Information and Knowledge Management
ISSN 2224-5758 (Paper) ISSN 2224-896X (Online)
Vol.4, No.9, 2014

The Role of Intensive ICT Adoption and Use on Industrial Development and the Attainment of Millennium Development Goals in Nigeria

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Abstract
The imperative diffusion and use of ICT in organizations whether service or manufacturing is not negotiable. In as much as organizations sees relevant ICT facilities as driven force to fortify work performance and productivity in order to attain organizational goals. It exploited the Socio-Technical management theory to explain the work; four (4) manufacturing industries that adopt and use ICT facilities in the city of Ibadan were selected for this research. About 336 workers were administered with questionnaire for this study. The quantitate data was analysed using SPSS and ZY index ahile the qualitative data was analysed using content analysis. This paper further showed the connections between industrial sector and the use of ICT facilities and attainment of MDGs in Nigeria. The inventory of ICT facilities in the organizations was investigated. It was discovered that most of organizations especially indigenous manufacturing industries adopt low level of ICT facilities. The paper identified some of the problems organizations in developing nations encountered which undermine rapid industrial development and may mar the attainment of MDGs in Nigeria such as: lack of effective internet connection, high capital investment on ICT facilities, low level of economic development, and ineffectiveness of NITEL and epileptic power supply and poor knowledge, lack of refresher course and poor attitude towards ICT adoption and use. The paper concluded that there should hence be an urgent and sharp paradigm shift from the local approach to work processes that characterized almost all indigenous companies in Nigeria by adopting and using relevant ICT facilities. Hence, the MDGs and the 7-points agenda of the Federal Government will be a tall dream and the vision 20-2020 may not see the light of the day. Therefore, there is the urgent need for some international organizations to assist local or indigenous organizations both service and manufacturing to get access to and afford the application and use of necessary ICT facilities in order to facilitate rapid industrial development and quick attainment of the MDGs.
Keywords: ICT, Vision 20-2020, Intensive and Non-Intensive ICT Users and MDGs.

Introduction:

The use and deployment of Information and Communication Technology (ICT) has improved the efficiency and flexibility in providing services and many organizations today are increasingly relying on ICT which evidently handles a very critical part of the organizations' core services. This is because of challenges organizations face one of which is, keen/ or stiff competition with other companies by replacing the traditional forms of operations with the modern one in order to satisfy the demands of the customers appropriately as at when due to make their products/ or services have reckoning quality in the global market as a form of benefit to developing nations (Madeley, 2000). Aina (1996) defined the global market as a presence, the process of "making global", being present worldwide, 'at the world stage" or "global arena". In his own view, Aluko (2002), sees it as simply visibility, immediacy, or availability, as make their products/ or services available in the world market.

The revolution of Information and Communication Technology (ICT) as diffused/ or adopted and used does not exempt any organization globally because all organizations contribute to the growth and development of the larger society at varying degrees (Santha, Mahendhiran and Muthi, 2006). The striking international developments in the last five decades is the emergence of newly industrialized countries propelled by high investment in technology that best improve their specified work.

There is a keen nexus between ICT adoption and use and the realization of the Millennium Development Goals (MDGs). This is because there is nothing that cannot be done without the use of computer. The use of relevant ICT facilities in different sectors in relation to the MDGs cannot be over emphasized. The importance of technology and technical change in industrial development cannot be overemphasized. It is a known fact that Small and Medium Enterprises (SMEs) are the driving force in industrial development. They comprise more than 90% of all enterprises in the world and are on average providing 60 to 80% of total employment, thus help

to contribute to Millennium Development Goals, in particular poverty eradication (MDG 1) societal development. In today's information society, the competitiveness of SMEs largely depends on their having access to reliable and relevant business information to enhance productivity and facilitate market access. However, in most developing countries, the availability of reliable information and access to information is limited. The existing information support infrastructure in developing countries is often unable to provide these information services by itself. Hence, there is a need to assist the developing countries in the establishing sustainable and dependable business information services (UNIDO, 2003).

It is to this end that this articles seeks to investigate/or assess the nexus between the application and use of ICT facilities and the development of the industrial sector through the attainment of realization of the Millennium Development Goals (MDGs) by 2015.

Research Methodology

This research purposively selected four (4) manufacturing industries in Ibadan after several pilot surveys of companies that adopt and use ICT facilities in Ibadan. Because of the population of the industries, 25% of 1268 workers (that is, 336) were administered questionnaires to fill base on their experience with ICT use. The survey used both questionnaire and In-depth interview for this work.

Theoretical Framework

The eight MDGs that aimed to tackle the vestiges of poverty in the industrial sector as considered in this paper. That is, ICT application and use and manufacturing factors had to be addressed to achieve the MDGs by year 2015. This study realizes the contribution of ICT policies to basically industrial sector and economic development as indicated in Kozma's (2005) ICT policy framework and premises the interdependence of industry and economic factors in the realization of the MDGs through the use of ICT.

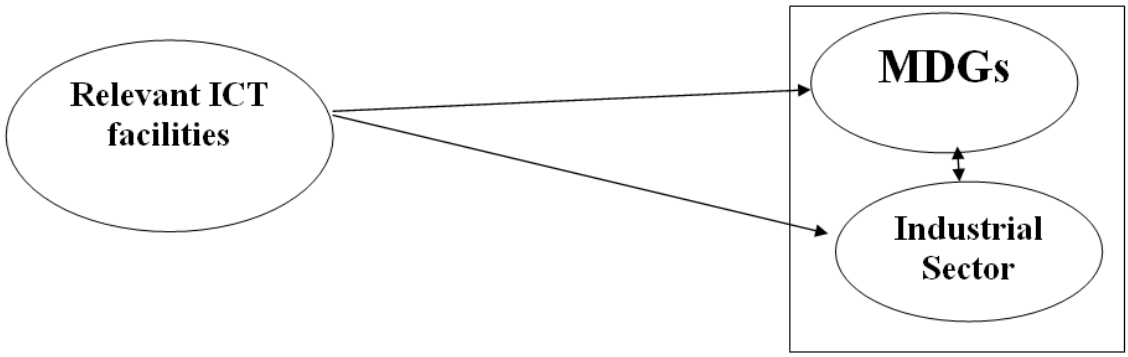

Figure 1: Showing relationship between ICT, MDGs and the Industrial Sector

To address industrial, MDGs and economic issues, ICT knowledge and infrastructure have to be extended to rural areas and establish community technology centers, and the resulting impact could differ from country to country. The internet for example, would allow for inexpensive access to resources to remote areas such as learning materials and programmes for teachers in rural areas, knowledge of modern farming, business adverts etc. The emphasis here has to be put on a deeper understanding of developing technological skills. Equipped with knowledge and skills, rural learners would for example ,be able to access information and further their literacy, use modern agricultural practices, work in nearby and the likes. In addition, the implementation strategy should be put in place for the plan to succeed. In this paper, the three components, that is, ICT, MDGs and economic developments are connected as illustrated in the diagram above (Fig. 1) to indicate that ICT is the key cardinal factor for both economic development and MDGs attainment. This indicates that the application and use of relevant ICT facilities in all existing and functioning sectors especially in Nigeria is not negotiable especially for the attainment of the 2015 benchmark MDGs which will also translate to the realization of other visions like the projected 20/2020.

MDGS and the NIGERIA CASE HOW- FAR?

GOAL 1; Eradicate extreme poverty and hunger the millennium development goals call for reducing the proportion of people living on less than S L to half the 1990 level by 2015 from 27.9 percent of people in low and middle income economies to 14.0 percent. Also to halve the proportion of people who suffer from hunger from 1990-2015.

Nigeria, the most populous African country has more than 70 percent of its citizens living below poverty

line. The Nigerian preliminary report on word bank global consultation with the poor suggests the communities in Nigeria have a rich , complex and comprehensive experience of poverty, defining it using a range of material and non-material indicator. Increasingly, communities perceive poverty as an overwhelming denial ofl their right to a quality life that is enabling and empowering with characteristics of social eclusion, vulnerability, and insecurity [WORD BANK, 1999], it is estimated by the united nations that about 20% of African `s populations recides in Nigeria and that over 50% of African investments are in the country [chinsman, 1998].

In spite of substantial economic progress and social advancement in the past thirty years, then, is still much human suffering and the country continues to face enormous challenges in setting a development agenda that meets the need of its citizenry. About, 10% of Nigeria population lives in absolute poverty [definea as earning less than %1.00 a day] with about 80% of poor residing mi rural areas [UNDP,1996;NPC , 1996]. The federal office of statistics [1999] reported that during a 17 years period [1980-1996], proportion of core poor rose five-fold from 6.2% in 1980 to 293% in 1996, with the greatest percentage increase in the period between1992and1996.Levels of urban poverty also worsened sharply from 17.6% in 1980 to 37.80% in 1985 with an all time high of58.2%[FOS,1999]. Considering the aggregate macro-levels, the gross national product [GNP] has declined fro n $ 1,000 in 1980 to 260 in 1995 placing Nigeria among the 20 poorest nations in the world [UNDP,1998]. The physical quality of life index [PQLI] RECORDED IN 1980 was 38% in Nigeria, while Kenya reported an index of 530/ ,- and Ghana and --cote d,lvoire 41% respectively [UNDP, 1996]- the united [HDI] for 1996 placed Nigeria resources. The 1998 figure was more dismal and Nigeria ranked 142 among the 172 countries assessed [oiadipo,1999].

The Nigeria demographic and healt survey [NDHS, 2003], ATTESTED to the contribution of poor nutrition and hunger on high toll rates of disability, morbidity and mortality in Nigeria . The boddy mass index also confirmed poor health indicator among women in relation to poor food intake. However, government has reportedly made several attempt at poverty alleviation. Successive regimes in the country had rolled out various programmes aimed at poverty alleviation, but these prgrammes, despite the laudable objectives of their initiators were moribund by corrupt practice some of the recent programmes include DFRRI, FSN and most recently, poverty Alleviation PROGRAMME.

THE INDUSTRIAL DEVELOPMENT CONTEX IN NIGERIA AND CHALLENGES FOR MDGS

It is essential to gain an understanding of the challenges which need to be addressed to achieve industrial development and attain the MDGs. This is informed by the characteristics of the rural areas and the significance of the rural dwellers in national development.

Table 1: MDGs, Goals and Targets

Goals	Targets
MDG 1; Eradicate extreme hunger and poverty	Target 1. Halve between 1990 and 2015 the proportion of whose income is less than $1 a day.
MDG 2; Achieve universal primary	Target 2.Halve, between 1990 and 2015, the proportion of people who suffer from hunger.
MDG 3; Promote gender equality and empower women	Target 3. Ensure that , by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.
MDG 4; Reduce child mortality	Target 4. Eliminate gender disparity in primary and secondary education, preferably by 2005 and in all levels of education no later than 2015
MDG 5; Improve maternal health	Target 5. Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate.
MDG 6: Combat HIV/AIDS, Malaria and other diseases	Target 6: Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio
MDG 7: Ensure Environmental Sustainability	Target 7: Have halted by 2015 and began to reverse the spread of HIV/AIDS
MDC 8: Develop a Global Partnership for Development	Target 8: Have halted by 2015 and began to reverse the incidence of malaria and other major diseases Target 9: Integrate the principles of sustainable development into country policies and programmesand reverse the loss of environmental resources. Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and

	basic sanitation. Target 11: Have achieved by 2020 a significant improvement in the lives of at least 100 million slum dwellers Target 12: Develop further an open, rule-based, predictable, nondiscriminatory trading and financial system (includes a commitment to good governance, development, and poverty reduction both nationally and internationally) Target 13: Address the special needs of the Least Developed Countries (includes tariff-and quota-free access for Least Developed Countries? Exports, enhanced program of debt relief for heavily indebted poor countries (HPCs) and cancellation of official bilateral debt, and more generous official bilateral debt, and more generous official development assistance for countries committed to poverty reduction). Target 14: Address the special needs of landlocked developing countries and small island developing states (through the Program of Action for the sustainable Development of Small Island Developing States and 22nd General Assembly provisions) Target 15: Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term Target 16: In cooperation with developing countries, develop and implement strategies for decent and productive work for youth Target 17: In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries. Target 18: In cooperation with the priv\te sector, make available the benefits of new technologies, especially information communication technologies

Relevance of MDGs to Nigeria

Igbuzor (2006) pointed out some important reasons why Nigeria should participate in the MDGs. According to him, MDGs provide additional entry point to engage government on development issues. It also affects all segments of the society and serves as link between government and the grassroots. It provides link between local and international actions towards human contered development. Other reasons advanced include: MDGs draw together in a single agenda issues that require priority to address the development question. Secondly, the MDGs have received tremendous endorsement and backing by world's governments and thirdly, the MDGs have the advantage of being more or less measurable, few in number, concentrated on human development and focused almost on a single date-2015. Another advantage of the MDGs to Nigeria is that it adds urgency and transparency to international developments

How ICT adoption and use assist the attainment of Millennium Development Goals (MDGs):

This aspect explains the nexus between the adoption and use of relevant ICT facilities and the realization of the MDGs.

MDG 1: Eradicate extreme poverty and hunger

ICT skills empowerment to the general public will provides an opportunity to ally unemployed graduates in the country at large poverty reduction efforts aimed at protecting the poorest and most vulnerable people male and female.

MDG 2: Achieve universal primary education

Application of ICT facilities in the educational industry will provide a level playing ground for both men and women to acquire the necessary skills to compete in the labour market. These facilities will make available an enabling environment for both sexes to study in their different area of interest. That is, enabling environment will

see all children off the street back to school especially street children in the northern part of this country.

MDG 3: Promote gender equality and empower women

Deployment of relevant ICT indicators to all sectors especially the teaching industry will enhance effective learning and provides a solid basis for promoting equality and women's empowerment as a sustainable development strategy, which at the same time is a key strategy for reducing women inequity.

MDG 4: Reduce child mortality, MDG 5: Improve maternal health and MDG 6: Combat HIV/AIDS, malaria and other diseases

The diffusion of relevant ICT facilities in the health sector (industry) to carry out necessary health processes will provide opportunities to raise the health profile of the people and improving maternal and child health.

MDG 7: Ensure environmental sustainability and MDG 8: Develop a global partnership for development

The need to create an enabling environment for all people to learn and practice what they enjoy doing is not debatable. This can only be achieved if the government at all tiers adoption relevant ICT facilities to empower the people to package themselves very well in a more international standard. Government should do all things possible to sustain this environment for the next generation.

ICT for Industrial Development

The importance of ICT in organizations whether it is service or manufacturing cannot be over emphasized. It is also note worthy that the type and volume of product an organization produce determine the relevant ICT facilities and the capital spent to adopt and make available to the workers to discharge their specialized duties. The explosive growth of ICT as a strategic tool is needed by today's organization in order to adopt new, more powerful techniques to reduce inefficiencies and improve growth and development via commitment to work. In order to understand the overall role of ICT at the organizational level, it is useful to begin by thinking about the qualitative impacts of ICT application and use in organization's production processes (Zuboff, 1988).

Nigeria as a developing nation, the application and use of ICT in organizations is still very slow compare to other African countries, this corroborate with the finding of Kolawole (2005), noted and concluded that most of organizations in Nigeria are Non-Intensive ICT users (that is, such organization of course have some ICT facilities such computer, LAN, WAN, mobile and land phones) but could not afford internet and VSAT which could give them access to the outside world. The reason according to Agboola (2006) "is due to cost, fear of fraudulent practices and lack of facilities necessary for their operations. E-HOB has not been firmly rooted in Nigeria due to the inability of many households to afford terminals and all accessories required for effective connection, high capital investment required for its operations in banks, low level of economic development, ineffectiveness of NITEL and epileptic supply of power supply".

All the above factors militate against the proper adoption and effective use of ICT in organization and even in the country at large, except for few multi-national companies and the banking sector (recapitalization exercise) were able to get all necessary ICT facilities needed to transform work process from the traditional form to the modern day type that is, via **effective communication**, these are called Intensive ICT Users. This situation is common to most organizations in Africa, the work of Richard D. and Richard H., (2001), on ICT in Small-scale Enterprises in Africa (Botswana) noted that the size of an industry influences ICT intensity within an organization. They further asserted that the intensity of ICT in any organization is a function of the organizational annual turnover the table below shows the inventory ICT facilities in most manufacturing firms in Nigeria.

Be that as it may, the status of organizations in Nigeria need to be examined in respect to availability, accessibility and affordability of relevant ICT facilities to different organization as regard to the size and what they produce/ or service render for the entire public and the global world. It is possible to access what is available and then can you really need to ask what the price of what you can access is. Thus availability, access and affordability of ICT facilities by organizations are naturally the first steps to consider when discussing on the application and use of ICT as a tool for industrial/ organizational and national development especially in Nigeria. With a mix of visionary government ICT policy and profit-motivated private-sector competition, eventually, the issue of affordability becomes less important even though availability and universal access to ICT facilities are assured compared to what was obtainable in Nigeria 4-5 years ago when most SMEs in Nigeria could not afford relevant ICT facilities (See Table 1).

Table 1:- An Inventory of ICT Facilities adopted and used in each unit in the Selected Manufacturing Industries in Nigeria.

Units in SBC	No. of workers	Computer	Telecom	Internet	Internal. Email	External. E-mail	LAN	WAN	CTCM	Televisi-	Level of ICT
Administration	68	+++	++	~	~	~	~	~	-	+	
Production	100	+++	+	~	~	~	~	~	4	-	
Marketing	150	+++	++	~	~	~	~	~	-	-	
Fleet & Transport	13	+	+	~	~	~	~	~	-	+	
Computer	10	++	+	~	~	~	~	~	-	-	
Total	**353**										**High**
Units in FCD											
Administration	50	+++	++	~	~	~	~	~	-	+	
Production	150	+++	+++	~	~	~	~	~	+++	-	
Marketing	30	++	+	~	~	~	~	~	-	-	
Engineering	14	+	+	~	~	~	~	~	-	+	
Finance	25	+	++	~	~	~	~	~	-	-	
Purchasing	25	+	++	~	~	~	~	~	-	-	
Total	**294**										**High**
Units in APL											
Administration	14	+	++	-	-	-	~	~	-	+	
Production	52	+	+	-	-	-	~	~	+	-	
Marketing	10	+	+	-	-	-	~	~	-	-	
Establishment	4	-	+	-	-	-	~	~	-	-	
Total	**80**										**Medium**
Units in NML											
Administration	41	+	+	-	-	-	~	~	-	+	
Production	389	+	++	-	-	-	~	~	++	-	
Marketing	15	+	++	-	-	-	~	~	-	-	
Engineering	74	+	+	-	-	-	~	~	-	-	
Finance	18	+	+	-	-	-	~	~	-	-	
Purchasing	4	+	+	-	-	-	~	~	-	-	
Total	**541**										**Medium**

Key: ~ = Internet connectivity - = Not available
+ = Number of occurrence indicates quantity in the industry
SBC= Seven-Up Bottling Company FCD= Friggoglass Cool Division
APL= Askar Paints Limited NML= Niger Match Limited

On the role of ICT for national development, ICTs have had a major impact on the full spectrum of commercial activities throughout the world. It is now accepted that the productivity and competitiveness of all economic sectors and their capacity to innovate in terms of products, services and processes increasingly depend on Information and Communications networks. In manufacturing, ICTs are responsible for accelerating elements of the production process to improve quality and reduce inventory levels. Computer networking has taken over localized computing all over the world thus allowing for resources and information sharing. The interconnection of computers and the internet have brought about greater efficiency and better information sharing and management. Clearly, ICT is driving the new global economy. People, businesses and communities with ready access to information technologies are better equipped to participate actively in the global economy.

In Nigeria, the banking and the communication sectors will always be a reference point in optimal use of ICT and its contribution to industrial and national development especially the national economy and participation in social activities. The importance of financial sector to the growth and development of any economy can never be over-emphasized as it could be used as the financial hub of laying the foundation for the emergence of a great economy (Olajide, 2003). The government understood the impact of ICT in the economic development and embraced it for organisational growth and national development at large.

According to Guardia (2001), banks can play a role in e-commerce at two levels. First, they together with payment and communication systems form necessary infrastructure for e-commerce. Secondly, banks can deliver

services via e-commerce. Electronic banking is one area of e-commerce that has proven successful in Nigeria (Economist Intelligence Unit, 2006). Nigerian banks are increasingly seeking to provide general banking facilities on-line. Banks have set up websites that carries corporate information and allows customers to carry out some form of transaction. Studying e-commerce activity in Nigerian banks will provide understanding of the drivers of e-commerce in Nigeria (CIA, 2006) and is a potentially lucrative market for e-commerce services. Nigeria financial sector is making a great exploit in the global market via the use of relevant ICT facilities to serve their teeming growing customers right. The Managing Director of Bank PHB Mr. Francis Auche said, "a bank in Nigeria made 5% over public offer shares and another made about N500 million more than officially public offer. The reason for this was for the fact that customers have solid and reliable confidence in some of these banks and the security of customers' financial data is well guaranteed. This goes along way to determine the level of each banks contributions to national development by participating in quite a number of social projects in the country, for instance, when Tinapa kicked off in Calabar Cross Rivers State, some banks in Nigerian financial sector donated to commissioned the international business center, Sky Bank sponsors Nigeria under-17 national team, many are into road construction, scholarships for Nigerian students to study within and outside the country etc. This is as a result of unquantifiable profit each bank makes at the end of every year via the proper use of ICT facilities for **effective and timely communication** to all stakeholders.

If all organizations service or not can borrow a leaf from the banking sector in Nigeria then national development via the use of relevant ICT facilities is guaranteed. Although some international organizations may likely come into partnership with organizations in Nigeria to make this goal a reality, for instance, the experience of the projects that have been undertaken by UNIDO for business information networking is different from one country to another. Although the core concept remained the same, a different approach is applied in each country to suit local conditions and utilize the existing SME support infrastructure. Some of the nations that have benefited from this gesture are as follows:
Egypt – BISnet: In cooperation with the Egyptian Social Fund for Development and its SME department SEDO, UNIDO has formulated a business model to establish Egypt-BISnet, a commercially operating SME business information network. The first phase of the project will include a hub in Cairo and three other regional centres.

Guatemala – MINECOnet: is to establish a national industrial information network on the basis of a common pool of SME support information and value-added services. As a first step, an SME portal was established. In the next phase, MINECOnet will be enlarged with the participation of several national partner institutions.

Uganda – UBIN: The Uganda Business Information Network (UBIN) in Uganda is a private limited company with shareholders from public and private sectors. The company provides value added information services, ICT Training and Enterprise Internet Solution. The next phase will extend UBIN into rural districts of Uganda.

Sri Lanka – ITMIN: The Industrial and Technology Market Information Network set up as a BRC in Sri Lanka, was one of the first initiatives of UNIDO to apply decentralized BISnet activities. TMIN, in addition to providing information value added services, also provides training and Internet Services, including Enterprise Internet Solutions and Internet connectivity.

There are some final points to be made here. First, it is essential to note that ICT is not all just about telephony or the use of computers, it goes beyond that and increasing telephone density and giving out computers (possibly recycled) does not amount to development per se. Secondly, to significantly enhance availability and accessibility of ICT facilities - and bring down their cost - it is essential that a stable distributed power supply (rather than so much power generation being concentrated everywhere) be obtained in the country as a matter of urgency. Thirdly, a fiber-optics backbone – especially NigComSat2 to supply an effective network to all organizations as the entry to the rest of the global information network - must be firmly established by public-private partnership in Nigeria also as a matter of urgency. Finally, a good ICT policy must be one with an appropriate standard on the application and use of relevant ICT facilities by all organizations whether service or manufacturing. Nigeria can as well have what is called NBIN (Nigeria Business Information Network) or NSMEBI (Nigeria Small and Medium scale Enterprise Business Information).

Conclusion:
In conclusion, the adoption and use of relevant ICT facilities in organization whether service or manufacturing suggest that ICT has the strong potential, if conceived as a means and not an end in itself, to be a powerful enabler of organizational development; this will facilitate easy attainment of the country's MDGs. However, the fact that ICT can, in theory, assist development in organizations and society, does not mean that it will

necessarily do so because of some nonchalant attitudes of some government at all tiers, Directors, management or managers. In order for ICT to positively engender rapid structural changes and development especially in this globalized and keenly competitive world, it must be employed as at when due and effectively used in all existing sectors and in the country at large to meet the MDGs. That is, all indigenous companies must be Intensive ICT users. Because from every indication, the possibility and probability of meeting or achieving the MDGs seems to be a very long and tall dream in Nigeria.

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