding the factors influencing customers' acceptance of internet banking in Sudan, this paper proposes a research model (see figure 1. below). This model is developed based on UTAUT model by Venkatesh et al. (2003) with replace facilitating conditions by Ability which includes four dimensions namely internet banking awareness (IBA) adopted from (Al-Somali, Gholami, & Clegg, 2009) (Sharma & Govindaluri, 2014), accessibility (AC) adopted from (Chandio, 2011), internet connection quality (ICQ) adopted from (Al-Somali, Gholami, & Clegg, 2009), and internet banking cost (IBC) adopted from (Yu, 2012). These studies revealed that those factors effecting customers' acceptance of internet banking services in developing countries. The modified UTAUT is showed in figure below, will be named research model.

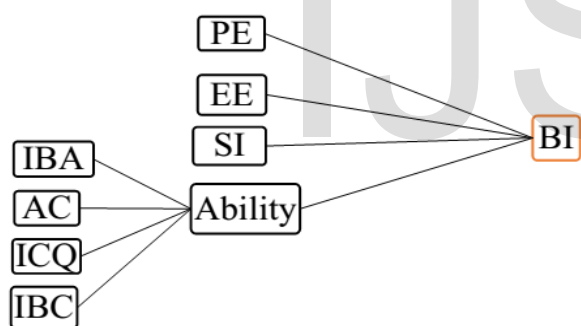


Figure 1: Research Model

In this paper, the bank customers' acceptance of internet banking is measured by their behavioral intention to use this technology. Dillion and Morris (1996) defined user acceptance as a persons' intentions to use a technology. Behavioral intention to use a technology was verified to be a valid and reliable measure of actual usage (Sun, 2003) (Saibaba & Naryana, 2013). Therefore, this study measures customers' acceptance of internet banking through their behavioral intention to use it.

Table 1: significant factors used in this study that influence IB acceptance in Sudan

### 3.1 Research Hypotheses

The following hypotheses are developed based on the research model and literature review discussed:

**H1:** Performance Expectancy has a significant and positive effect on Behavioral Intention to customers' acceptance of Internet Banking services in Sudan.

**H2:** Effort Expectancy has a significant and positive effect on Behavioral Intention to acceptance of Internet Banking services in Sudan.

**H3:** Social Influence has a significant and positive effect on Behavioral Intention to acceptance of Internet Banking services in Sudan.

**H4:** Ability has a significant and positive effect on Behavioral Intention to acceptance of Internet Banking services in Sudan.

### 4. Research Methodology

The research method is descriptive survey. Descriptive survey research includes methods that their aim is describing investigated situations or phenomena. Implementation of descriptive research, can only contribute to the better understanding of the current situation or the decision-making process. Survey is a method to obtain information on attitudes, beliefs, ideas, behaviors, or characteristics about respondents in statistical population through investigation. In survey research, data collection will be conducted by asking individuals who have been selected systematically and have been categorize in sample groups (Samad, 2002) (Delafrooz, Taleghani, Karami, & Moradi, 2013).

#### 4.1 Population and Sample

Population of present research consisted of all customers in the banks operation in Sudan located in Khartoum state, who have an account there, and who have used internet banking service. The sampling method used in this research is simple random sample. Since the size of population in this research is about 12,000 customers, thus according to Sekaran, Uma (2003) the sample size is 375 (Musiiime & Ramadhan, 2011).

#### 4.2 Measurement Instruments

All measurement items were adopted with sight modifications, from the previous studies. Performance expectancy, effort expectancy, social influence, Internet banking awareness, accessibility, internet connection quality, and internet banking cost were measured by four items adopted from (Venkatesh, Morris, Davis, & Davis, 2003) (Al-Somali, Gholami, & Clegg, 2009) (Yu, 2012).

Whereas, accessibility measured by three items were adopted from (Chandio, 2011)

A questionnaire was initially developed in English, based on the literature, and the final version was independently translated into Arabic by a professional translator. All items were measured using five-point likert scales, ranging from strongly agree (1) to strongly disagree (5). Also included demographic questions relating to gender, age, education, marital status, occupation, experience, and income per-month.

### 4.3 Data Collection

Primary data were collected from a random sample of IBS users from the banks operating in Khartoum city. Totally, 289 questionnaires were and after returned were and after conducting all necessary controls 207 were used for data analysis.

### 5. Data Analysis and Results

SEM describes relationships among variables. Although similar to multiple regression in many ways, SEM offers a number of additional benefits including effective handling of multicollinearity. SEM models show relationships among variables using one or more regression equations. The regression equations are called structural equations, and a collection of such equations is referred to as a structural equation modeling. The coefficients describing how dependent variables depend on independent variables are called path coefficient (Sharma & Govindaluri, 2014).

#### 5.1 Respondents' Profile

**Table 2:** shows the frequencies and percentages of respondents

variable	Category	F	%
gender	Male	158	76.3
	Female	47	22.7
Age	Less than 25 years	25	12.1
	25 – 34 years	110	53.1
	35 – 44 years	53	25.6
	45 – 54 years	12	5.8
	55 year and more	5	2.4
Education	Basic	3	1.4
	Secondary School	12	5.8
	Diploma	15	7.2
	Bachelor	111	53.6
	High Diploma	8	3.9
	Master	50	24.2

	Doctorate	7	3.4
Marital Status	Married	107	51.7
	Single	96	46.4
Occupation	Student	12	5.8
	Public Sector	50	24.2
	Private Sector	112	54.1
	Business	24	11.6
	Other: (specify)	5	2.4
Experience	Less than 5 years	64	30.9
	5 years and less than 10 years	65	31.4
	10 years and less than 15 years	46	22.2
	15 years and less than 20 years	11	5.3
	20 years and more	13	6.3
Income per month	Less than 1,000 SDG	22	10.6
	1,000 SDG and less than 3,000 SDG	101	48.8
	3,000 SDG and less than 5,000 SDG	36	17.4
	5,000 SDG and less than 10,000SDG	27	13
	10,000 SDG and more	11	5.3

#### 5.2 Cronbach's Alpha

Data collected were analyzed using Cronbach's Alpha coefficient to check its internal consistency. The Cronbach's Alpha coefficient is commonly used to measure reliability of the questionnaires in surveys. Hair et al. (2006) noted that alpha and construct-reliability values greater than or equal to 0.70 and a variance-extracted measure of 0.50 or greater indicates sufficient scale or factor reliability (Aliyu, Rosmain, & Takala, 2014). Therefore, the Cronbach's Alpha coefficients of the variables were shown in the table 5.2 below. All instruments showed high reliability values (exceeding point of 0.70), which has a good internal consistency, with a Cronbach's Alpha coefficient reported in table 3 below:

**Table 3:** Shows Cronbach's Alpha Coefficient

Variables	Cronbach's Alpha	items
Performance Expectancy (PE)	0.806	4
Effort Expectancy (EE)	0.742	4

Social Influence (SI)	0.876	4
Internet Banking Awareness (IBA)	0.883	4
Accessibility (AC)	0.70	3
Internet Connection Quality (ICQ)	0.832	4
Internet banking Cost (IBC)	0.880	4

### 5.3 Confirmatory Factor Analysis (CFA)

The CFA measurement model estimation is the first step of SEM. The CFA determines whether the number of factors and the loadings of items on them confirm to what is expected based on the pre-established theory of scale assessment. The SEM techniques were used to perform the CFA. The AMOS software 20 was used to calculate whether or not the proposed factor solutions and the model fit. SEM is considered a family of statistics models that looks for details concerning the relationships among multiple variables (Hair, Black, Basin, & Anderson, 2010) (Al-Ajam & Nor, Customers' Adoption of Internet Banking Services: An Empirical Examination of the Theory of Planned Behavior in Yemen, 2013). A confirmatory factor analysis is first used to confirm the factor loadings of four constructs (performance expectancy, effort expectancy, social influence, & ability). The figure 3 and the table 4 below are shows the CFA and Model fit summary respectively that used in this study.

Table 4: structural model fit measure assessment

Goodness-of-fit Measures	Acceptable Level	Structural Model
$\chi^2 =$ Chi-square		620.236
df = degree of freedom		204
$\chi^2/df$	$1 < \chi^2/df < 5$	3.040
Goodness of fit index (GFI)	$\geq 80$	0.886
Root-mean-square error of approximation (RMSEA)	$< 0.05$	0.099
Normal fit index (NFI)	$\geq 80$	0.784
Comparative fit index (CFI)	$\geq 80$	0.841
Adjusted goodness of fit index (AGFI)	$\geq 80$	0.837

From the figure 2 shows that the full structural model results show that there are 4 correlations and 6 covariance achieving stable model fit estimates.

The overall fit measures of the structural model indicate an adequate fit of the model. The standard values were obtained as following:

$\chi^2/df = 3.040$ , GFI = 0.886, AGFI = 0.837, RMSEA = 0.099, NFI = 0.784, CFI = 0.841. The initial confirmatory factor analysis showed a good model fit. As shown in table 4 above all fit indices for the measurement model have achieved an acceptable fit. These findings suggest that the measurement model fit the sample data is acceptable (Al-Somali, Gholami, & Clegg, 2009).

### 5.4 Results of Hypothesis Testing

The table 5: shows that the hypotheses (PE  $\rightarrow$  BI), (EE  $\rightarrow$  BI), and (Ability  $\rightarrow$  BI) are supported which indicated that the performance expectancy, effort expectancy, and social influence has direct effect on the behavioral intention to use internet banking services in Sudan, whereas, (SI  $\rightarrow$  BI), and are not supported. See the table 5 below.

Table 5: shows the results of hypothesis testing

No		Estimate	S.E.	C.R.	P
1	BI $\leftarrow$ PE	.292	.090	3.222	.001
2	BI $\leftarrow$ EE	.233	.098	2.378	.017
3	BI $\leftarrow$ SI	.021	.033	.647	.518
4	BI $\leftarrow$ Ability	.489	.121	4.053	***

## 6. Conclusion

This study has examined the relationship between performance of expectancy, effort expectancy, social influence, ability and behavioral intention to customers'

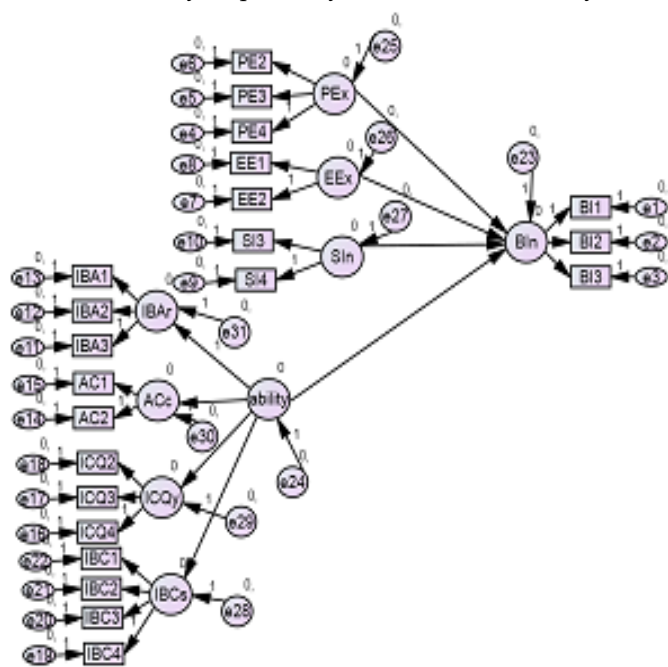


Figure 2: shows the structural model of BI.

acceptance of Internet banking service in Sudan. The results provide evidence for the theoretical model adopting unified theory of acceptance & use of technology (UTAUT). The results support the view that performance expectancy, effort expectancy, and ability are predicting variables for individuals' behavioral intention. They have played a significant role in influencing individuals' intention to adopt Internet banking. These hypotheses were supported. As it is clear from the key fit statistics, the model testing yielded a set of fit indices with an overall well-fit, indicating that the model fitted well with the data. The results of hypothesis testing provide satisfactory support for the UTAUT through the SEM analysis. Overall, the results indicate that the model provides a good understanding of factors that influence the intention to use Internet banking. Approximately, 72% of the total variance on the behavioral intention was explained.

#### 7. Limitations and future studies

There are several limitations in this study. Firstly, this study has examined only the determinants of behavioral intention. Although beyond the scope of this research, future study can enhance the research model, and include the determinants of re-intention or continue of using new technology. Secondly, our research is conducted specifically in Sudan. However, it would be interesting to test this model in other countries and compare the results with this study. Such cross comparison studies would allow us to have a better understanding of the factors that affect Internet banking adoptions. Thirdly, future study can also consider using the demographic variables in this research as control variables and compare the effects with the ones found in the present research.

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