

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT): A TOOL FOR INDUSTRIAL REVOLUTION NEEDED IN THE 21ST CENTURY

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Abstract

In Nigeria today, Information and Communication Technology is a concept that rings a bell in the ears of an average literate Nigerian, even though he may not be able to say exactly what this is all about. Similarly, Industrial Revolution is also another important concept in the lips of many average literate Nigerians, both within and outside the government. Indeed, many had insisted that the bane of Nigeria development in the 21st century is our lack luster industrial revolution drive. This paper examined these two concepts closely and posited that there is a positive relationship between them. In fact, after a review of various aspects of our industrial revolution thrust, the paper concluded that Information and Communication Technology is an indispensable facilitator towards a sustainable National Industrial revolution needed in the 21st century.

Introduction

Up to the era of the 21st century, Nigeria is a nation with multifarious problems. These problems range from social, economic, industrial and technological, religious, infrastructure and the like. Among these problems, industrial related problems seem to stand out clear from others. This assertion is informed by the fact that if the industrial related problems are effectively addressed in the country, some of these other problems enumerated, such as economic, technological, social, etc, would have been adequately taken care of too.

In this regard, Nigeria needs an all- encompassing Industrial revolution in other order to put her on the world map of industrialized nations.

In the past, various governments in Nigeria had introduced some programs or fiscal policies aimed at turning round the nation's industrial fortunes. However, these steps had not yielded the desired results for quite a number of reasons.

Today, Information and Communication Technology (ICT) can be described as a colossus driving different fields of human endeavour to the promised land. Nigeria can avail herself of the unlimited facilities provided by ICT to re-launch the nation into a new Industrial revolution era.

This paper, therefore, takes a look at how ICT could serve as a major tool for the nation's new industrial revolution thrust in the 21st century.

Concepts of Information and Communication Technology

Information involves knowledge acquired in any manner, ideas and facts that have been communicated or any refined data that can be stored and retrieved in a machine-readable form (Weiner, 1990). Communication is disseminating of information to others. Communication Technology presents many opportunities for transmitting and receiving information. It gives one access to many resources. Technology brings up an important issue, the CONNECTIVITY.

Connectivity means that you can connect your microcomputer by telephone or other telecommunications lines to other computers and source of information almost anywhere. Connectivity makes it possible for the following facilities to be available. These include, fax machine services, electronic mail, voice messaging systems, shared resources, database, etc.

Information Technology, according to Weiner (1990), is seen as the means of acquisition, processing, storage and dissemination of Information by a combination of computers and telecommunication tools and techniques.

Information technology supports activities involving the creation, storage, manipulation and communication of information. Hence, it is a broad based technology needed to support information system.

Sambo (2002) defines ICT as a generic term referring to the technologies used in collecting, storing, editing and passing an information in various forms. The importance of information in the determination of man's activities becomes a widely acclaimed fact. For instance, man cannot act without adequate supply of information. Hence, information has won for itself the sobriquets: "The

linchpin to economic growth", "the life blood of cultural development", "the key to revolution," e.t.c. (Kola, 2004). Indeed, information is needed to ensure that changing societies make wise decisions. Therefore, it has the pride of place being a prime factor in decision making and revolution.

ICT As A Means To Industrial Revolution

Industrial Revolution is a change in industrial sectors aimed at increasing productivity and efficiency. It explores ways in which the combined knowledge, experience, resources and technologies of the public and private sectors could be harnessed to create positive and sustainable changes in industrial sectors (Sambo, 2002). Technology can introduce new ways businesses compete with each other. Some of the principal technological evolution that can enhance industrial revolution include:

- 1) **New Products:** Technology creates products that operate faster, price cheaper, are often of better quality, and wholly new.
- 2) **New Enterprises:** Technology can build entirely new businesses. An example is the availability of facsimile. Now chains of quick print and photocopying shops offer fax services.
- 3) **New Customer and Supplier Relationships:** Businesses that make their information systems easily available may make their customers less likely to take their business elsewhere (e.g. overnight delivery services).

ICT Potential And Industrial Revolution

ICT has the potential to offer significant support to industrial sectors by:

- 1) Providing a standard information technology system.
- 2) Providing sound infrastructure and financial strength.
- 3) Exploiting qualified marketing strategy.
- 4) Ensuring excellent contacts in private, public and government sectors.
- 5) Ensuring facilities maintenance and management, i.e. to impart the latest skills and knowledge in information system that is peculiar to facilities management.

Opportunities Available to the Industrial Sector Through the Use of ICT

ICT mostly pertains to internet services. Internet is the world's largest computer network; the network of networks, scattered all over the world to link government, schools, industries, corporations, etc, together for the purpose of creating global community. The internet changes the pace of research and development pretty fast to ensure industrial revolution.

The internet helps the industrial sectors in three obvious ways.

- 1) **To get Information:** Industrial sector can get information about people, products, organizations, research data etc from the Internet
- 2) **Providing Information:** This is placing of advert on - line. For organizations or industries, setting up a home page is a good way to let the world know what products and services one could offer. -
- 3) **Compiling Information:** It is a special case of "getting" information. Using forms, e-mail, one can conduct surveys and get opinion of people across the world. Meanwhile, Electronic mail allows messages to be sent from a sender to the receiver. It is one of the most popular opportunities provided by ICT. It is much more convenient and economical than the conventional mail (also called snail mail). Furthermore, the World Wide Web (W W W) provides an ideal medium for industries to create awareness about their existence through establishment of websites. The purpose of websites is to disseminate information to the public in a fast and efficient way, and to show the status of various activities online and instantaneously. Industrial websites contain Information about services, sales / sales administration and product planning, which is accessed by customers through the INTERNET. Therefore, if Industrial sectors would want to survive, thrive and compete favorably in this 21st century, they must embrace the facilities provided by ICT, one of which is *Internet connectivity*.

4) Impediments to Effective Utilization of ICT Facilities for the Nation's Industrial Revolution

- 5) **(i) Low level of Technology Education:** In Nigeria, studies have shown that many end users of ICT potentials and opportunities are far from being literate in information and communication technology and therefore cannot enjoy the benefits offered by this modern

technology (Salau, 2003; Sambo, 2003). Government has a significant and strategic role to play to ensure that all her citizens understand the nature of the problems resulting from their lack of adequate knowledge on ICT and ways ICT could enhance their standard of living in this era of 21st century.

6) (ii) **Inadequate Basic Infrastructure:** To use Information and Communication Technology in industries and elsewhere, certain basic facilities must be put in place and a workshop will also be organised to impart knowledge and techniques required to carry out preventive and productive maintenance to avert the breakdown of critical equipment and machinery.

7) As mentioned earlier, there are indications that a vast majority of workers in Nigerian industrial sectors cannot make use of ICT facilities. This is understandable in the sense that workers cannot make use of materials that do not exist in the industries. *The Guardian News* paper of Tuesday, October 29, 2002 observed that access to internet and other IT relevant tools to industries are very limited in Nigerian industries. Over ninety percent of industries in Nigeria are without ICT tools, including the internet. The high cost factor has practically made accessibility to ICT facilities in and out of industrial environment an exclusive preserve of the rich. More importantly, the availability of efficient telephone system as well as constant and qualitative power supply are necessary for the successful ICT usage. It is a deplorable fact that electricity and telephone lines are not available in most industries and where these are available, incessant power outages and blackouts will increase the recurrent cost of the use of technology by increasing maintenance of equipment.

8) This situation is perhaps caused by the inability of government to fully understand and appreciate the necessity for investing in technology development, which, could serve as an instrument for national development including industrial revolution. As the world rapidly moves into one global electronic village, we are with decision to join the global village with the massive investment in technology in all sectors or be left out in the cold. With a cohesive and strategic IT policy, the government can adopt a proactive measure by investing in information technology for national development as well as provide a direction for the development of our human resources in this regard. Therefore, for effective utilization of ICT facilities for the nation's industrial revolution, the government must ensure infrastructure readiness and also continue to review and monitor the process.

9) (iii) **Inadequate Technical Support Staff:** All over the industrial sector, there is acute shortage of ICT technicians and personnel. As of today, Nigeria will need to educate and produce about one million cutting - edge computer scientists and engineers annually and perhaps millions of computer literate ICT users to compete with the rest of developed world. Currently, we do not have the commensurate institutional framework, policy and strategy to crunch that number. Due to the astronomical speed of ICT development and the rapidity of change, it has become impossible for developing nations like Nigeria to educate and train the commensurate number of ICT technicians and personnel necessary to meet the need of the nation in order to compete favorably in ICT driven global revolution. Hence, Nigeria should not adopt rigid ICT human resource / skill development policies in order to bridge the gap between ICT skills demand and supply.

10) (iv) **Low Level Funding:** Funding is a major constraint for making the nation's industrial sector ICT - compliant. The cost of ICT equipment to which reference has already been made is a problem to be considered. The initial acquisition cost of computers, its accessories, telecommunication equipment, software and maintenance costs will definitely determine the usage of this valuable and necessary technology in Nigerian industries. The current level of funding of industries, coupled with general attitude of our policy makers do not give confidence to predict the wide spread use of ICT in the Nigerian industrial sector. For the industrial sector to shut eyes is to play the ostrich. Therefore, all tiers of government must be involved in providing adequate fund for the much desired availability of ICT facilities for the nation's new industrial revolution.

Recommendations

Nigeria must be a nation in a hurry to build a strong ICT infrastructure required for Industrial revolution in the 21st century to drive towards economic supremacy that will involve creating new machines and experimenting with more efficient manufacturing techniques. Hence, there are certain

recommendations, which need to be considered in order to achieve the mission of ICT for industrial revolution.

- 1 ICT should be placed on the front burner of priority among the sectors of government activities since it is a very important cord that runs across all the sectors of the economy including the industrial sector. For instance, with ICT, the domestic worker with his simple hand tools would gradually give way to a factory worker who is able to handle a complicated machine.
- 2 The government should consistently promote and encourage local development/provision of ICT infrastructures. A way to that can be by removing trade polices that discourage importation of ICT equipment and consumables.
- 3 Seminars and workshops should be organized regularly by the Nigerian Communications Commission in conjunction with other relevant stakeholders in ICT as a follow - up to educate people on how to use some ICT equipment to position themselves better and get good value for their investments.
- 4- Government should encourage the study of computer in schools especially at the basic level of education.

Conclusion

The discussions above have been able to indicate that ICT is a veritable tool for a re-launch of Nigeria's new industrial evolution in the 21st century.

Measures should be taken to reorganize our industrial sectors to realign with the import of the JCT, which is a new world order in all spheres of human endeavour.

Some of these efforts could be by training and retraining of staff in industrial sectors in line with the ICT, hosting of websites by organisations and effective restructuring of government policies in order to encourage and support investment in ICT for the nations new industrial revolution.

In this era of the 21st century, Nigeria, as a nation must embrace the ICT as an effective tool for the massive development so much touted for in our industrial sectors. And to do otherwise implies leaving our economic fortunes through industrial revolution in limbo or at best, doldrums.

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