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ISSN: 2394-4404

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Abstract: The banking sector in Ghana has seen a tremendous development in information and communication technology in respect to the conduct of its operations. This technological advancement in banking operations has had an impact on the products and services offered to customers. The birth of Telephone banking, Electronic Funds Transfer at point of sale (EFTPos), Internet Banking, and the Automated Teller Machine; which was the focus of this study, are a few of the technologically improved products and services of this era. The sample size was drawn from Barclays Bank, Koforidua branch. A 'grab sampling' technique was used to select the customers from the bank. Findings from the research show that the introduction of information technology into banking operations in Ghana has not only improved the quality of service being rendered to its customers, but has also reduced the operational cost of the company under review. It was also found out that the lower cost of operations has reflected in profit maximization. Some recommendations made were that, regular and routine maintenance should be carried out to ensure a smooth running of the system.

Keywords: E-Banking, ATM, Telephone Banking, Barclays Bank, Customers.

I. INTRODUCTION

The evolution of electronic banking (e-banking) began with the use of the Automated Teller Machine (ATM) and Finland is credited with the accolade of being the first country in the world to have taken the lead in e-banking. Banking in Ghana has evolved from a manual system of operations to a more technologically improved state in their service delivery aimed at improving the quality of service being provided to the customers. Barclays Bank Ghana has a worldwide reputation for delivery of customer services. The bank on the 14th of February 1917 was established as Barclays Bank DCO (Dominion Colonial Overseas) which was changed to Barclays Bank of Ghana Ltd in 1971, Barclays Bank Ghana is now a wholly owned subsidiary of Barclays Bank PLC in the United Kingdom. Barclays Bank of Ghana Limited has an extensive retail and corporate banking network in the country, comprising 67 branches, 8 agencies, 10 Premier life Centers, 2 Premier Suites and 8 local business centers. The bank was also the first to introduce cash accepting ATM service for its customers in Ghana, thus providing the ATM machine the added value of conducting almost all the banking services needed by a customer, which eventually means the customer can do any bank transactions without having any face-to-face interactions with any person. If we thought that was the end of the capabilities of technology regarding the ATM usage, we were wrong, as Barclays Bank again with the aid of technology introduced on the 30th of January, 2014, a card less ATM service, which allows customers to access money from the ATM even without an ATM card. This innovation goes to cement the fact that, there is no stopping technology in making the banking industry less stressful for the valued customers of the bank (Boateng and Molla (2006).

Electronic Banking in the context of this research would be limited to the use of Automated Teller Machines (ATMs). With the ever increasing standards that are set by banks in the more technologically advanced countries of the world on a rapid pace in terms of development, Ghanaian banks have found it as a matter of necessity to stay technologically close as possible. Electronic banking integrates and aligns the Ghanaian economy globally. Simply put, electronic banking makes banking easy, faster, saves time, cost effective and increases customer satisfaction.

As with every good innovation, comes some shortcomings and electronic banking has not been spared. These challenges include;

- ✓ Customers' access to ATMs not always assured the machine is either faulty or short of money for transaction.
- ✓ Network problems resulting in the inability to access information resulting in an abstract end to providing services to customers.
- ✓ Complexity in the use of some of the electronic tools which acts as a turn-off for some customers.
- ✓ Security as with every system comes people who would try and sometimes succeed to circumvent the system for illegal purposes. Electronic banking faces such a challenge.

The immergence of IT has had a positive effect on bank productivity, cashiers' work, banking transaction, bank patronage, bank services delivery, customer service and bank services. In conclusion, IT has positively affected the growth of banking (Yasuharu, 2003).

Therefore this research is aimed at ascertaining the impact of electronic banking transaction on customer satisfaction in the banking industry in Ghana taking Barclays bank Koforidua branch with an emphasis on the ATM, as the case study.

A. STATEMENT OF THE PROBLEM

Daniel (1999) states that, as compared to ordinary banking system, electronic banking provides a competitive advantage in that it lowers cost and provides best satisfaction for customer needs. Singh and Malhotra (2004) also re-iterated that electronic banking provides convenience in that it gives a 24/7 access and does not limit customer to banking operation hours. Banking in Ghana, is not left out of this phenomenon, as it has relied on technologically advanced services like the ATM to lure and increase customer satisfaction and loyalty. This has resulted in the banks operating even after official working hours and providing their customers with an unrestricted access to their banking needs. Despite the usefulness of electronic banking to organization and their customers, it has several challenges which serve as a set-back to both parties. Empirical evidence attest to the fact that customer patronage for a particular product is dependent on the level of understanding of what the product can do and what they stand to benefit from that product.

This research therefore seek to investigate the impact of e-banking on customer satisfaction and to explain the problem listed by other researchers in the particular study area, to see the relationship of e-banking variables listed by other researchers which determine customer satisfaction in ebanking. And the researcher believes that no study has been done on this specific topic in Koforidua to provide empirical evidence of the impact on customer satisfaction of e-banking.

B. OBJECTIVES OF THE STUDY

The general objective is to ascertain whether electronic banking has been beneficial in satisfying customers or has rather compounded in making banking stressful for the customer.

The specific objectives are; To compare the level of convenience between transactions using the ATMs and the banking hall; To identify the age, gender, occupation and educational status in relation to ATM usage. To assess the level of training given to staff who operate the ATM; To identify the problems encountered by customers in the use of the ATM; To evaluate the cost incurred to the business in operating the ATM vis-à-vis to going manual.

II. LITERATURE REVIEW

A. TRADITIONAL (MANUAL) BANKING SYSTEMS

A layman definition of Traditional banking can be said to be the process of receiving, recording, processing, posting and delivery of accounting information on customers of banks without the use of any mechanized, computerized or any electronic device. The phenomenon of Computerized banking system became common over the following decades as bankers saw the need that they can save lots of time and labour by automating the banking processes.

a. TRADITIONAL BANKING

A research by Adam (1999) showed that traditional or manual banking is the execution of the activities of banking such as borrowing, transfer, keeping of cash without the use of any electronic assorted device. In manual banking, the banker keeps records on customers in bulky books with hand writing.

This system of banking, was commonly associated with a lot of errors in the cause of service delivery coupled with the fact that it was time-wasting and made work quite stressful and difficult thereby making customers lose interest in transacting business with the banks and rather take the obvious option of keeping their own cash. This system did not spare employees too as it puts a lot of pressure on them since its takes more time to finish serving one customer before moving to the next. In addition, based on what was said by the two writers it is the fact that customers of banks were only restricted to transacting business within their main branches, thereby posing problems to customers who usually travel to other places to do business, thereby causing a lot of inconvenience for customers and affecting their business.

B. THE CONCEPT OF ELECTRONIC BANKING

Daniel (1999) explains e-banking as the provision of banking services to customers through internet technology. However, (Singh and Malhotra, 2004) defines e-banking in a more comprehensive way as the deployment of banking services and products over electronic and communication network directly to customers. Products and services are delivered through electronic and communication networks such as ATMs, the Internet, mobile devices and telephones. Among these technologies, the increasing penetration of personal computers, relatively easier access to the internet and a wider diffusion of mobile phones has drawn the attention of most banks to e-banking (Boateng and Molla, 2006). Stamoulis et al. 2002, on the other hand consider e-banking as a financial innovation that has been enabled by the creative use of emerging ICT and other business forces. The financial innovation incorporates ICT, customer, marketing, finance and strategy.

However, it is worth noting that, one common denominator which runs through the above definitions is the provision of services and products through a medium such as computer, television or mobile phone. With this medium, users were able to interact with their banks through a computer connected with dial up modem to a phone network. This mode of electronic banking was widespread in Austria, Singapore, Spain and Switzerland, Korea, and the Scandinavian countries. In these areas, about 75 percent of all banks offered internet banking services (Nitsure 2003).

C. TYPES OF E-BANKING

There are several types of electronic banking delivery channels. Among the most widely used are the ATM, Mobile banking and Internet banking.

D. CUSTOMER SATISFACTION

Customer satisfaction is an overall customer attitude towards as service provider, or an emotional reaction to the difference between what customers anticipate and what they receive, regarding the fulfillment of some need, goal or desire. Kotler (2000), however defined satisfaction as a person's feelings of pleasure or disappointment resulting from comparing a products perceived performance (or outcome) in relation to his or her expectation.

Satisfaction can be associated with feelings of acceptance, happiness, relief, excitement, and delight. Most Researchers has confirmed that the confirmation or disconfirmation of preconsumption expectations is the essential determinant of satisfaction. This means that customers have a pre-defined product performance standard in mind prior to consumption. The resulting judgment is labeled positive disconfirmation, if the performance is better than expected, and negative disconfirmation if it is worse than expected, also simple confirmation, if it is just as expected. So simply, the customer always rates the level that a service or product satisfies him or her to what he or she expects.

III. METHODOLOGY

The design of a study defines the study type (descriptive, correlational, semi-experimental, experimental, review, metaanalytic) and sub-type (e.g. Descriptive-longitudinal case study) research question, hypotheses, independent and dependent variables, experimental design and if applicable, data collection methods and a statistical analysis plan (Singh, 2004).

The study was guided by both qualitative and quantitative research design methodologies.

The methodologies adopted are one of the strongest ways to prove or disprove a hypothesis. It involves the conduct of interviews and/or interrogation; preparation of a number of questionnaires and their administration. The questionnaires were designed to ascertain customers' perceptions on the effect of IT innovations or electronic delivery channels on the banking services in Ghana. The responses were measured with a five-point Likert-type rating scale, where Strongly Agree (SA) = 4; Agree (A) = 3; Strongly Disagree (SD) = 2; Disagree (D) = 1; and Neutral (N) = 0.

A. POPULATION OF THE STUDY

Since the research was about the, impact of electronic banking transaction in Ghana, the population of interest was based on the financial sector. The target populations were customers and workers of Barclay bank, Koforidua branch in the Eastern Region. A population size of 402 was randomly selected for this research. The bank started using ATM service since March, 1995 and currently has 2 ATM at the branch.

B. SAMPLING TECHNIQUES AND SAMPLE SIZE

The sample size was drawn from Barclays Banks, Koforidua branch. The bank was selected on the basis that it offers at least one form of electronic channel product. The researcher also interviewed banking IT executives, customer service managers and couple of the customer facing staff to ascertain the form of IT innovation that has been introduced. A purposeful sampling technique was used to select the customers from the bank. In all 402 customers and 15 bank officials were selected. These officials were selected based on the positions as IT officials or Customer Service Manager and certain key Managers. The customers on the other hand were randomly selected and belonged to the retail segment of the bank that uses theses services day in and out.

C. DATA ANALYSIS

The data collected were analyzed using statistical tools. Simple averages, percentages and descriptive methods were used in the analysis. The data was analyzed in line with the literature hence many references were made to the issues in the reviewed literature of the research work.

A total of 460 questionnaires were sent out. But 402 responses were received, representing a response rate of 87.39%. In order to ascertain perceptions of banking customers with respect to the effect of technological innovation on banking services, descriptive statistics were employed in the presentation and analysis of results.

IV. ANALYSIS AND DISCUSSION OF FINDINGS

A. DEMOGRAPHICS OF RESPONDENTS

The descriptive analysis for demographic profile of respondents which indicated out of 402 respondents, 30.85% were female. In terms of age as table 1 below depicts, 94.53% were between the ages of 18 to 35 years. From the sample respondents, there were no respondents whose age was 51years and above. Marital status of the respondents was 73.88% for single and 24.88% for married. Educational status results showed that 86.56% of the respondents had attained a degree and above. There were no respondents showed that salaried and students were the majority users and they accounted for 94.28%, business men and women accounted for 1.24% but there were no respondent from the pensioner category.

Demographic	Frequency	Percent	Commulative
			Percentage
Gender			
Female	124	30.85	30.85
Male	278	69.15	100.00
Total	400	100.00	
Age			
18-24	218	54.23	54.23
25-35	162	40.30	94.53
36-50	22	5.47	100.00
51-60	0	0	
Total	402	100.00	
Marital status			
Single	297	73.88	73.88
Married	100	24.88	98.76
Separated	5	1.24	100.00
Divorced	0	0	, y
Widowed	0	0	
Total	402	100.00	
Current			
Educational			
Status			
Senior High	23	5.73	5.73
School			
Diploma &	31	7.71	13.44
HND			
University	239	59.45	72.79
Degree			
Master's	101	25.12	98.01
Degree			
Doctorate	8	1.99	100.00
Other	0	0.00	
Total	402	100.00	
Occupation			
Unemployed	18	4.48	4.48
Student	213	52.99	57.47
Salaried	166	41.29	98.76
Business	5	1.24	100.00
man/woman	ž		100.00
Pensioner	0	0.00	
Other	0	0.00	





Responses	Frequency	Percentage
Yes	321	79.8
No	81	20.2
Total	402	100



Senot Water Sol



Figure 2

The results, as indicated in table 2 show that, 79.8% representing 321 out of a total of 402 respondents use one form of electronic delivery system or the other. This indicates that bank customers to a large extent patronize electronic products offered by the bank in the region.

Electronic Delivery Channel	Frequency	Percentage
ATMS	236	58.8
Telephone Banking	102	25.3
PC Banking	44	10.9
EFTPos	12	3.1
Others	8	1.9
Total	402	100

Source: Compiled from questionnaires

Table 3: Type of IT Innovations Used by Customers



Figure 3

With respect to the type of electronic based product used by customers, ATMs appear to be the most widely accepted and highly used electronic delivery tool indicating 58.8% of the total respondents. This is followed by telephone banking representing 25.3% and PC banking bank 10.9%. Electronic Funds Transfer Point of Sales, though, an earlier form of IT innovation, seems to be the least used electronic delivery channel by bank customers. Since ATMs are the widely accepted and highly utilized delivery channel, it is important at this point to ascertain the frequency of it usage among bank customers. This is shown in table 4.

Number of Usage per Month	Frequency	Percentage
Once	52	13.0
Twice	57	14.2
Thrice	86	21.4
Four or more	207	51.4
Total	402	100





Figure 4

Table 4 shows results on the frequency of ATM usage among bank customers. The results show that customers frequently used the ATMs for bank transactions such as cash transfers, checking account balance and printing mini statements. 207, representing 51.4% of respondents who use ATMs indicated that, they visit ATM points about four or more times in a month. However, 13%, 14.2% and 21.4% of respondents pointed out that, they visit ATM points once, twice and thrice respectively every month.

Number of Visits per Month	Frequency	Percentage
Never	38	9.4
Once	107	26.6
Twice	69	17.2
Thrice or more	188	46.8
Total	402	100





The frequency of customers' bank visits is shown in table 5. Out of the total of 402 respondents, 188 representing 46.8% mentioned that, they visit their banks three or more time every month. The results indicate that customers of banking services in Ghana still find it useful to visit their bank branches regularly every month to transact some banking business such as detailed bank statement requests, loan application, foreign funds transfer, etc. for which the ATMs cannot be used. This result goes against the findings of Ahmed B.(2005) who found in contrary to the expectation that visits of customers to the banking hall per month has increased by 11% after using e-banking service in his study of the impacts of e-banking on customer satisfaction in Nigeria.

What is SD, D, N, A, SA, SD- STRONGLY DISSAGREE, D-DISSAGREE, N-NEUTRAL, A-AGREE AND SA-STRONGLY AGREE

Response	Frequency	Percentage	Mean
SD	6	1.3	
D	7	1.7	
Ν	31	7.7	
А	173	43	
SA	186	46.3	
Total	402	100	3.19

Source: Compiled from questionnaires

Table 6: Response to Customers' Requirements



Table 6 above, shows the responses of customers' requirements with respect to how fast enquiries about their accounts can be made. Out of a total of 402 responses, 89.3% agreed that IT Innovation makes enquiry about the state of their accounts faster whiles 3% representing 13 respondents disagreed. A mean of 3.19 confirms that IT Innovation makes enquiry about the state of accounts faster.

Response	Frequency	Percentage	Mean
SD	6	1.5	
D	7	1.7	
Ν	33	8.3	
А	172	42.7	
SA	184	45.8	
Total	402	100	3.16

Source: Compiled from questionnaires



The responses of customers as shown in Table 7 confirm that Technological Innovation reduces the time involved in bank transactions. Out of 402 respondents, 356 representing 88.5% agreed that the time involved in transacting business with their banks can be reduced significantly with IT. A total of 13 respondents representing 3.2% however disagreed with this view. A mean of 3.16 confirms the perception of customers that IT reduces the time spent at the bank in order to transact business.

Response	Frequency	Percentage	Mean
SD	2	0.6	
D	14	3.5	
Ν	62	15.5	
А	203	50.4	
SA	121	30.0	
Total	402	100	2.79

Source: Compiled from questionnaires Table 8: Effect on service delivery



Figure 8

Table 8 above gives the responses of customers about the effect of Technological Innovation on service delivery. About 324 representing 80.4% of the customers who responded agreed that IT Innovations ensures efficient service delivery. The number of respondents who however disagreed was 16 representing only 4.1%. 15.5% of respondents out of 402 held a neutral view. A mean of 2.79 shows that IT Innovation enables banks to deliver efficient services to their customers.

Response	Frequency	Percentage	Mean
SD	2	0.9	
D	5	1.8	
Ν	33	12.7	
А	129	50.4	
SA	88	34.1	
Total	1,210	100	2.92

Source: Compiled from questionnaires Table 9: Effect on quality of product and services



Figure 9

From the table 9 above, majority of the customers generally agreed that the quality of the products and services of banks have be improved with IT Innovation. Almost 217 signifying 84.5% of respondents agreed that IT Innovation improves the quality of bank products and services whiles 34

(2.7%) of those who responded disagreed with this position. The mean of 2.95 confirmed that IT Innovation improves the quality of products and services offered by banks.

Response	Frequency	Percentage	Mean
SD	4	1.1	
D	15	3.8	
Ν	68	16.9	
А	205	51.0	
SA	109	27.2	
Total	402	100	2.71

Source: Compiled from questionnaires





From table 10, out of a total of 402 respondents, 78.2% agreed that IT Innovation provides adequate responses to their inquiries of products/services information, as against 4.9% who disagreed. This is reflected by the mean of 2.71 which confirms that, IT Innovation provides adequate responses to customer's inquiries.

Response	Frequency	Percentage	Mean
SD	6	1.4	
D	12	3.1	
Ν	87	21.7	
А	184	45.8	
SA	113	28.0	
Total	402	100	2.57





Figure 11 The willingness of customers to continue saving with their banks is shown in the Table 11 above. 297 respondents representing 73.8% of the customers agreed that they will continue to save with their banks. They also believe that IT Innovation attracts customers to their banks. However, nearly 4.5% of the total respondents of 402 disagreed. 21.7% neither agreed nor disagreed with this assertion. A mean of 2.57 shows that, most of the respondents, appear to be satisfied with the services and products offered by their respective banks and so will continue to save with the banks.

Response	Frequency	Percentage	Mean
SD	17	4.2	
D	55	13.7	
Ν	105	26.0	
А	135	33.6	
SA	90	22.5	
Total	402	100	2.23

Source: Compiled from questionnaires





Figure 12

The results as shown in table 12, confirm the fact that, the advent of IT Innovation has led to increased bank charges. Even though 17.9% of the 402 respondents disagreed with this assertion, 56.1% agreed that IT Innovation has resulted in increased bank charges. This fact is reflected by the mean of 2.23. The mean value of 2.23 shows that bank charges have increased as a result of increased investments in IT Innovations.

Response	Frequency	Percentage	Mean
SD	3	0.7	
D	16	3.9	
Ν	68	17.0	
А	213	53.0	
SA	102	25.4	
Total	402	100	2.69

Source: Compiled from questionnaires Table 13: Effect on bank productivity



Table 13 above, shows the responses of customers with respect to the impact of IT Innovation on bank productivity. A total of 315 respondents representing 78.4% agreed that IT Innovation increases bank productivity 4.6% respondents however did not agree that IT Innovation increases bank productivity. The mean value of 2.69 shows that bank productivity can be increased with the introduction new electronic channels.

Response	Frequency	Percentage	Mean
SD	3	0.7	
D	8	2.0	
Ν	37	9.2	
А	168	41.8	
SA	186	46.3	
Total	402	100	3.15



Table 14: Effect on Bank growth



The response of customers with respect to the impact of IT Innovation on the growth of their banks is shown in the Table 14 above. About 354 customers representing 88.1% agreed that IT Innovation has made a positive impact on the growth of their banks as against 11 customers representing 2.7% of the valid responses who disagreed. A mean value of 3.15 shows, technological innovation has had a positive impact on the growth of banking in the region.

Response	Frequency	Percentage	Mean
SD	127	31.5	
D	148	36.8	
Ν	57	14.2	
А	40	10.0	
SA	30	7.4	
Total	402	100	1.65

Source: Compiled from questionnaires Table 15: Importance of Human tellers to bank customers



Customers' responses about the importance of human tellers to banking operations are shown in table 15. Out of the total sample respondents of 402, 275 signifying 68.3% of customers disagreed with the assertion that human tellers are no longer important whiles 70 representing 17.4% of respondents held the view that, human tellers are important. The mean of 1.65 confirms the fact that human tellers are still considered important in banking, even in the face of increased investment in IT innovation and electronic delivery systems. This is an indication that bank customers in Ghana still highly value the importance of the personal touch in banking services.

Waiting time	Frequency	Percent
I don't Know	51	12.7
Above one hour	110	27.4
31min – 1hour	158	39.3
16-30 minutes	41	10.2
15 minutes	8	2
6-10 minutes	17	4.2
Within seconds	1	0.3
Total	402	100

 Table 16: Waiting time Average time per-routine transaction

 before e-banking



Figure 16

Waiting time	Frequency	Percent
I don't Know	9	2.2
Above one hour	11	2.7
31min-1hour	28	7
16-30 minutes	14	3.5
15 minutes	56	13.9
6-10 minutes	272	67.7
Within seconds	12	3
Total	402	100

Source: Compiled from questionnaires Table 17: Average time per-routine transaction after e-

banking



Figure 17

The results of the sample in the tables above, shows that respondents agreed that e-banking has reduced waiting time. This results support the findings of Sampson (2005) that ebanking services have been able to save time at the expense of man-hour to the satisfaction of customers.

V. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

Technological development in the Banking sector in Ghana has gone through many changes in its service delivery with the aim of improving the quality of service being provided to the customers.

A. SUMMARY

Findings from the research show that the introduction of information technology into banking operations in Ghana has

not only improved the quality of service being rendered to its customers, but also reduced the operational cost of the company under review. Lower cost of operations will reflect in maximization of profit. This study also revealed that customers were aware of most of the electronic banking products being offered by the bank in focus and even though most of them were satisfied, they still expect more from the banks as well. Also majority of the banks current e-banking users are the youth between the ages of 18 up to 35, the male gender were dominant users. Educationally, diploma and above holders are the majority users and e-banking has highly reduced the visits to the banking hall and waiting time has greatly reduced.

B. CONCLUSION

The study has revealed that the use of CCTV cameras especially on the Automated Teller Machines (ATMs), passwords and SMS alerts are some of the supplementary security features used in addition to the Personal Identification Number (PIN) codes given to customers. The study further revealed that the most commonly used e – banking service channel is the ATMs, followed by the e-zwich with the least being telephone banking. The study also deduced that network reliability possesses a major problem for the bank in its aim to satisfy its customers. It was revealed that aside the numerous benefits derived from e – banking; it has its own attended problems.

C. RECOMMENDATION

In order for e – banking to have a positive impact in the Ghanaian banking industry and create customer satisfaction, the following recommendation are made:

- ✓ E-banking delivery channels must work well in order to gain trust of the customers that use them. Since customers' decisions to adopt e − banking is based on trust. Systems must be put in place to minimize or total eradicate problems customers encounter in the use of electronic facilities. Also much more education needs to be done on the effective use of such facilities.
- ✓ Banks must ensure that they install more Automated Teller Machines (ATMs) at so many convenient places to bring e – banking to the doorstep of their customers.

Banks must ensure that they have a stable network system through good quality of service Agreement with the service providers. In this area more than one service provider can be engaged so that if one network is not stable, the other can be fallen on.

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