

# Using Information and Communication Technologies (ICT) to Actualize the Millennium Development Goals (MDGs) in Nigeria: A Mission yet Accomplished

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**Abstract**— Since the introduction of the Millennium Development Goals (MDGs) at the United Nations Millennium Summit held in September 2000 by the 193 United Nations, Nigeria and other member countries have been working assiduously to meet up with the 2015 target date as agreed by the UN assembly. The question of how the MDGs can be achieved within the stipulated time and the role of Information and Communication Technology (ICT) in achieving the Millennium Development Goals (MDGs) made this paper imperative. The major focus of this work is to look at the way forward by using ICT to actualize the Millennium Development Goals (MDGs) in Nigeria. This paper understudied the key challenges and uses of ICTs to drive the achievement of the MDGs with a specific focus on poverty eradication, education, gender equality, health, and environmental sustainability.

**Index Terms**— Information and Communication Technologies (ICT), Millennium Development Goals (MDGs), Nigeria, Target, United Nations

## 1 INTRODUCTION

Information and Communication Technologies (ICT) can be an extremely powerful enabler in efforts to bring positive and sustainable development to countries around the globe [1], amidst this, Planners, policy makers and researchers hold highly polarised and equivocal views on the diffusion of Information and Communication Technology (ICT), its role in promoting objectives such as poverty alleviation, universal education, reduction in mortality and health hazards, and sustainable development, and in bridging the digital as well as socio-economic divides in the world [2]. It is pertinent to note that ICTs are making dynamic changes in society. They are influencing all aspects of life [3]. Tinio [4] states the potentials of ICT as follows:

ICTs greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. One of the greatest hardships

endured by the poor, and by many others, who live in the poorest countries, in their sense of isolation, and ICTs can open access to knowledge in ways unimaginable not long ago.

As described in [5], ICTs have revolutionized the way people work today and this is a sufficient reason for ICTs to win global recognition and attention. For instance, ICTs are dependable tools in facilitating the attainment of the Millennium Development Goals (MDGs).

Though ICTs play significant roles in representing equalization strategy for developing countries, the reality of the digital divide (i.e. the gap between those who have access to, and control technology and those who do not), make a huge difference in the use of ICTs. This means, that the introduction and integration of ICTs at different levels and various goals of MDGs is the most challenging undertaking. Failure to meet the challenges would mean a further widening of the knowledge gap and deepening of existing economic and social inequalities among the developed and the developing countries [3].

### 1.1 The Concept of Information Communication Technologies (ICT)

ICT is an acronym that stands for Information Communications Technology. There are different understandings of the concept "ICT" and as such authors have given their different definitions of ICT which includes:

Blurton [6] sees ICT as "a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information while [7] sees it as "the use of information in order to meet human need or purpose including reference to the use of contemporary devices such as the Internet".

The Organisation for Economic Cooperation and Development (OECD in 1998) defines ICT as the combination of manufacturing and services industries that capture, transmit,

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display data and information electrically [8] and [9] defines it as the study or business of developing and using technology to process information and aid communications.

In all these differing definitions of ICTs from various scholars, an attempt to provide a more comprehensive definition of ICT, United Nations Educational Scientific and Cultural Organisation UNESCO (2006) gives the definition as forms of technology that are used to transmit, store, create, share or exchange information (cited by [11]). Jimoh and Salawu [11] further stated that this broad definition of ICT includes such technologies as radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computers, internet, hardware and software as well as the equipment associated with these technologies such as video conferencing, electronic mail, online banking, electronic commerce, etc.

From all indications, ICT (information and communications technology - or technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning [12]. ICTs are often spoken of in a particular context, such as ICTs in education, health care, rural development, or libraries and as such this paper is properly placed. Therefore, this paper shall explore the roles of this technology products or tools in order to achieve the Millennium Development Goals (MDGs) in Nigeria.

From all the definitions above, we can define Information and Communication Technologies (ICT) to include all the activities associated with information gathering, Information storage, Information Management, Information dissemination or communication, and the technologies that enable all these. Thus, the role of ICT in actualizing the MDGs would imply how the application or integration of these items listed under ICT definition in the preceding sentence above, in the national agenda, would ensure significant national development.

## 2 Outline of MDGs

At the United Nations Millennium Summit held in September 2000, World leaders agreed to a set time-bound and measurable goals and targets. In the end, there are eight (8) goals, eighteen (18) targets and forty-four (44) indicators. The essence of these goals is summarized in table 1 below:

The aim of the MDGs which were agreed upon by all the 193 United Nations member states including Nigeria and at least 23 international organizations is to achieve these goals by the year 2015; to encourage development by improving social and economic conditions in the world's poorest countries [13]. Hence this paper shall explore how ICT can be used to achieve each of the goals.

## 3 THE ROLE OF ICT IN ACHIEVING MDGS

### 3.1 The Role of ICT to Goal 1

So far, government has made substantial input towards achieving this goal through deregulation of the telecom industry. This has led to reasonable proportion of Nigeria's population moving into the telecom sector either as importers of tele-

com equipment, distributors, retailers, maintenance engineers, marketers, etc. Each of these constitute job field that can accommodate many people, thereby increasing income base which implies elimination of extreme poverty and hunger. On the other hand, the existence of the internet has also increased access to market since a lot of products and services can now be accessed over the internet as against the traditional markets.

### 3.2 The Role of ICT to Goal 2

ICT can be adapted into the educational system through digitizing of teaching techniques. Audio enabled textbooks and other relevant study materials can be utilized to enhance understanding.

ICT can be very useful in carrying out a survey to determine what percentage of the population is educated and vice versa. Data mining techniques can be applied to come up with information that could be useful for government decision making which could increase government's budgeting in the area of education. ICT also broadens sources of quality educational materials and resources.

### 3.3 The Role of ICT to Goal 3

The normal mobile phones, computer systems, televisions, and other electronic gadgets which are ICT tools are not gender discriminatory. This shows in one way that ICT promotes gender equality. However, this ICT equipment like the television through the media can be very useful by initiation of awareness programs that promote gender equality.

The man power for the use of the ICT equipment can be made unisex such that jobs created around this area can accommodate both men and women. Thus through ICT, jobs are created for women without any disparity. Also, ICT provides equal rights among men and women as there is no restriction in its mode of operation.

### 3.4 The Role of ICT to Goal 4, 5 And 6

The advent of mobile communications, teleconferencing facilities and multi-media capabilities of ICTs, have been of tremendous benefit in healthcare delivery. Thus, spatial differences between medical specialists, medical centers and patients have been eliminated. It has now become a common phenomenon for doctors on call duty not to be restricted to their homes waiting for a call or within the coverage distance of a local paging facility. Today the doctor on call can move freely with his mobile phone and can easily be reached, in case of an emergency, to give initial instructions on how to manage the patient while he is on his way to the hospital if necessary. With broadband facilities and video conferencing, doctors in one part of the country, or in any part of the world for that matter, can consult with other specialists in any part of the world on any medical case of interest.

The existence of health information system has been useful in the management of health care records and services. ICTs increase access of rural care-givers to specialist support and remote diagnosis, and enhance delivery of basic and in-service training for health workers as well as increase monitoring and information-sharing on disease and famine [14].

### 3.5 The Role of ICT to Goal 7

The existence of remote sensing technologies and communications networks assists in more effective monitoring, resource management, mitigation of environmental risks.

ICT can also help to ensure greater transparency and monitoring of environmental abuses/enforcement of environmental regulations; Facilitate knowledge exchange and networking among policy makers, practitioners and advocacy groups.

### 3.6 The Role of ICT to Goal 8

ICT enable LDCs, landlocked countries and small islands to link up with the global market to accelerate their progression and full integration into the world economy through the use of internet and searchlight services.

Distance working facilitated by ICT opens up opportunities to create service-sector jobs in developing countries in such industries as call centers, data entry and processing, and software development and telecentres create direct employment for men and women as well as improve youth learning skills, employability to meet the challenges of the knowledge-based global economy.

## 4 GOVERNMENTS' EFFORTS

In an attempt to actualize the MDGs, the three (3) tiers of government in Nigeria have been working tirelessly towards achieving it. Committees that have been setup to meet-up with the health needs of Nigerians includes Local Action Committee on Aids (LACA), State Action Committee on Aids (SACA), National Action Committee on Aids (NACA), National Health Insurance Scheme (NHIS), etc. For poverty reduction, the Federal, State and Local government formed National Economic Empowerment and Development Strategy (NEEDS), State Economic Empowerment and Development Strategy (SEEDS) and with the help of UNDP drafted Local Economic Empowerment & Development Strategy (LEEDS) to help provide strategies in reducing poverty and empowerment programmes to aid in reaching the rural communities in Nigeria. Government has also embarked on massive construction and renovation of schools (Education sector), hospitals and provision of portable water supply (Environmental Sustainability) to various villages, towns and recruitment of primary school teachers through Federal Teachers Scheme (FTS) throughout the states of the federation.

With the policies (efforts) of Nigerian government, the telecommunication industry has been revolutionized [15] and this has helped in connecting more Nigerians to the international community through the introduction of a number of private telecommunication operators licenced to provide both mobile and broadband services. This in return has created more employment opportunities for both men and women alike. The banking sector was not left out in that the twenty-five (25) Nigerian banks are connected to the internet such that their customers can have access to the Internet Banking system that provides wide variety of banking options.

## 5 RECOMMENDATION AND CONCLUSION

### 5.1 Recommendation

There is need to employ the expertise of a systems analyst to

understudy how ICT can be effectively implemented in remote areas especially those areas that feel that ICT impacts negatively on their culture and values. The inhabitants of these areas need to be acculturated into the ICT world for them to embrace the associated development. Therefore, while we support extensive use of ICT to achieve the MDGs, we admonish that government should adopt policies that suppress the negative trends associated with ICT such that the culture and values of the people would not be threatened by the implementation of ICT strategies.

There is also need to introduce user friendly and interactive ICT tools for learning e.g. audio enable textbooks. ICT enabled entertainment can be deployed to serve as a means of relaxation to ease off tension, and make the people happy because a happy mind can actually translate to a productive mind.

### 5.2 Conclusion

This paper has identified the nexus between the deployment of and exploitation of ICTs in realizing the achievement of the MDGs. Therefore public private partnership should be pursued in order to achieve the MDGs in Nigeria by 2015.

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**TABLE 1**  
**MILLENNIUM DEVELOPMENT GOALS, TARGETS AND INDICATORS**  
SOURCE: UNITED NATIONS (2000)

GOALS	TARGETS	INDICATORS
<b>Goal 1:</b> Eradicate extreme poverty and hunger	<p><b>Target 1A:</b> Halve between 1990 and 2015 the proportion of people whose income is less than USD 1 a day</p> <p><b>Target 1B:</b> Achieve full and productive employment and decent work for all, including women and young people</p> <p><b>Target 1C:</b> Halve, between 1990 and 2015, the proportion of people who suffer from hunger</p>	<p>1. Proportion of population below \$1 (1993 PPP) per day (World Bank)</p> <p>2. Poverty gap ratio [incidence x depth of poverty] (World Bank)</p> <p>3. Share of poorest quintile in national consumption (World Bank)</p> <p>Prevalence of underweight children under five years of age (UNICEF-WHO)</p> <p>5. Proportion of population below minimum level of dietary energy consumption (FAO)</p>
<b>Goal 2:</b> Achieve universal primary Education	<b>Target 2A:</b> Ensure that by 2015 children everywhere, boys and girls alike, will be able to complete a full course of primary schooling	<p>6. Net enrolment ratio in primary education (UNESCO)</p> <p>7. Proportion of pupils starting grade 1 who reach grade 5 (UNESCO)</p> <p>8. Literacy rate of 15-24 year-olds (UNESCO)</p>
<b>Goal 3:</b> Promote gender equality and empower women	<b>Target 3A:</b> Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels of education no later than 2015	<p>9. Ratio of girls to boys in primary, secondary and tertiary education (UNESCO)</p> <p>10. Ratio of literate women to men, 15-24 years old (UNESCO)</p> <p>11. Share of women in wage employment in the non-agricultural sector (ILO)</p> <p>12. Proportion of seats held by women in national parliament (IPU)</p>
<b>Goal 4:</b> Reduce child mortality	<b>Target 4A:</b> Reduce by two-thirds between 1990 and 2015 the under-five mortality rate (U5MR)	<p>13. Under-five mortality rate (UNICEF-WHO)</p> <p>14. Infant mortality rate (UNICEF-WHO)</p> <p>15. Proportion of 1 year-old children immunized against measles (UNICEF-WHO)</p>
<b>Goal 5:</b> Improve maternal health	<p><b>Target 5A:</b> Reduce by three-quarters, between 1990 and 2015, the Maternal Mortality Ratio (MMR)</p> <p><b>Target 5B:</b> Achieve universal access to reproductive health by 2015</p>	<p>16. Maternal mortality ratio (UNICEF-WHO)</p> <p>17. Proportion of births attended by skilled health personnel (UNICEF-WHO)</p>
<b>Goal 6:</b> Combat HIV, AIDS, malaria, and other major diseases	<p><b>Target 6A:</b> Have halted by 2015, and begun to reverse, the spread of HIV/AIDS</p> <p><b>Target 6B:</b> Achieve by 2010 universal access to treatment for HIV/AIDS for all those who need it</p> <p><b>Target 6C:</b> Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases</p>	<p>18. HIV prevalence among pregnant women aged 15-24 years (UNAIDS-WHO-UNICEF)</p> <p>19. Condom use rate of the contraceptive prevalence rate (UN Population Division)</p> <p>19a. Condom use at last high-risk sex (UNICEF-WHO)</p> <p>19b. Percentage of population aged 15-24 years with comprehensive correct knowledge of HIV/AIDS (UNICEF-WHO)</p> <p>19c. Contraceptive prevalence rate (UN Population Division)</p> <p>20. Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14 years (UNICEF-UNAIDS-WHO)</p> <p>21. Prevalence and death rates associated with malaria (WHO)</p> <p>22. Proportion of population in malaria-risk areas using effective malaria prevention and treatment measures (UNICEF-WHO)</p> <p>23. Prevalence and death rates associated with tuberculosis (WHO)</p> <p>24. Proportion of tuberculosis cases detected and cured under DOTS (internationally recommended TB control strategy) (WHO)</p>

<p><b>Goal 7:</b> Ensure environmental Sustainability</p>	<p><b>Target 7A:</b> Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources  <b>Target 7B:</b> Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss  <b>Target 7C:</b> Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation  <b>Target 7D:</b> By 2020 to have achieved a significant improvement in the lives of at least 100 million slum dwellers</p>	<p>25. Proportion of land area covered by forest (FAO)                  26. Ratio of area protected to maintain biological diversity to surface area (UNEP-WCMC)                  27. Energy use (kg oil equivalent) per \$1 GDP (PPP) (IEA, World Bank)                  28. Carbon dioxide emissions per capita (UNFCCC, UNSD) and consumption of ozone-depleting CFCs (ODP tons) (UNEP-Ozone Secretariat)                  29. Proportion of population using solid fuels (WHO)                  30. Proportion of population with sustainable access to an improved water source, urban and rural (UNICEF-WHO)                  31. Proportion of population with access to improved sanitation, urban and rural (UNICEF-WHO)                  32. Proportion of households with access to secure tenure (UN-HABITAT)</p>
<p><b>Goal 8:</b> Develop a global partnership for development</p>	<p><b>Target 8A:</b> Develop further an open, rule-based, predictable, non-discriminatory trading and financial system  <b>Target 8B:</b> Address the special needs of the least developed countries  <b>Target 8C:</b> Address the special needs of Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS)</p>	<p>33. Net ODA, total and to LDCs, as percentage of OECD/Development Assistance Committee (DAC) donors' gross national income (GNI)(OECD)                  34. Proportion of total bilateral, sector-allocable ODA of OECD/DAC donors to basic social services (basic education, primary health care, nutrition, safe water and sanitation) (OECD)                  35. Proportion of bilateral ODA of OECD/DAC donors that is untied (OECD)                  36. ODA received in landlocked developing countries as a proportion of their GNIs (OECD)                  37. ODA received in small island developing States as proportion of their GNIs (OECD)                  38. Proportion of total developed country imports (by value and excluding arms) from developing countries and from LDCs, admitted free of duty (UNCTAD, WTO, WB)                  39. Average tariffs imposed by developed countries on agricultural products and textiles and clothing from developing countries (UNCTAD, WTO, WB)                  40. Agricultural support estimate for OECD countries as percentage of their GDP (OECD)                  41. Proportion of ODA provided to help build trade capacity (OECD, WTO)                  Debt sustainability                  42. Total number of countries that have reached their Heavily Indebted Poor Countries Initiative (HIPC) decision points and number that have reached their HIPC completion points (cumulative) (IMF - World Bank)                  43. Debt relief committed under HIPC initiative (IMF-World Bank)                  44. Debt service as a percentage of exports of goods and services (IMF-World Bank)</p>