Impact of Digital Revolution on the Structure of Nigerian Banks

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28. July 2009

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Abstract
The study examined the extent to which digital revolution has affected the organizational structure of Nigerian banks. Twenty-five banks were selected for the study in south-western Nigeria. Interview was conducted for middle and top level managers and questionnaire was developed and administered to the other staff using a five-point Likert scale to determine the attitudes and opinions of the staff on the effects of digital revolution on the organizational structure of the banks. The mean was used as an indicator of central tendency for quantitative variables that have frequency distributions in the study.
The study found that standard operating procedures, politics, culture, surrounding environment and management decisions were all affected by digital revolution. It affected the organizational balance of rights, privileges, obligations, responsibilities, and feelings that have been established over a long period of time. The revolution brought structural changes in the line and unit of command, the principles of span of control, unity of command, and scalar principle of graded chain of superiors in the studied banks. It encouraged flat organizations as decision making became more decentralized. It also altered the required skill and increased the perceived advantage of workers with computer engineering background. Authority relied on knowledge and competence and not on mere formal position The study concluded that digital revolution has changed the course of history in the banking industry leaving far reaching effects and implications on both the organizational and industrial structure. It is imperative for banks and their staff to effect proper restructuring that will facilitate optimal utilization of the benefits provided by the revolution.

Keywords: *Digital Revolution, ICT, e-Commerce, Organizational Structure, Nigerian Banks*
JEL: *L22, L81, L89*

Introduction

Digital revolution has transformed the nature and content of banking leaving behind far reaching effects and implications on both the organizational and industrial structure (Wikipedia, 2007). It has utilized developments in information and communication technology to usher in the era of information economy where the productivity and competitiveness of units or agents in the economy (be they firms, regions or nations) depend mainly on their capacity to generate, process, and apply knowledge-based information efficiently (Castells, 1996) It is an economy where information is both the currency and the product.

Dwyer (1999) confirmed that Information Technology has had more impact on more fundamentals, more quickly, than virtually any other external change in the history of the banking industry. It is transforming every aspect of a bank's business, from its management information to the nature of the products and services it offers. It fundamentally affects many of the key drivers of both cost and revenue, which increasingly determine a bank's overall profitability and competitive positions. Darlington (2000) noted that the revolution has changed the very nature of banking. Though money is still being handled, information, not money, is now the lifeblood of the banking industry. He claims further that from what was essentially a transaction-based business, where customers came to the bank (or didn't), banking has made the leap into what is essentially a sale-and-marketing culture. In the new culture, a bank is defined almost solely by its ability to add value to the customer relationship, which breaks down into acquiring, analyzing, integrating, and leveraging of information about, from, and for the benefit of each individual customer

A pervasive use of information and communications technology is necessary because the relative standing of staff within each bank and that of banks within the industry is influenced by the ability to utilize the various opportunities provided by the digital revolution. Differential rate of utilization often leads to digital divide. Digital divide separates the information-rich and the information-poor within or between different organizations in the industry. The Organization for Economic Co-operation and Development defines the digital divide as the difference between individuals, households, businesses and geographic areas with regard to their opportunities to access ICTs and their use of the Internet for a wide variety of activities. It is the gap between those who have real access to information and communications technology and who are able to use it effectively, and those who don't have such access (Bridges 2002). This 'digital divide' has implications on the relative positioning of individuals as well as firms in the banking industry and eventually influences organizational structure of the industry.

Organizational Structure

Organization is a process of dividing work into convenient tasks or duties, of grouping such duties in the form of posts, of delegating authority to each post, and of appointing qualified staff to be responsible that the work is carried out as planned (Hall, 1979) An organization coordinates work through a structured hierarchy and formal, standard operating procedures. This structure reveals a clear-cut division of labour where experts are employed and trained for different functions and arranged in a pyramid of rising authority and responsibility. Structural characteristics of Organizations include:

i. Clear cut division of labor or specialization
ii. Hierarchy (arrangement of specialists in hierarchy of authority) with everyone being accountable to someone and authority is limited to specific functions
iii. Explicit rules and procedures that limit authority
iv. Impartial judgments based on rules
v. Technical qualifications and positions as basis for recruitment and promotion
vi. Maximum organizational efficiency that results in maximization of output with limited resources

These structural principles (See Appendix 1 for more detailed discussion) have been discussed by various scholars. Lucey (1997) states the main traditional principles of organization as principles of correspondence, specialization and division of work, unit of command, span of control or span of supervision and scalar or hierarchical principle. Adeshina (2001) also identifies the structural principles of organizations as division of work, unity of direction, centralization, authority and responsibility and scalar chain.

Generally speaking, organizations are arranged via line or functional structure or a variant of the two. In the line organizational structure, **a**uthority is embedded in the hierarchical structure, and it flows in a direct line from the top of managerial hierarchy down to different levels of managers and subordinates and to the operative level of workers (Chandan, 2004) The lines of authority and responsibility are direct between the senior and subordinate at each level within the organizational structure (Hall, 1979). Organizational structure identifies authority, responsibility and accountability at each level and connects positions and tasks to those below it. There is a clear unity of command in this system. In a pure line set-up, all similar activities are performed at any one level. Each group is self-contained and is independent of the other units, and is able to perform the assigned duties without the assistance of the others (Chandan, 2004). In functional organizational structure, certain functional relationships exist (Hall, 1979). This organization permits specialist in a given area to enforce his directive within the clearly defined scope of his authority. He can make decision and issue orders to persons in divisions other than his own, with a right to enforce his advice.

A variant of line or functional structure is the Matrix Organizational Structure. Koontz et al (1986) Matrix organization uses cross-functional teams to respond to increasing complexity associated with organizational growth (Chandan, 2004). It integrates the efforts of functional and project managers and combines vertical and horizontal lines of authority to ensure flows both down and across. The line structure stands for the vertical pattern where authority flows down from superior to the subordinate. The project authority flows across (horizontally) because the authority is really assigned for coordinating efforts rather than giving orders. The project managers give direction and integrate activities and resources related to the project.

Digital Revolution and Organizational Structure

Organizations and information systems influence one another. The interactions between them are very complex and influenced by many mediating factors such as standard operating procedures, politics, culture, surrounding environment and management decisions. Behavioral theorists believe that digital revolution is capable of changing the organizational balance of rights, privileges, obligations, responsibilities, and feelings that have been established over a long period of time. They focus on how technology affects organization's inner working. Information system is therefore seen as the outcome of political competition affecting

authoritative allocation of resources. It affects who does what to whom, when, where and how. To them, technological change requires changes in who owns and controls information, who has right to access and update information and who makes decisions about whom, when and how. They further argued that the advent of digital revolution could change the hierarchy in decision making. This happens because authority relies on knowledge and competence and not on mere formal position. This paper studied the effects of digital revolution on the organizational structure of banks in Nigeria. Specifically it examined structural changes in the line and unit of command and determined the impact of digital revolution on the right sizing of staff. Effects on the structure of the industry were also examined to determine changes in competitive strength brought about by the adoption of ICT.

Twenty-five banks were selected from the southwestern part of Nigeria for the study. The choice of southwestern Nigeria was informed by the concentration of the headquarters of all the banks in that part of the country. Questionnaires were developed for the staff and a five-point Likert scale was used to determine their attitudes and opinions on the effects of digital revolution on the organizational structure of banks. Interview was also conducted with the top and middle managers in the studied banks. Mean was used as an indicator of central tendency in quantitative variables that have frequency distributions in the study.

Findings and Analysis

Table 1 shows the responses of bank workers on the effect of digital revolution on the structure of the organization. The responses of the staff highlighted expected behavioural changes resulting from the adoption of ICT in the banking industry. With a mean of 4.25 out of a maximum of 5, the respondents believed that authority relied on knowledge and competence and not on mere formal position. This implied a change in the hierarchy of decision making. This agreed with (Malone 1997) that IT could change the hierarchy of decision making in the organisations. Similarly, the respondents believed that the adoption has altered required skills and created the need to train and retrain workers. This agreed with The Economist (November 3, 2001), that

> The knowledge workers, collectively, are the new capitalists. Knowledge has become the key resource, and the only scarce one. This means that knowledge workers collectively own the means of production…. Knowledge workers… see themselves as equal to those who retain their services, as 'professionals' rather than 'employees'. The knowledge society is a society of seniors and juniors rather than bosses and subordinates…..The knowledge society is the first human society where upward mobility is potentially unlimited'.

The respondents said that ICT encouraged direct report to managing directors by lower level managers. This position was in consonance with Laudon and Laudon (2001) who claim that IT could bring information directly from operating units to senior managers, thereby playing down on the roles of middle managers.

Table 1 Attitude of Bank Workers towards the Adoption of ICT Devices

	N	Mean	Std. Deviation	Minimum	Maximum
Computer literacy offers no unique advantage to workers in banking	194	1.54	.85	1	5
Fear of redundancy and retrenchment grips computer illiterate bank workers	193	3.40	1.10	1	5
ICT application in banks has altered skills in industry	194	2.82	1.28	1	5
Fewer workers are needed in banks using IT devices	191	3.22	1.06	1	5
Authority relies on knowledge and competence and not on mere formal position	195	4.25	.85	1	5
Trend of recruitment and promotion in banks favours people with computer engineering background	193	4.20	.80	1	5
ICT application in banks has not affected the size of the work force	191	2.93	1.05	1	5
Need to train bank workers in order to make them IT literate	195	4.25	.85	1	5
Computer education assists in solving basic operational & planning problems	194	3.39	.93	1	5
Adoption of ICT has improved the competitive edge of banks	195	4.27	.64	2	5
Adoption of ICT encourages direct report to M.Ds by the lower level managers	195	3.75	. 1.04	1	5

Source: Research Survey

The respondents supported the view that fewer workers were needed with the adoption of ICT. This has implication for staff restructuring which may call for down sizing. Firms can downsize to the point of producing their main competence and purchasing everything else they need from outside. Thus, instead of massive corporations, digital revolution encourages small and highly focused corporations that farm out production to their allies. This is also known as network production.

They also agreed to the potential fear of redundancy and retrenchment for workers who are not computer literate. This agrees with Rifkin (1995) that the rise of productivity as a consequence of ICT deployment affects the amount of time worked in two ways. First, labor and time saving technologies have allowed companies to eliminate and dismiss workers en masse. Second, those who manage to hold their jobs are made to work longer hours. For firms, a smaller workforce means saving on the cost of providing benefits such as health care. Drucker (2002) tracing the history of industrial revolution suggests that workers will not disappear; only particular kinds of workers will. There will always be room for workers, but the areas or fields of demand may change. With digital revolution the most demanded and sought after workers will be information technology (IT) professionals. Reich (2001) points out that the others workers that will thrive with IT professionals are the "symbolic analysts" such as engineers, attorneys, scientists, professors, executives, journalists, consultants and other "mind workers" who engage in processing information and symbols for a living. They will occupy a privileged position in that they can sell their services in the global economy. In an economy where information is critical, symbolic analysts or "knowledge workers" will also constitute an elite group. In the banking industry, they serve as consultants and also influence the process of decision making.

Table 2: shows the impact of the adoption of ICT products on competitive strength, market segmentation, improved revenue, proper forecasting and modernisation. Respondents believe that ICT impacts positively on all these criteria. The calculated mean of 4.86 out of a maximum of 5 shows that adoption of ICT in banks improves competitive strength. Similarly, it enhances proper market segmentation (4.24), improves revenue (4.18), ensures modernisation (4.69) and proper forecasting (4.30). All these have brought about changes in the positioning of various banks in the industry. Some of the 'big four' (the first four banks) in Nigeria have been replaced mostly by those who have been able to utilize the advantages provided by digital revolution. The positive impact of ICT on revenue corroborates the findings of Laudon, and Laudon, (1991) that studied the entire cash flow of most fortune 500 companies and linked their success to Information System. They concluded that Information Technology directly affects how managers decide, how they plan and what products and services are produced. This provides good leverage for gaining a commanding height in the industry.

Table 2: Induced Impact of ICT in Banking Industry

		x	f	fx	$\bar{x}$	%
a.	Need for Competitive Strength					
	Highly Responsible	5	30	150		85.7
	Responsible	4	5	20		14.3
	Fairly Responsible	3	-	-	4.86	
	Hardly Responsible	2	-	-		
	Not Responsible	1	-	-		
b.	Need for Market Segmentation					
	Highly Responsible	5	15	75		44.1
	Responsible	4	14	54		41.2
	Fairly Responsible	3	3	9	4.24	8.8
	Hardly Responsible	2	2	4		5.9
	Not Responsible	1	-	-		-
c.	Need for Improved Revenue					
	Highly Responsible	5	17	85		50.0
	Responsible	4	9	36		26.5
	Fairly Responsible	3	5	15	4.18	14.7
	Hardly Responsible	2	3	6		8.8
	Not Responsible	1	-	-		
d.	Need Proper Forecasting					
	Highly Responsible	5	17	85		51.5
	Responsible	4	11	44		33.3
	Fairly Responsible	3	4	12	4.30	12.1
	Hardly Responsible	2	-	-		-
	Not Responsible	1	1	1		3.0
e.	Need for Modernisation					
	Highly Responsible	5	26	130	4.69	72.5
	Responsible	4	7	28		20.0
	Fairly Responsible	3	2	6		5.5
	Hardly Responsible	2				2.5
	Not Responsible	1				

Source: Research Survey, 2006.

Discussion

Interview conducted with managers of the banks revealed that all the banks appreciate the importance of ICT. There is a growing rate of adoption of ICT devices and innovative efforts towards discovering new products for competitive strength. They are encouraged that digital revolution has facilitated a rapid drop in cost and rapid expansion of power of digital devices such as computers and telecommunications. Most of the managers interviewed talked about the on-going process of automating most of labor intensive and repetitive processes in the industry. This flows with the thought of economic theorists that as the cost of IT falls it is substituted for labor. In the microeconomic model of the firm, it is argued that digital revolution should result in decline in the number of middle managers and clerical workers. It is further argued especially by the transaction theorists that the revolution helps firm to contract in size. This supports the view of the respondents in the studied banks. The use of network particularly assists the industry to lower the

cost of market participation. Agency theorists also supported this view by pointing out the avoidance of missing costs of agency or coordination/supervision costs. Inherent in these theories are the assumption that the declining costs of information technology and its ability to substitute for some human efforts may lead to decrease in the number of employees, improve the quality of products and market coverage. Responses of the banks' staff buttressed this view. This also agrees with the concern expressed by the U.S Commerce Department in its study of 1999 stated as follows:

"For more than 15 years, employment in the core IT occupations—computer scientists, computer engineers, system analysts and computer programmers—has grown at an astounding pace. The growth rate for computer scientists and system analysts has even accelerated in recent years. -The recent downturn has not changed this trend; it has only slowed down the demand. Will the widespread introduction of ICT lead to mass unemployment?"

The flattening effects of digital revolution are also apparent on the studied banks. Tall structures have been discovered to be inefficient, slow to change and less competitive. Organizations are becoming flatter in the studied banks and employees are scattered over wide geographical locations coordinated by wide area network arrangement. Span of control has been broadened – managers can control more workers spread over long distances. Digital revolution permits senior managers to contact lower level operating units directly using networked telecommunications and computers, thereby eliminating middle management intermediaries. It also encourages direct report to top level managers by lower level managers. Computers on the desk of operational managers are networked with the central computers in the top managers' offices and they don't have to pass through the middle level managers to get report to the top. This has effects on the unit and line of command. More information is made available directly to line workers thus empowering them to make decisions previously made by their managers. With digital revolution classical view of the unity of command and the scalar principle of classical organization cannot be sustained given network arrangement that allows access to information and direction from more than one boss. Some organizations need to reduce the number of levels in their hierarchies and number of employees to benefit optimally from the opportunities provided by the revolution. Digital revolution also encourages team work by enhancing the ability to organize globally while working locally through the use of e-mail, internet, and video conferencing Team members can collaborate closely even from distant locations.

ICT impacts positively on competitive strength, market segmentation, improved revenue, proper forecasting and modernisation. Digital revolution brought some behavioural changes in the banking industry. The adoption has also altered required skill and thus put the computer literate junior officers at an advantage. Other workers need to train and retrain to be relevant to the industry. Fewer workers are needed with the adoption of ICT and this has implication for staff restructuring which may call for downsizing or rightsizing. This has led to fear of redundancy and possible retrenchment especially among workers who are not computer literate**.**

Summary

The study revealed fundamental changes in the structure and content of banking business in the country and revealed technology as the main driving force of competition in the banking industry. Without doubt, digital revolution is changing the

course of history and all banks should equip themselves with better information and policies that would enable them join the race. Banks should address the effects of digital divide and strengthen their technological innovation. Banks that do not undertake measures to enhance their ICT infrastructure risk not just being marginalized but also being completely bypassed in the new global order. Banks must ensure that investments in ICT generate business value and mitigate the associated risks.

This calls for the implementation of organizational structures with well defined roles for addressing the issue of digital revolution. This is usually not an easy task. Because information system potentially changes an organizations structure, culture, politics, and work, there is a considerable resistance to new changes by those whose positions are threatened. The perceived emergence of the knowledge workers (IT Professionals), majority of who may not be among the top managers, into a decision making class, may constitute opposition to the required change in the industry. Besides the middle level managers that might be thrown out of relevance given the new network arrangement in the flow of information will not want to allow 'Tall' structures to be easily substituted with 'flat' ones. Lewin's three-stage approach to changing behavior which was elaborated by Schein (1964) and quoted by Cole (2002) can be adopted. The first stage is to 'unfreeze' existing behavior by providing a convincing motive for change. There is need to provide real motivation to move away from the status quo. Let people see that change is not only necessary but desirable for the organization. The second stage is 'changing or developing new behavior' by encouraging them to identify with more appropriate and beneficial behavior. The third stage is to 'refreeze' and it focuses on the consolidation of the new behavior by providing various rewards from the organization which includes an assurance for proper settlement of any officer that might be affected by the restructuring.

Conclusion

Digital revolution has changed the course of history in the banking industry and has left far reaching effects and implications on both the organizational and industrial structure. It is imperative for banks and their staff to effect proper restructuring that will facilitate optimal utilization of the benefits provided by the revolution.

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Appendix 1

The Scalar or Hierarchical Principle

This refers to a vertical division of authority and responsibility within an organization. The principle states that a graded chain of superiors from the ultimate authority to the lowest rank exists. This connotes an unbroken flow of authority from the top to the bottom of the organization. All communications must pass through each subordinate until it reaches the appropriate level.

Principle of Span of Control or Span of Supervision

This principle emphasises the need for a superior to coordinate the activities of subordinates. It specifies the number of subordinates a superior can effectively supervise. The span narrows down at the lower levels of the hierarchy where activities are routine and repetitive.

Principle of Unit of Command

Activities which have the same objective should operate according to one plan and should be directed by one manager. This principle implies that a subordinate should receive order from only one supervisor.

Principe of Specialization and division of work

This principle focuses on the division of work process into small tasks or areas. This enables people working repeatedly on the same task to gain proficiency and become specialists. This has been recognized as a natural means to produce more and better work with the same effort. It reduces the number of objects to which attention and efforts must be directed.

Principle of Correspondence

This principle relates authority with responsibility and states that they should be commensurate with each other.

Principle of Centralization

This focuses on an optimal balance that exists between centralization and decentralization which cannot be determined without reference to the capabilities of managers, who are appointed to coordinate the departments.

Principles of Authority and Responsibility

There must be some relationships between the responsibilities of managers and the authority that they exercise. The desired relationship is equality between the two. If one is expected to direct the effort of subordinates, one should also be delegated the right to give order and the power to secure compliance (exact obedience).

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Dr A.A.Agboola is a Senior Lecturer in the Department of Management and Accounting, Obafemi Awolowo University, Ile-Ife, Nigeria. He obtained a B.Sc. (Hons.) in Political Science in 1984, Masters in Business Administration (MBA) in 1988, Post Graduate Diploma in Computer Science in 1991, M. Phil in Business Administration in 2001 and PhD in Business Administration in 2006. His research focus covers business administration, financial management and general management. To sharpen this focus, he has written several articles on the application of information and communication technology (ICT) in business organizations, productivity in farm business enterprises, and budgetary procedures and control. He has also extended his research efforts to the

productivity of resource use in women dominated farm business. He has over 17 years of teaching and research experience in the university system. His modest contribution can assist small and medium enterprises to understand and explore various opportunities provided by ICT to sustain competition and improve performance.

Dr. D.O. Yinusa

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Mrs O.O. Ologunde

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