THE STRATEGIC USE OF INFORMATION TECHNOLOGY IN THE RURAL BANKING SECTOR IN GHANA (NWABIAGYA RURAL BANK AS A CASE STUDY)

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ABSTRACT

The objective of this study is to evaluate the strategic use of Information Technology in the rural banking sector in Ghana. The study is case type in design and used a combination of probability and non-probability sampling techniques in selecting its sample. The analysis revealed that Nwabiagya Rural Bank lacks the desired technologies to support its operations. However, it was able to strategically employ the very limited technologies it has in place to gain some advantages in the sector. These advantages are shortening of customers' waiting time, cut down on its operating costs, provide convenient banking services to its customers and attract a large customer base thereby increasing its sales volume and experience sharp increases in its profit level since the deployment of ICT into its systems. Two major factors were found to be militating against the accelerated deployment of innovative technologies namely: lack of funds and a restrictive ICT policy by supervisory bodies like the Bank of Ghana and the ARB Apex Bank. The study concludes that, ICT has a positive impact on the bank's operations and therefore serves as a tool to attain competitive advantage in the banking industry.

Introduction

The quest for business to acquire strategic tools, skills and other resources in order to remain competitive, profitable and grow has never been witnessed in the Ghanaian business environment as in contemporary times. Many industries in the economy, especially the telecommunication and the banking industries, are seen to be engaging in full scale competitive war, leading to sharp price reductions in their services, yet posing a great threat for survival for those that cannot easily align themselves with the use of modern

technologies, which are the weapons of the ongoing competitive war.

This study therefore seeks to find out how the rural banking sector in Ghana is using Information and Communication Technology (ICT) as a tool to cope with the ongoing competition in the banking industry.

1.1: Background of the study – the Rural Banking Concept

Rural banks (RBs), like any banking institution in Ghana, are formal sector financial institutions established as public limited liability Companies and operate under the **Banking Law 1989 (PNDC Decree 225).** The mandate of RBs, among other things, is to mobilize savings from residents in the rural communities, accept cash and cheques for credit on current and saving accounts, assist customers in respect of their activities with a view to consolidate, extend and develop their undertakings and engage in any economic activity that will promote the social and economic development of the community within which they operate **(Anin, 2000)**.

1.2: Rural bank as a strategic economic institution in Ghana

The concept of rural banking evolved in Ghana in the mid 1970s in response to the needs of the rural and agricultural sector for institutional finance. Though the rural and agricultural sectors were the largest contributors to the nation's Gross Domestic Product (GDP) contributing 40% to GDP, 60% of foreign exchange earning and provide employment to over 70% of the Ghanaian populace and remains a priority sector, it is characterised by low productivity due mainly to inefficient production technology and post-harvest bottlenecks. It is recognised, though, that growth in the sector could be accelerated if there is increased investment in more modern production technology, infrastructure and enterprises involved in storage, processing and marketing (MiDA, 2008).

Attempts in the past to encourage commercial banks to extend their rural networks and advance credit to the agricultural sector failed to achieve the desired results since most of these banks tend to concentrate on financing international trade and urban commerce and industry. Not even the creation of specialized banking institutions like the agricultural development bank and the investment banks to service the sector yielded any good results as they also tend to gravitate towards the traditional banking activities which were more profitable and less risky. There was, thus, a gap in the provision of institutional finance to the rural/agricultural sector, which is the 'backbone' of the nation's economy and, thus, the rural banks were expected to fill this gap.

Due to the strategic role that the rural banking sector plays in the economic development of the nation, it is imperative that these banks remain competitive, profitable and grow. In the past decade however, changes in the global economy have entirely redefined industrial competitiveness. The core business of various entities, for instance, in the manufacturing industry, is no longer confined to the making of things but lies in the systematic processing of knowledge through the use of ICT to create value for customers.

The strategic importance of ICT either in manufacturing or service industry is highlighted by **Lau (2001)** when he intimates that:

Manufacturing-related business services that capitalize on the Internet and Information Technologies are expanding fast, and in fact, the availability of digital tools and equipment in the marketplace provide a major opportunity for enterprises to build stronger relationships with customers and partners which is the key to build a successful business.

The place of ICT in the banking industry is made much clearer by **Agboola (2007)** when he posits that:

Today's business environment is very dynamic and undergoes rapid changes as a result of technological innovation, increased awareness and demands from customers. Business organisations, especially the banking industry in the 21st Century operates in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate. Information and Communication Technology (ICT) is at the centre of this global change curve.

Laudon and Laudon (1991) contend that managers can no longer ignore information systems because they play critical roles in contemporary organisation. They point out that, the entire cash flow of most 'fortune 500' companies is linked to information systems.

1.3: Statement of the Problem
The banking industry in Ghana has witnessed tremendous changes linked with the developments in ICT over the years. The quest for survival, global relevance, maintenance of existing market share and sustainable development has made exploitation of the many advantages of ICT through the use of automated devices imperative in the industry.

Yet, the rural banking sector, which is a key strategic sector in the banking industry in Ghana aimed at accelerating rural and agricultural development, appears to have a blurred picture in the adoption of ICT in its operations in the country. This situation coupled with the continuous influx of foreign and multinational banks into the country, with their determination to compete in all fronts in the industry poses a big threat to the competitiveness, profitability, survival and growth of the rural banks in the country. This situation has created a source of concern for the researchers, particularly when it is well known that the competitive position and the ability to maintain market share and growth in the banking industry is mainly dependent on the degree of diversified services provided by banks in the industry is facilitated by the adoption of various ICT facilities (Agboola 2007). The implication is that, if the RBs failed to remain competitive or are kicked out of the banking industry, the agricultural sector which is the major contributor to our nation's GDP will greatly suffer as none of the other commercial banks that are leading the competition in the industry is willing to advance funding to the sector.

This study therefore seeks to evaluate how Ghanaian Rural Banks are utilising ICT as a competitive and strategic tool in the banking industry, examine the extent to which they have adopted and deployed innovative technologies and analyse the resultant effects of these technologies on their operations.

1.4: Hypothesis of the study
1.4.1: *Technology deployment and company competitive position*
Technology generally has positive relationship with the competitive position of the adopting

institution. The fortune made by a number of successful world organisations is tied to technology deployment into their facilities (Agboola, 2007; Banks, 2007; Abor, 2008; Kucthta-Helbling, 2003; Laudon and Laudon, 1991). Factors such as time saving, error reduction, quality management decisions, speed of transactions, enhanced market share, and customer satisfaction with service quality, customer loyalty, and improved revenues among others, were assigned for the competitive impact that technology deployment brings to bear on the deploying institutions. The hypothesis couched out and verified relating to IT/organisation's competitive position therefore is of the form:

H$_o$: Technology deployment is not related to an organization's competitive position

H$_1$: Technology deployment is related to an organization's competitive position

1.4.2: Extent of economic gains from investment in new technology

In general, a positive relationship between relative advantages and technological adoption has been found (Quaddus et al., 2006; Weill and Aral, 2006; Kwon & Zmud, 1987; Rogers, 1983). However, economic gains from technological investment cannot be obtained synchronously. First, when new technologies are introduced, their potential may not be exploited fully because quite a few technologies are implemented on a trial and error basis (Ganon & Toulouse 1996). Second, during the initial stages, advantages of technologies cannot be obtained or even precisely determined whereas short-term costs are readily available (Gerwin, 1988). Third, technological investment requires an adaptation and learning process to combine environment, organization, team, task and technology for gains. Once the misalignments of these factors are corrected and end users eventually adapted, economic returns then will turn out fruitfully (Applegate, 1992). Consequently, technologies have to be substantially invested together with minimum efficient usage then advantages from technology can be harvested. The hypothesis relating to economic gains from IT investment therefore is:

H$_o$: Economic gains cannot be obtained after a new technology has been substantially invested into.

H$_1$: Economic gains can be obtained after a new technology has been substantially invested into.

1.4.3: Training support impact on technology diffusion

Apart from technical features, important factors influencing the success or failure of technological implementation are organizational aspects such as training, top management support, interactions during implementation, user involvement, and motivated and capable users' attitude (Quaddus et al 2006; Kwon & Zumud, 1987; Manross and Rice, 1986). Since innovation can succeed only if end users have a full understanding of the technology, training is considered as vital policy to provide knowledge, reduce levels of resistance, create skilled human resources and increase managerial potential (Madu, 1989) as cited in (Quaddus et al. 2006). Generally, technology diffusion changes positively with level of training support. When technology is diffused, it creates learning environment that convince more end users to attend training and more trained staff and active staff enhance diffusion rate (Quaddus, 1996). Therefore, the hypotheses regarding training support are in the form:

H$_o$: Training support cannot increase the rate

of technology usage, relative advantage and sales.

H₁: Training support increases the rate of technology usage, relative advantage and sales

2.0: Research methodology
2.1: Study design
This research is case study conducted to evaluate how the organization was strategically using IT/ICT in its operations to gain competitive advantage in the banking industry in Ghana. The researchers chose this approach because many researchers namely **Heggade (2000)** used the case approach to study bank customer relationship in India. **Sharma and Singh (1993)** used the case study approach to analyze the impact of Information Technology on quality of customer services provided by Standard Chartered Bank (SCB), and **Shastri (2001)** analyzed the effect and challenges of new technology for banks using a case study approach. The researchers were therefore guided by the wide use of this approach in literature in the choice of design.

2.2: Sample size determination
2.2.1: Population of the study
The population of the study is made up of 15 management staff of the bank, 101 other members of staff of the bank and 40,573 customers as at 2005. The customers of the bank were made up of those who held various accounts with the bank before and after the deployment of ICT into its operations. The bank has two broad categories of customers: those in the formal sector, made up of salaried workers were approximately 13,524 and those in the informal sector, made up of petty traders and crafts men approximated at 27,049.

2.2.2: Sample size
The researchers used a total of 183 samples made up of 8 management staff, 51 other members of staff of the bank and 124 customers as sample for the study. However, the researchers were able to retrieve 94% of the questionnaires out of the 51 sent to the members of staff of the bank. The total sample employed in the analysis was therefore 180. Also, from the records of the bank, the researchers realised that formal sector customers were approximately one third of the total customers' population of the bank for the period under review. The researchers therefore used a ratio of 1:3 (formal sector customers: informal sector customers) for the selection of sample customers for inclusion in the study. The selection of the above sample was to provide representative views from the management, other members of staff and the various customer groups of the bank on the effect of ICT on the bank's performance.

2.2.3: Sampling Techniques
The researchers employed both probability and non probability techniques to select respondents for the study. The researchers used purposive sampling technique to select 8 out of the 15 management staff of the bank. The researchers applied this technique because of the expert views of this category of the sample on the subject of the study. It came to light during interactions with the management of the bank that some management staff of the bank joined the bank after the diffusion of ICT into the bank's operations. However the researchers were interested in the views of those management staff who were with the bank before, during and after the deployment of ICT into the system since they were in a better position to tell what effects ICT has brought to bear on the bank's operations based on their experience before and after the

deployment of the technology into the bank's operations. The technique also made it possible for the head of ICT unit of the bank to be included in the study since he has an in-depth view on the use of ICT in service delivery of the bank. For the selection of the sample from the bank's members of staff, the researchers used systematic random sampling technique. A list of names of members of staff was obtained and a sampling fraction of ½ was chosen. The list of the names of members of staff of the bank therefore constitutes the sampling frame of respondents for the bank's staff. The sample fraction for the bank's staff therefore is:

$$\text{Sampling fraction} = \frac{\text{Actual sample size}}{\text{Total population}}$$

$$= \frac{50.5}{101} = \frac{1}{2}$$

The researchers used systematic random sampling to select 51 persons from the list of staff members of the bank as sample for the study.

For the selection of customers as sample for the study the researchers employed a combination of stratified, quota and accidental sampling techniques. The customers of the bank were grouped into various strata (branches) and a quota consisting of a sample approximation of 24 persons was taken from each of the five out of the seven branches of the bank randomly selected. The assigned quota samples were then interviewed for inclusion into the study using accidental sampling.

Observation of the work processes of the bank was also done by the researchers to verify issues such as type of ICT tools that the bank has in place and waiting time of customers in the banking hall.

Results and discussion of the results

Data gathered were analysed using descriptive statistics. The findings of the study were presented using appropriate tables and charts to ensure easy interpretation.

Length of service of respondents/date of becoming a customer of the bank

Five (5) management staff respondents representing 62.5% served between 7-10 years while three (3) served the bank for more than 11 years. 44 of the general staff representing 91.7% of the staff respondents served between 0 – 10 years while 4 constituting 8.3 % served 11 years and above. Sixty customer respondents representing 48.39% joined the bank around 1997 - 1999 and 32 customers constituting 25.81% of this category of respondents joined the bank in the year 2000 and around 2001 – 2005 respectively.

The views of respondents on the length of service/date they joined the bank is very essential to the study since respondents who were part of the bank before and just after ICT was deployed by the bank are in a better position to assess the effects that ICT is having on the operations of the bank and to tell how NRB is using ICT as a competitive tool in its operations.

The analysis revealed that, all the management staff respondents were part of the bank before ICT was deployed into the operations of the bank. That is, they have served the bank for nearly 10 years and above implying that they joined the bank before the year 2000 when ICT

was deployed into the operations of the bank. For the general staff respondents of the bank, majority of them served between 0 – 10 years implying that many of them were with the bank before the deployment of ICT into the system. On the part of the customer respondent 48.39% joined the bank before the year 2000 and 25.81% joined in the year 2000 making a total of 74.2% of the customer respondents who were part of the bank before ICT was deployed into the system. This inference is made based on the fact that ICT was deployed in 2000 and so those who joined the bank in that year might have experienced the old state of the performance of the bank before full benefit could be harvested from the new technology. The sample groups are therefore deemed to be significant in providing a sufficient insight into the situation under study.

3.2: Hypothesis testing

Three hypotheses were couched out and tested as a mean to provide statistical evidence on which conclusion of the study was based. These hypothesis were tested using chi square and the P – value of test statistic propounded by Keller, 1991.

To test the first hypothesis the researchers used such variables as 'cut down in operation cost, increase productivity, short waiting time and a general assessment from respondents on the bank's performance' since ICT was deployed by the bank as measures for use of ICT to gain competitive advantage.

From the test as illustrated by the Chi Square, table 1 shows a P-value of .000 for the variables tested. Since the P- value of each of the various variables was less than 0.05 which is the significant level at which the null hypothesis should be rejected or accepted, there is strong statistical evidence that the null hypothesis was not true and was therefore rejected. The alternate hypothesis was thus, accepted that technology diffusion is related to a company's competitive position.

Table 1: Test Statistics of ICT on Company competitive position

	ICT DOES NOT HELP CUT DOWN BANK'S OPERATING COST	ICT DOES NOT INCREASE THE PRODUCTIVITY OF NRB	ICT DOES NOT HELP REDUCED CUSTOMER WAITING TIME	EVALUATING THE PERFORMANCE OF BANK SINCE ICT WAS DEPLOYED
Chi - Square	21.125 [a]	12.000 [b]	18.750 [b]	36.375 [a]
Df	7	7	7	7
P -value	.000	.001	.000	.000

Source: field data 2008

For the second hypothesis the researchers tested the view of respondents as to what time in the deployment of a new technology the investing institution could expect economic gain from the investment since it was evident in literature that economic gains cannot be made synchronously as new technology is being deployed. The result of the test as shown in the Chi -Square distribution Table 2 below rejects the null hypothesis of all the variables tested. As a result, the study supports the position of Ganon & Toulouse (1996);

Applegate (1992) and Gerwin (1988) that gains from new technologies may not be fully exploited as the system is being deployed due to such factors as misalignment of the technology with the organization's environment, team, task and structure as well as the skill of staff, and the need for the staff to go through an adaptation and learning process to have the system well aligned for the necessary gains to be harvested.

TABLE 2: Test Statistics showing level at which gains from new technology occur

	BENEFITS FROM ICT ARE NOT FULLY MADE AFTER END USERS BECOME USED TO IT	MUCH GAINS FROM ICT CANNOT BE MADE IN THE FIRST YEAR OF DEPLOYMENT	FOR GAINS TO BE MADE FROM ICT THE TECHNOLOGY MUST NOT ALIGN THE STRUCTURE OF THE ORGANIZATION
Chi-Square	32.087 [a]	19.500 [b]	26.375 [c]
Df	7	7	7
P-value	.000	.000	.000

Source: field data 2008

With regards to the third hypothesis, the researchers tested the views of respondents on the effects of training support on technology diffusion, increased usage and increased sales volume using such variables as general training, top management training, end-users' training and banks with high ICT skilled personnel against those that do not have such skilled human resources. The test as shown in the Chi Square distribution Table 3 below rejects the null hypothesis as the P-value of all the variables were less than 0.05. This provides strong statistical evidence that the null hypothesis should be rejected and the alternate accepted. Thus, training support increases technology diffusion, rate of usage and sales.

TABLE 3: Test Statistics showing training effect on rate of technology diffusion, usage and sales

	TRAINING SUPPORT DOES NOT AID SUCCESSFUL TECHNOLOGY DIFFUSSION	MGT TRAINING IN ICT SKILLS WILL NOT ACCELERATE TECHNOLOGY DIFFUSSION IN THE SECTOR	TRAINING OF END USERS DOES NOT ENSURE HIGHER PERFORMANCE	BANKS WITH HIGH ICT SKILLED PERSONNEL HAVE NO RELATIVE ADVANTAGE OVER OTHERS WHICH DO NOT
Chi-Square	27.000 [a]	57.333 [b]	19.500 [c]	34.833 [b]
Df	7	7	7	7
P-value	.000	.000	.000	.000

Source: field data 2008

3.3: ICT tools deployed by NRB

Nwabiagya Rural Bank (NRB) has a limited number of innovative technologies which support its operations as shown in Table 4. The bank has 56 Computers, 54 UPS, 7 Servers, 13 Printers, 6 line phones and one fax machines. All the computers were hooked onto the local area network (LAN) in the various branches with 3 of the branches (Magazine, Sagoe lane and Bohyen) integrated into wide area network (WAN) enabling customers of those branches to access their accounts with any of the three branches.

Table 4: Types of Innovative Technologies at NRB

TYPES OF ICT TOOLS	NUMBER OF ICT TOOLS
Computers	56
UPS	54
Server Computers	7
Printers	13
Telephones	6
Fax machines	1

Source: Field data 2008

3.4: Use of ICT as a strategic tool in the Rural Banking sector in Ghana

Reacting to how the bank was strategically using ICT in its operations, 100% of the management staff respondents said they apply ICT to shorten customers' waiting time. 91.7% of the other staff members of the bank strongly agreed that they used ICT to transact fast business with customers with 77.4% of the customer respondents strongly agreeing that less waiting time in the banking hall was the basis of the attraction of the bank to them. A further 98.3% of the customers stated that the less waiting time they spent in the banking hall provided them satisfaction to continue to transact business with the bank.

The management of the bank further intimated that they use ICT tools to provide convenient banking to their customers. On the issue of using technology as a tool to track credit standing of customers, 75% strongly agreed that ICT tools deployed by the bank helped the bank track the credit status of customers of the bank. Fifty percent (50%) of the management respondents also strongly agreed that ICT assisted the bank track the performance of the various products of the bank. The researchers further sought to find out whether technology could be a tool for competitive advantage, 79.2% of the bank's staff respondents strongly agreed. This analysis brought to light a finding which supports the views of Bruno-Britz (2007) who holds that *'the introduction of ICT tools can provide a business that extra edge of competitiveness'*. However, 4.2% slightly disagreed with this view. The position of this minority group also explained the views of Strassman, (1990) who maintains that, *'gains from strategic information system is difficult to measure due to the fact that information system success is so intertwined with other aspects of how a business is conducted'*. This therefore makes it difficult for some people to see how precisely technology is leading a company to gain a competitive edge. Also, the view of this minority group of staff respondents further confirms the views of Kettinger et al. (1994) as cited in Brown et al.,(1995) that *'if competitive advantage is gained from innovative technologies, it may not be sustained as innovation is easily copied by competitors.'* This is what we are witnessing in the banking industry in contemporary Ghana where banks are doing all things possible to copy any technology that their competitors deployed. Kettinger et al therefore concluded that *'if the technology is*

easily copied then the deploying institution may rather be at an economic disadvantage due to the high cost involved in pioneering the system innovation'. As a result of this tendency critics hold the view that technology is not a factor in gaining competitive advantage.

3.5: Impact on cost

Reacting to cost dimension impact of ICT on the operation of the bank, 50% of the staff respondents strongly agreed that ICT helped the bank cut down on its labour cost while the other 50% also held that ICT was somewhat important in cutting down labour cost to the bank. 93.7% of these respondents state that ICT has helped the bank to cut down on its general operating cost with 6.2% stating that they do not share the view that ICT was responsible for a reduction in the operating cost of the bank. However, views from the management staff respondents pointed out that since the bank networked its operations in the year 2000, the closing time of staff has drastically reduced from 7.00 pm and beyond to between 4.00 – 5.00 pm. In fact 100% of management staff respondents of the bank shared this view and intimated that this has led to a great reduction in such costs as overtime expenses.

3.6: Impact on profitability

Addressing the question as to whether ICT had any effects on the profitability of the bank, 75% of management staff respondents strongly agreed that the introduction of ICT has brought about efficient management decisions by the bank. This, they argued, has made the bank more attractive to customers thereby attracting a large customer base and large sales volume by the bank resulting in the profitability of the bank. The management staff respondents further strongly held that the introduction of ICT in the year 2000 has tremendously improved the transaction of

the bank and thereby resulting in the bottom-line of the bank's profitability. Also, 75% of the bank's staff respondents strongly agree that ICT has greatly increased the productivity of the bank. A further 41.7% said ICT was very important in facilitating easy introduction of new products by the bank. This ultimately results in the profitability of the bank. Further more, addressing the issue of ICT and the profitability of the bank, secondary data collected from the banks Books of Accounts on the profit levels of the bank over the periods covered by the study shows that the bank has recorded a continuous increase in profit far above the years before 2000 when ICT was deployed to the bank as shown in Figure 1.

FIGURE 1: ICT IMPACT ON NRB'S PROFITABILITY

YEARS (1997-2005)
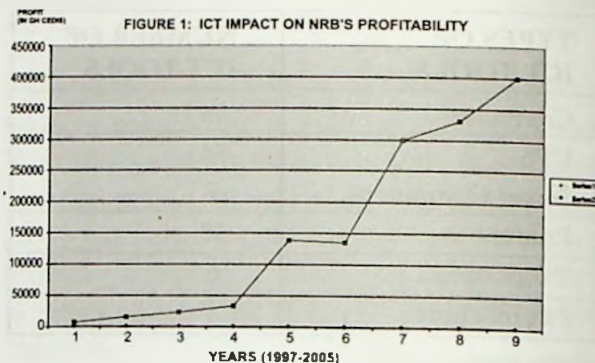
Evidence from the ICT effects on the bank's profitability analysis revealed that the bank's profit level went up sharply between the years 2000 and 2001 (points 4 and 5) after ICT was deployed into the system. There was however a nearly constant profit level between 2001 and 2002 (points 5 and 6) and picked up again strongly in 2003 and sustained the upward trend through out the rest of the period. What is significant in this analysis is that, the rate of increase in the profit of the bank was higher from the time ICT was deployed into the system than the situation in the years before, indicating that ICT deployment has a significant effect on the profitability of the

bank. However, the sharp increase in the year 2000 defeats the argument by Gerwin (1988) that 'during the initial stage of the introduction of technology into a system, advantages of the technology cannot be obtained'. This therefore calls for further research into what accounts for this increases.

3.7: Factors responsible for the slow rate of ICT deployment in the Rural Banking sector in Ghana

Three major factors prominently surfaced, among others, as the key elements militating against the accelerated deployment of ICT in the Rural Banking Sector. These are lack of funds by the Rural Banks, inappropriate technology policy by supervisory bodies like the Bank of Ghana and the ARB Apex Bank and lack of clear understanding of ICT functions and management support. These positions were evident in the analysis with 100% of the management staff respondents strongly agreeing that lack of funds by the rural bank was responsible for the slow deployment rate. This position was shared by 91.7% of the bank's other staff respondents. A further, 75% of the bank's management and other staff respondents strongly held that lack of appropriate policy by supervisory bodies was responsible for the slow rate of technology diffusion in the sector. Also, the bank's other members of staff held that lack of clear understanding of ICT functions and management support were all responsible for the slow rate of technology diffusion to the bank.

3.8: Means to accelerate technology deployment in the rural banking sector in Ghana

When asked what could be done to ensure accelerated deployment of technological tools in the sector, 50% of the management respondents stated that adequate funding

support to the rural bank was necessary if the sector was to see any growth in the deployment of ICT in the sector. Also, 75% of these respondents said the Bank of Ghana and other supervisory bodies that oversee the affairs of the RBs should give rural banks the free hand to determine their own fate as do other commercial banks when deciding which technology to deploy. The management of the bank lamented in an interview that though the policy by the Bank of Ghana and the ARB Apex Bank that all RBs should deploy same technological platform (Emerge), might have some common benefits to the RBs, it is restrictive and places a lot of burden on those banks that could not afford that technology. They suggested that those banks which could not afford the Emerge should be allowed to deploy any technology that might be capable of supporting their operations.

Conclusion

The study concludes that though NRB has limited technological tools in place, the bank has been able to strategically use the very few technologies it has as a strong competitive tool to cut down on customers' waiting time, attract customers, deliver fast and convenient transactions, cut down on its operation cost, support efficient management decision making process, increase its productivity and profit levels since the deployment of ICT into its operation.

On these bases, the study concludes that ICT has a strong positive impact on the bank's operations and therefore serves as a strategic tool to attain a competitive advantage in the banking industry in Ghana.

Recommendations

Based on the findings and conclusion of the study the researchers recommend as follows:

First, since the results of the study indicate that NRB, like other rural banks in the country, has very limited innovative technologies in place, against the background that the bank's operations have seen much improvement as a result of the few ICT tools it has deployed, the management of NRB should endeavour to bring on board more innovative technologies to help the bank survive the current wave of competition in the banking industry so as to contribute its roles to the economic development of the nation.

Second, the results of the study further indicate that though NRB has succeeded in strategically employing the few ICT tools it has deployed, the technology is not very functional resulting in intermittent break down in service delivery to customers. It is therefore recommended that the bank should take steps to consult experts on powerful tools that can support its technology to ensure efficient service delivery.

Third, with the finding that lack of funds and inappropriate policies were the principal causes of the slow rate of technology diffusion in the rural banking sector, the study recommends that government should provide these banks with adequate funding to assist them acquire the necessary technologies to support their operations and remain competitive. This is imperative as the continuous existence of these banks is very crucial for the growth of the rural economy especially the agricultural sector which continues to be the back bone of the nation's economy.

Fourth, it further recommends that the Bank of Ghana and the Apex Bank should formulate policies that give the rural banks a free hand to decide their own fate on technology deployment issues since it was revealed that these bodies want all rural banks to roll out same technological platform which might be unsuitable for some or too expensive for them to afford.

Fifth, management of the rural banks should ensure that they involve their workers (end users) in any technology deployment discussion to guarantee system ownership by all those who are to ensure that the system works. Training support, top management commitment, and staff motivation should also be looked at to ensure that the rural banking sector sees in the near future an accelerated deployment of ICT in the sector to make the sector more competitive.

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