

Perceived Usefulness, Ease of Use, Organizational and Bank Support As Determinants of Adoption of Internet Banking in East Africa

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Abstract

The purpose of this paper to identify the factors that influence corporate customers adoption of Internet banking services in Kenya, Uganda, Tanzania and Rwanda. The hypotheses are empirically evaluated by using Trade Finance customers of an East African bank as the target sample. Technology Acceptance Model (TAM) is the primary basis for the study. The information gathered from former studies that are mainly concentrating on private customer acts as a foundation for building an extension of TAM suitable for corporate customers. The study involved 137 respondents from Kenya, Uganda, Tanzania and Rwanda.

Due to the quantitative nature of the study, the results are analysed with statistical measures. This included the use of SPSS to carry out regression analysis. The analysis reveals that corporate users are not motivated by the same factors as private users. In order to become Internet banking customers, it is extremely important for corporate users to have a system that is easy to use and operate with full support from the bank.

Keywords: Internet Banking, East Africa, Cooperate customers, Quantitative methodology

Introduction

According to Internet World Stats (2000), 5.3 % of the total world population (6,767,805,208) was using the Internet. This means that approximately 360,985,492 people all over the world were connected to each other. Today the situation is very different from that of a couple of years ago. In nine years the amount of Internet users has been increasing by 362.3% (www.internetworldstats.com). These massive figures very well reflect the scope and size of this the network. There is no other channel in the whole world bringing people so close to people, people so close to business or business so close to business than the Internet.

Originally information technology was utilized in back offices for batch data processing, which was something not that obvious to the customers. Consumer oriented innovations became more important during 1980-1995. This time period is called the "diffusion period of the information revolution in commercial banking" (Bátiz-Lazo and Wood, 2002). Mainly this was

possible due to Personal Computers (PC's), which enabled new contacts between banks and customers. But as expected, it didn't end there. After PC's invaded homes and workplaces, customers themselves could start communicating with the bank electronically from their own PC's. The information between customers' PC's and bank's systems did not transfer on-line at that time. Only after emergence of the Internet, banks have been able to provide real-time banking services electronically to a larger audience without a need to install anything on the customer's PC. (Bátiz-Lazo and Wood, 2002)

Historically branches and physical distribution channels have been the very cornerstones to most banks' market success. However, the emerging electronic channels have forced banks to change their entire management approach. Much of this is thanks to the fact that geographical and time restrictions do not limit the use of banking services anymore (Karjaluoto et al. 2002). As long as customers are connected to the Internet, they should be able to use the services when and where ever. The whole banking strategy has changed as a result of this; people are not dependent on the bank having branch closest to them physically, as it used to be. They can choose whichever bank offering its services online - or even several banks to serve different banking needs. This kind of development has shifted banks' attention more from marketing and selling of services and products towards building and managing customer relations.

According to the research done by Devlin et al. (2003), nearly every bank will have online services available by the year 2011. Surprisingly, they found out that small banks have benefited from the emergence of the Internet: Online services help small banks also to strengthen their competitive position. Internet is contributing to making the competition even fiercer in the future, regardless of the size of the organization (Lüneborg and Nielsen 2003). Internet banking has also played a major role in changing the structure and amount of investments made to develop banking systems. Front-end and back-office systems are now designed to support the online service offerings. Online systems and development of the necessary infrastructure and system architecture receive majority of attention and information technology investments today. Providing real time data, and having the customers to key in the data instead of more experienced bank officers, requires also more from the system design. Although, the investments that have been done also seem to pay off, Lüneborg et al. (2003) discovered that banks providing online services experience a significant positive impact on different performance measures: sales, market share, and amount of new established customer relationships. These are all expected to be profitable at some stage of the lifecycle.

Hypotheses

- i. Perceived Usefulness positively influences use of Trade Finance Internet Services in East Africa.
- ii. Perceived Ease of Use positively influences use of Trade Finance Internet Services in East Africa.
- iii. Organizational Support positively influences use of Trade Finance Internet Services in East Africa.
- iv. Bank Support positively influences use of Trade Finance Internet Services in East Africa.

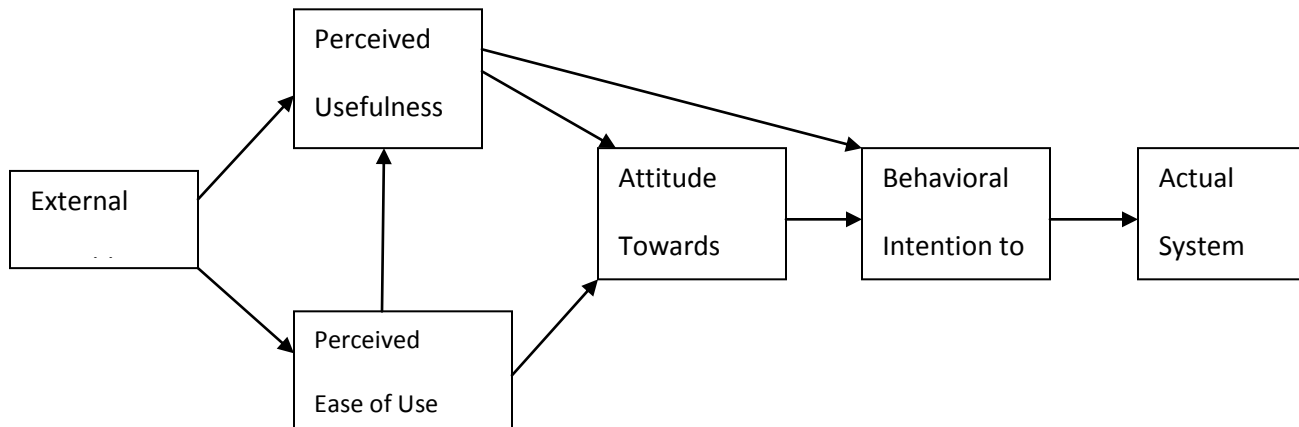
Literature Review

Technology Acceptance Model

Technology Acceptance Model (TAM) was initially suggested by Fred Davis in 1989. It is one of the most studied and used models in the investigations of user acceptance of information technology. The model is adapted from Theory of Reasoned Action (TRA), which was originally proposed by Fishbein and Ajzen in 1975. Technology Acceptance Model is an information system theory, which purpose is simply to predict and explain the user acceptance of information technology. The model addresses the reasons why users either accept or reject particular piece of information technology. The revised model by Davis et al. (1989) is constructed from external variables (external stimulus), perceived usefulness and perceived ease of use (cognitive response), behavioral intention, and actual usage (behaviour). (Davis et al. 1996a).

Original Technology Acceptance Model

This figure is a description of the original TAM by Davis.



Source:- (Davis, 1989)

Figure 1 Original Technology Acceptance Model

The fundamental idea of the theory is that perceived usefulness and perceived ease of use influence the users' intention to use information technology either directly or mediating via attitude towards the behaviour, leading to actual usage of the system. Attitude Towards (AT) and Behavioural Intention (BI) are common with the Theory of Reasoned Action. Perceived ease of use (PEOU) has a strong influence on AT through perceived usefulness, but also directly. Perceived Usefulness (PU) has a strong direct influence via both AT and BI.

PU was defined as "the degree to which a person believes that using a particular system would enhance his or hers job performance". "A system high in perceived usefulness, in turn, is one for which a user believes in the existence of a positive use-performance relationship". PEOU was described as "the degree to which a person believes that using a particular system would

be free from effort". (Davis, 1989). The original TAM was revised by leaving attitude from the model, as empirical validation proved that intention to use is only partly mediated by attitude (Davis and Venkatesh. 1996a).

Technology Acceptance Model And Internet Banking

Quite a few researchers have applied TAM when studying acceptance of Internet banking. Liao et al. (2002) even made an invariance analysis concluding that TAM is a well suitable instrument for evaluating Internet banking acceptance, but also that the suitability is independent of the respondent characteristics such as gender, age and information technology competence. The current research done about Internet banking and Technology Acceptance Model are reviewed next, presenting the major findings of them and the empirical environment.

Sudarraj et al. (2005) used deconstructed TAM to measure the importance of usefulness and ease of use in online and telephone banking. They successfully validated the model with Canadian university students. Karjaluoto et al. (2002) built a model based on TRA and TAM, which was empirically tested with private Finnish retail bank customers. Their conclusion is, that "prior computer experience, prior technology experience, personal banking experience, reference group, and computer attitudes strongly affect attitude and behaviour towards online banking" (Karjaluoto et al., 2002).

Supporting findings were those of Lassar et al. (2005) who studied online banking adoption in the United States in the light of TAM. They concluded that the intensity of Internet usage is significantly influencing individuals' adoption of Internet banking. These findings suggest that the more experienced the consumers are in using the computers and the Internet, the more likely it is that they will start using Internet banking.

Another Finnish study investigated consumers' acceptance of online banking: Pikkarainen et al. (2004) added perceived enjoyment, information on online banking, security and privacy and quality of Internet connection to the model. Surprisingly, they found only PU and information of online banking significantly affecting use of Internet banking services in Finland. Hong Kong students were used to empirically test another modification of TAM; in this study Chau and Lai (2004) also discovered that PU could be the only major factor directly influencing the attitude towards online banking. PEOU influenced also directly, but mainly via PU. Other measured factors like alliance services, personalization and task familiarity influenced through PU, and accessibility through PEOU.

Suh and Han (2002) added trust to the original TAM model. They studied their model by empirically evaluating responses from personal customers of five major banks in South Korea and discovered trust to be a very significant determinant of user acceptance of Internet banking. Eriksson et al. (2004) made the same conclusion while studying the meaning of trust with Estonian private customers. Trust had a significant positive effect on both PEOU and PU, out of which PU appeared to be stronger in predicting the intention to use Internet banking.

Trust was handled also by Wang et al. (2003). Their research aimed on recognizing the determinants of user acceptance of Internet banking. In this research they introduced perceived credibility as a new factor to TAM, in addition to self-efficacy, perceived usefulness and perceived ease of use. The model was empirically tested by phone interviews with Taiwanese consumers. Surprising results were found: perceived ease of use and perceived credibility were more significant than perceived usefulness in predicting the behavioural intention to use Internet banking. The surprising factor in this was, that majority of TAM related research has concluded that PU is the ruling factor over PEOU. Self-efficacy.

Methodology

Research Population

The researcher targeted population was business process in the organization, corporate Customers, Current system if any, Capability of the organization's technology infrastructure and the management of the organization

Research Instruments

Quantitative analysis was chosen to test the research model, as it is good for measuring how many and in what proportion. In addition, with statistically reliable quantitative research it is possible to generalize the results: if the same questions are asked from different people with the same characteristics, the answers should support the outcome of the study.

The method for collecting empirical data for the statistical analysis was customer survey. Questionnaires were sent out to randomly selected Trade Finance customers of the case bank; (Kenya Commercial Bank) in Kenya, Uganda, Rwanda and Tanzania. The questionnaires were developed together with this banks best Trade Finance specialists. With the help of the expertise of these specialists, the questionnaire content and validity of the questions were confirmed to facilitate achieving the goal of the study in the best possible way. In addition the questionnaires contained questions outside of this research, mainly related to customer service and open-ended comments. The responses to those questions are used for further analysis only for the case bank's purposes.

Data Analysis Method

The analysis was done with a system designed for statistical analyses (SPSS). Descriptive statistics and regression analysis, completed with Pearson product-moment correlation analysis, were selected as the methods for interpreting and analysing the empirical data. With the help of these statistical measures, the validity of the theoretical model and hypothesis are tested.

Regression analysis was chosen, for it fits well for hypotheses testing and analysing how independent variables can be used to predict a dependent variable. Linear regression is based on correlation between the variables, in this case Pearson product-moment correlation, but it

enables more detailed and sophisticated examination of the interrelationship of the variables.

Fitness of the model built for this study is examined by this kind of standard regression analysis. The analysis shows how much of the total variance in the dependent variable (use of the system) is possible to explain by the independent variables; perceived usefulness, perceived ease of use, self-efficacy, previous experience, awareness, organisational support, and banks support (Pallant, 2001).

Analysis called ANOVA is conducted in order to determine the statistical significance of the correlations between the selected variables. The p-value of the F-test indicates the level of association between the dependent and independent variables in the model. When the significance p-value is less than 0.05, it means there is a statistically significant association between the dependent and independent variables. P-value 0.10 refers to weakly significant association. If the p-value is more than 0.10, then the model chosen is not statistically significant.

Analysis of Findings

Data Analysis

In total 472 customers were included in the survey, of which 137 (29 %) replied. 19 responses were disqualified due to missing answers. In total the response rate for the survey was 25%. Proportionally Kenyans were most active in answering, resulting in 47 % response rate. All of the returned answers were qualified in the research. The second best result was achieved in Uganda (35%) with the most answers qualified (55, response rate 33%). The answers received in Tanzania and Rwanda reached only somewhat over 20% response rate, resulting in less than 20 % of qualified answers (14 % and 17 %). However, the amount of individual answers included in Kenya and Tanzania was almost the same, 24 and 25 respectively. In Rwanda only 14 answers were qualified to be included in the survey.

The final sample size of the analysis is 118 out of which Rwanda covers 11,86%, Uganda 46 %, Tanzania 21 %, and Kenya 20%. 107 of the sample are users of the system, while only 11 represent non-users. From Kenya only users of the system responded to the survey, which makes the result analysing somewhat difficult for Kenyan respondents, as non-users are missing from the sample. Table 1 contains the response statistics per country, it shows tabular representation that compares response that were valid and percentage of the respondents per country it also compares total number of response that were received and the ones that were valid for inclusion in the data analysis per country.

Table 1. Response statistics per country

NATION	SENT	RECEIVED	%	VALID	%
Rwanda	81	17	20.99	14	17.28
Uganda	166	58	34.94	55	33.13
Tanzania	174	38	21.84	25	14.37
Kenya	51	24	47.06	24	47.06
Total	474	137	29.03	118	25

Use Of The System

Most of the responses came from users of the system (90%). Customers, who do not currently use the system, but reported that they will in the future cover 7%. Only 3% of all responses came from customers who do not use the system, and do not intend to. All Kenyan customers were users of the system, and also in Uganda only one of the responses came from a non-user. The most non-users were registered from Rwanda (36%). This can probably be explained by the distinct difference in TFIS between Rwanda and the other countries.

Table 2 User statistics

Usage	Frequency (%)
Don't Use and Won't	3
Don't Use but will	7
Users	90

T-tests

An independent T-test was conducted to compare the scores for each of the variables between users and non-users, females and males, older and younger, and between those with higher and lower education.

Differences Between Users And Non-Users

A t-test was conducted to compare the outcomes for each of the variables between users and non-users. Table 3. contains the outcome for this test.

Table 3. T-tests between users and non-users

	Mean		Levene's Test for Equality of Variances		t-test for Equality of Means
	Non-user	User	F	Sig.	Sig. (2-tailed)
PU	4.10	4.27	1.445	0.232	0.555
PEOU_1	3.56	3.97	0.197	0.658	0.185
PEOU_2	3.22	4.01	0.074	0.786	0.011
OSU_1	2.80	2.63	0.080	0.777	0.688
OSU_2	3.20	2.96	0.171	0.680	0.582
BSU_1	3.83	4.56	0.987	0.323	0.001
BSU_2	3.55	4.54	1.143	0.287	0.000

* *F-value for Equal variances assumed was lower than 0.05. Therefore values for equal variances not assumed are used.*

As can be seen from the table above, both users and non-users find the system useful. Non-users seem to be more aware of using the system, and have more confidence on them when it comes to using it. Non-users also have more experience on using other bank services provided in the Internet. For non-users organisational support is more important. The only variables that are statistically significant between users and non users are PEOU_2 and BSU_1 and BSU_2 ($p < 0.05$). These three are all scored higher among the users. The finding about bank support is also in line with the regression analysis results for the adjusted model.

Differences Between Females And Males

A t-test was conducted to compare the outcomes for each of the variables between females and males. The results of this comparison can be seen in table 4.

Table 4. T-Tests Between Males And Females

	Mean		Levene's Test for Equality of Variances		t-test for Equality of Means	
	Female	Male	F	Sig.	Sig.	(2-tailed)
PU	4.29	4.18	1.036	0.311	0.561	
PEOU_1	4.10	3.53	0.896	0.346	0.002	
PEOU_2	4.06	3.65	0.866	0.354	0.027	
OSU_1	2.70	2.52	2.396	0.124	0.503	
OSU_2	2.99	2.97	0.491	0.485	0.942	
BSU_1	4.56	4.29	2.643	0.107	0.077	
BSU_2	4.54	4.21	3.263	0.074	0.049	

Based on the T-test results, there is statistically significant difference between the scores of males and females in Perceived Ease of Use and Bank Support. Both PEOU_1 and PEOU_2 have received higher scores by the females. Both BSU_1 and BSU_2 are statistically significant: BSU_2 somewhat more strongly (p-values<0.01 and P<0.05 respectively). Hence, females think the system is easier to use than males, but to them the importance of support received by the bank is bigger than for males – especially technical support. That is not very surprising if traditional roles and areas of interest are considered; men in general tend to be more self-assured about technical matters.

Differences Between Age Groups

A t-test was conducted to compare the outcomes for each of the variables between respondents of different ages. They were divided into two categories: respondents between 24-45 years and 46-65 years. The results of this comparison can be seen in table 5.

Table 5. T-tests between Age Scales

	Mean		Levene's Test for Equality of Variances		t-test for Equality of Means	
	24-45 years	46-65 years	F	Sig.	Sig. (2-tailed)	
PU	4.28	4.20	0.188	0.665	0.622	
PEOU_1	3.97	3.91	1.417	0.236	0.721	
PEOU_2	3.94	3.98	1.270	0.262	0.843	
OSU_1	2.67	2.56	0.145	0.705	0.656	
OSU_2	2.94	3.00	0.436	0.510	0.819	
BSU_1	4.51	4.43	0.066	0.798	0.599	
BSU_2	4.60	4.18	5.181	0.025	0.009	

According to the T-test between respondents of age 24-45 and 46-65, there is statistical significant difference in variables EXP_1 and BSU_2. The results indicate that the older the users are, the more experience they have in other Internet bank services and the less technical support they need from the bank. This is surprising when considering the common impression that younger are more familiar with electronic banking services, which also has been supported by empirical results in few of the studies (Akinci et al. 2004, Karjaluoto et al. 2002).

Differences Between Education Levels

A t-test was conducted also for comparison of scores for each of the variables between respondents with different education levels. They were divided into two categories: respondents with elementary school, high school education, and those with university bachelor's or master's degree. Table 6 contains the comparison results.

Table 6. T-Tests Between Low And High Educated

	Mean		Levene's Test for Equality of Variances		t-test for Equality of Means	
	Lower education	Higher education	F	Sig.	Sig. (2-tailed)	
PU	4.37	4.19	1.347	0.248	0.315	
PEOU_1	4.00	3.96	0.938	0.335	0.806	

PEOU_2	3.95	4.00	0.586	0.446	0.782
OSU_1	2.65	2.62	0.393	0.532	0.897
OSU_2	3.10	2.91	0.667	0.416	0.469
BSU_1	4.61	4.41	1.068	0.304	0.186
BSU_2	4.54	4.390	0.083	0.774	0.390

The T-test results indicate that there is a big difference in previous experience. Similarly surprising results can be seen with the education level of the respondents, as with the age and use of Internet banking of females: Clearly the higher the level of education, the less experience the respondent has with both Internet banking and other Internet services.

Again the common understanding and empirical evidence from studies done before do not support this notion.

Differences Between Nationalities

In order to distinguish the differences between Kenyan, Ugandan, Tanzanian and Rwandan respondents, a t-test was also made to compare the scores of each of the variables. The analysis of the countries and the differences of scores were done by pairing the countries for the analysis. This approach was chosen to see the differences in more detailed. Means per country are presented in table 7, and t-test results in table 8.

Table 7. Mean Values For Kenya, Uganda, Rwanda And Tanzania

	Mean			
	RWANDA	UGANDA	TANZANIA	KENYA
PU	4.54	4.20	4.05	4.42
PEOU_1	4.00	3.84	3.78	4.29
PEOU_2	3.77	4.02	3.70	4.13
OSU_1	2.75	2.62	2.96	2.33
OSU_2	3.17	2.81	3.17	3.08
BSU_1	4.14	4.62	4.00	4.88
BSU_2	4.36	4.57	3.92	4.75

Table 8. T-tests between Kenya, Uganda, Rwanda and Tanzania

Levene's Test for Equality of Variances and t-test for Equality of Means												
	RWANDA-UGANDA		RWANDA - KENYA		RWANDA-TANZANIA		UGANDA - KENYA		UGANDA-TANZANIA		TANZANIA - KENYA	
	F	Sig. (2-tailed)	F	Sig. (2-tailed)	F	Sig. (2-tailed)	F	Sig. (2-tailed)	F	Sig. (2-tailed)	F	Sig. (2-tailed)
PU	1.056	0.262	0.255	0.616	0.347	0.074	3.443	0.337	3.567	0.531	0.115	0.083
PEOU_1	0.102	0.558	0.863	0.341	0.269	0.494	0.521	0.039	0.097	0.810	0.143	0.054
PEOU_2	0.874	0.354	0.011	0.247	0.091	0.831	1.289	0.609	2.329	0.154	0.259	0.123
OSU_1	2.462	0.749	2.998	0.387	0.014	0.587	0.663	0.381	4.394	0.267	4.696	0.100
OSU_2	1.345	0.376	8.810	0.875	0.004	1.000	7.151	0.431	2.051	0.240	12.841	0.837
BSU_1	5.312	0.018	14.732	0.001	0.823	0.624	12.620	0.068	0.197	0.000	4.657	0.000
BSU_2	0.204	0.342	1.438	0.123	0.611	0.167	1.735	0.306	2.674	0.002	3.924	0.002

When looking at the table 8, several small statistically significant differences can be distinguished from the T-test results: Variable Awareness is statistically significantly lower in Uganda than in Rwanda and Kenya. Experience in other Internet services is significantly different among Rwandans and Tanzanians and Rwandans and Kenyans.

Although all the countries value support from the bank in both non-technical (BSU_1) and technical (BSU_2) issues, there is clear statistical difference between Kenyans, Ugandans and the other countries. Especially Tanzanians give the lowest scores to both: M=4.00 and M=3.92 respectively. Especially score for the technical support is significantly lower than it is for

Kenyans and Ugandans. Rwandans do not see non-technical support as important as Kenyans and Ugandans either.

Tanzanians and Rwandan corporate customers obviously do not value support from the bank as much as Kenyans and Ugandan customers do. Therefore it is good to keep in mind that most of the respondents of this research were from Uganda and Kenya. However, none of the nations seem to demand much of support from their own organisations. In general, Rwandans are the least experienced, and Ugandans have the least confident and lowest level of awareness of the system usage.

Summary

Several different methods were used to analyse the empirical results gathered from case bank's randomly selected corporate customers using Trade Finance services. In order to find out the factors that influence corporate customers' adoption of banks' Internet services, a case of Trade Finance Internet Services was utilized. Customers from four East African countries were included: Kenya, Uganda, Rwanda and Tanzania. In the following table 9 the results of all the statistical analysis are summarised.

Table 9. Hypothesis summary

Hypothesis	Regression analysis		T-test	Pearson moment correlation Analysis	Product- correlation
	Original model	Adjusted model			
H1	Rejected	Rejected	Rejected	Rejected	
H2	Rejected	Supported	Supported	Supported	
H4	Rejected	Supported	Supported	Supported	
H3	Rejected	Rejected	Rejected	Rejected	

As can be seen from the table above, the original model with 7 independent variables measuring use of the system was found statistically insignificant. However, after adjusting the model based on the coefficient information from the original model and some tryouts, two hypothesis were found statistically significant: H2 – Perceived Ease of Use (PEOU) positively influences use of TFIS and H4 – Banks Support (BSU) positively influences use of TFIS. The analyses were continued with T-test analysis and Pearson product-moment correlation analysis. All of these confirmed the statistical significance of PEOU and BSU. However, no other hypothesis held for the corporate customers, which is not in line with the findings of several previous studies made.

Recommendations & Future Research

This study makes significant contributions to knowledge in relation to customers' perception of factors affecting Internet banking adoption. Furthermore, it also provides an insight into the customers' needs and wants which may be essential for bankers in order to provide better services to customers. In the light of these findings, several recommendations were made which may be useful for bankers and other related authorities.

Banks should make their customer more aware of their new products or services, in this, Internet banking, to encourage higher adoption rate. They can do so by having seminars, exhibitions or giving free-trial periods to allow customers to evaluate their new inventions. Besides that, education and publicity through mass media will also prove to be effective.

Banks should offer both technical and non technical support to their corporate customers as this is proved to be one of the most essential factor that influences corporate customers to adopt internet banking services.

The researcher also recommend that banks take security of their Internet banking sites into serious consideration since fraud and websites hacking still haunt most of the customers. Perhaps they can implement more advanced encryption methods and build stronger firewalls to prevent security infringement. Government authorities like Central Bank of Kenya (CBK), Bank of Uganda (BOU) and Bank of Tanzania (BOT) can also play their role by issuing statements which reassure customer that the government recognizes Internet banking as secure.

Internet banking sites should be made as user-friendly as possible as not many consumers are familiar with computer and the Internet, especially the older and uneducated generation. Providing online help and giving customer the choice of their preferred language will ease their transactions.

If possible, banks should not charge customer for their Internet banking services. This is because users have to incur other costs. However, if this does not appear to be feasible, they would have to make sure that the costs of transacting manually does not exceed the costs of Internet banking.

Despite all the frenzy about Internet banking, bank should not neglect their branch networks. Although these branches will play fewer roles in the future, they will still be needed in selling products and services where face-to-face communication is vital. Besides that, they are the only options of cash withdrawals and deposits.

Suggestions For Further Research

The researcher suggestion is to conduct a research with corporate customers and Trade Finance Internet services with a larger and more versatile target group. More non-users should be

involved in the study, and other corporate banking areas where different transactions are in question.

Interesting is also do individuals see Internet banking in a very different way, depending on if they are doing transactions for themselves, or for the employer. A comparison between ones thoughts regarding private Internet banking and Internet banking for work purposes as a corporate user could reveal something interesting.

In addition a wider comparison between the countries should be conducted. A deeper analysis related to the demographics and background of the users would be beneficial in order to discover how they influence corporate customers decision-making and use of Internet banking.

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