THE ROLE OF ICT IN NATIONAL DEVELOPMENT AND POVERTY ALLEVIATION

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ABSTRACT

ICT is, and will continue to be, a catalyst in advancing and development. New information and communication technologies overcome the barriers of distance and time, and significantly improve the accessibility of information and knowledge. As a result, the sharing of information and knowledge quickly and effectively becomes feasible and acts as a key element in achieving development goals and mitigating the impact of unforeseen events such as natural disasters or outbreaks of disease. These paper aims to highlight some of the benefits developing countries can derive from the use and adoption of ICT, as well as some problems they encounter and what the government of these developing countries can do to assist in the implementation of ICT.

KEYWORDS: ICT, Digital Economy, Society

INTRODUCTION

Several definitions have been given to explain and interpret the acronym ICT and the one given below seems to be the closest: 'ICTs is a generic term referring to technologies that are used for collecting, storing, editing and passing on (communicating) information in various forms.' The above definition separates distinct fields of ICTs and at the same time links them together so as to operate as an entity. It is now a fact as evidenced by developments from other countries that ICT as a sector can contribute immensely to the national GDP of a nation and that ICT, acting as an enabler, can result in improved market competitiveness of a nation's products and services. ICTs can impact positively on governance and other sectors of the economy. In turn ICT can effectively assist international economic integration, improve living standards, narrow the digital divide, and improve biodiversity utilisation and management. The digital divide characterized by highly unequal access to and use of ICT that manifests itself both at the international and domestic level, needs to be addressed by national policy makers. The digital divide can be narrowed, and poverty reduction addressed through effective and focused utilisation of ICTs in key sectors such as education, industry and agriculture.

The adoption of ICT requires a business environment encouraging open competition, trust and security, interoperability and standardization, and financial resources for ICT. This requires the implementation of sustainable measures to improve access to the Internet and telecommunications infrastructure and increase ICT literacy, as well as development of local Internet-based content. Most developing countries still depend on content developed and managed in the developed world and as a result substantial costs are incurred while trying to access the content. One of the causes that discourage access to digital information is culture and language differences. Efforts should be made to make ICTs available in local languages if they are to be demystified, adopted and utilised by locals. In general, ICT goals in Africa are: to establish an environment that encourages networking of services and applications; promoting e-commerce and trade

promotion programmes for goods and services; promoting Internet access to exchange and access digital content; establishing e-government; promoting e- education and on-line services; strengthening network security; building and developing e-society and ICT human resources.

HOW CAN ICT SUPPORT ECONOMIC DEVELOPMENT AND POVERTY REDUCTION

ICTs provide an opportunity for nations to address the digital divide and reduce poverty while registering economic growth. Developed and some developing nations have seen the emergence of a vibrant ICT sector that significantly contributes towards national gross domestic product (GDP).

A survey of firms carried out in 56 developing countries finds those that use ICT grow faster, invest more, and are more productive and profitable than those that do not. It translates into a high demand for investments and presents a tremendous opportunity for innovative public-private partnerships. (From the April 11, 2006 World Bank's home page launch announcement of 2006 Information and Communications for Development: Global Trends and Policies).

ICT has a critical role to play in development efforts around the world. However, "there was a time when the benefits of applying ICT in fighting poverty and promoting economic growth were not widely understood. Lately, however, this view has given way to an understanding of ICT as an essential component of broader efforts to harness the free flow of information to increase voice, accountability, and economic development". (2006 Information and Communications for Development: Global Trends and Policies; foreword p. xi)

ICT has changed the way people communicate, learn, and conduct business. It can help in meeting development challenges in many ways.

ICT ENABLES INFORMATION AND KNOWLEDGE TO TRAVEL FASTER AND FURTHER

ICT is, and will continue to be, a catalyst in advancing economic growth and poverty reduction. New information and communication technologies overcome the barriers of distance and time, and significantly improve the accessibility of information and knowledge. As a result, the sharing information and knowledge quickly and effectively becomes feasible and acts as a key element in achieving development goals and mitigating the impact of unforeseen events such as natural disasters or outbreaks of disease. Below are few areas were ICT has help in national development

ICT HELPS BUSINESS TO PERFOM BETTER

ICT affects economic growth in three ways. First, the ICT- producing sector plays an important role in some countries, although it is small in most. Having an ICT-producing sector can be important, since the sector has been characterised by rapid technological progress and strong demand. According to a report by the ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD,2003), In Finland, Ireland and Korea, close to 1 percentage point of aggregate labour productivity growth over the 1996-2001 period was due to ICT manufacturing. In the United States, Japan and Sweden, the ICT-producing sector also contributed significantly to productivity growth.

While the existence of an ICT-producing sector can support growth, this is not a prerequisite to benefit from ICT. Indeed, the most important benefits arise from its effective use. In particular, investment in the technology adds to the capital stock that is available for workers and thus helps raise labour productivity. Capital deepening due to ICT investment accounted for between 0.3 and 0.8 percentage points of growth in labour productivity over the 1995-2001 period.

The United States and Canada received the largest boost, Japan and the United Kingdom a more modest one, and Germany, France and Italy a much smaller one (OECD, 2003).

In some countries, notably the United States and Australia, there is evidence that industries that have invested most in ICT, such as wholesale and retail trade, have experienced more rapid multi-factor productivity (MFP) growth. The use of ICT can help firms increase their overall efficiency in combining labour and capital, or MFP. More rapid MFP growth may also be linked to network effects arising from use of ICT, as these can lead to lower transaction costs and more rapid innovation.

Detailed firm-level studies show that the use of ICT may help efficient firms gain market share at the expense of less productive firms, raising overall productivity. In addition, the use of ICT may help firms expand their product range, customise their services, or respond better to demand, in short, to innovate. Moreover, ICT may help reduce inventories or help firms integrate activities throughout the value chain. Studies for the United Kingdom, for example, show that purchasing through electronic networks can make particularly important contributions to improved productivity. Firm-level studies also show that ICT investment is only part of a broader set of changes that help enhance performance. Successful adopters of ICT and e-business strategies combine this with complementary investments, *e.g.* in appropriate skills, and with organisational changes, such as new strategies, new business processes and new organisational structures. These practices often entail greater responsibility for individual workers regarding the content and organisation of their work and, to some extent, greater proximity between management and labour (*e.g.* flatter management structures). They also involve a higher degree of outsourcing and a stronger focus by firms on their core strengths. Firms adopting these strategies tend to gain market share and enjoy higher productivity gains than other firms.

ICT use by firms is closely linked to the ability of a company to adjust to changing demand and to innovate. Users of ICT often help make their investments more valuable through their own experimentation and innovation, *e.g.* the introduction of new processes, products and applications. Without this process of "co-invention", which often has a slower pace than technological innovation, the economic impact of ICT would be more limited. This link is also visible at the aggregate level; for example, those countries that have invested most in ICT also have the largest share of patents in ICT (OCED, 2003). Firms that have introduced process innovations in the past are often particularly successful in using ICT; in Germany, for example, the impact of ICT investments on output was about four times higher in firms undertaking process innovations than in firms that did not innovate. These impacts are particularly important in services, as ICT helps firms to improve and re-invent business processes and develop new applications, thus effectively enabling innovation in this sector.

Investment in ICT is no panacea. Firms may well over- invest in ICT, either in an effort to compensate for lack of skills or competitive pressure, or because they lack a clear market strategy. Firms that achieve the highest returns from ICT are often those that were already performing well or had successfully innovated in the past. It also takes time to adapt to investment in ICT, *e.g.* by changing organisational set-ups and worker-specific skills. Firms that adopted network technologies several years ago, notably large firms, have often already been able to make the technology work, whereas more recent adopters are still adapting their organisation, management or skills. Evidence for the United Kingdom, for example, shows that among the firms that had already adopted ICT technologies in or before 1995, over 50% were using electronic networks for procurement by 2000. In contrast, of the firms that only adopted ICT in 2000, fewer than 20% made purchases through electronic networks in 2000(OECD, 2003).

ICTAND HEALTHCARE DELIVERY

The use of ICT within the healthcare sector is not entirely a new phenomenon. Studies of the National Health Service (NHS) in the UK by Gallagher (1998) noted that benefits included the ability to undertake strategic planning and better manage the healthcare environment. Rees (1998), in a similar study, noted that the use of ICT appeared to enhance efficiency. Pullen, Atkinson and Tucker (2000) showed that costs were better managed using certain forms of ICTs. These studies are supported by the findings of Nelson and Alexander (2002). It is interesting to note, however, that despite the apparent benefits, the approach to the design of ICT inclusions has been questioned by several authors who noted that many fail to fully account for all the stakeholders of the enhanced system (Waring & Wainwright 2002; Shohet & Lavy 2004; Gelnay 2002). Other benefits noted in the literature include:

- Contacting other clinicians regarding patient care (Qavi, Corley & Kay 2001; Baldwin, Clarke & Jones 2002)

- Elimination of redundancy in patient care (Pelletier-Fleury et al. 1999)

- Enhancements to the effectiveness of the practice (Andersson, Vimarlund & Timpka 2002)

- Control of economic demands (Prop 2000)

- Improved patient care (Leung et al. 2003)

- Order entry of consumables by the practice (Ash et al. 2004).

ICT AND EDUCATION

In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings. But ICTs are more than just these technologies; older technologies such as the telephone, radio and television, although now given less attention, have a longer and richer history as instructional tools.

For instance, radio and television have for over forty years been used for open and distance learning, although print remains the cheapest, most accessible and therefore most dominant delivery mechanism in both developed and developing countries.

The use of computers and the Internet is still in its infancy in developing countries, if these are used at all, due to limited infrastructure and the attendant high costs of access.

Moreover, different technologies are typically used in combination rather than as the sole delivery mechanism. For instance, the Kothmale Community Radio Internet uses both radio broadcasts and computer and Internet technologies to facilitate the sharing of information and provide educational opportunities in a rural community in Sri Lanka.

The Open University of the United Kingdom (UKOU), established in 1969 as the first educational institution in the world wholly dedicated to open and distance learning, still relies heavily on print-based materials supplemented by radio, television and, in recent years, online programming.

Similarly, the Nigerian Open University relies on print-based materials and occasionally on e-books that can be downloaded.

What is E-Learning?

Although most commonly associated with higher education and corporate training, e-learning encompasses learning at all levels, both formal and non-formal, that uses an information network—the Internet, an intranet (LAN) or extranet (WAN)—whether wholly or in part, for course delivery, interaction and/or facilitation. Others prefer the term online learning. Web-based learning is a subset of e- learning and refers to learning using an Internet browser (such as Netscape or Internet Explorer).

What is Blended Learning?

Another term that is gaining currency is blended learning. This refers to learning models that combine traditional classroom practice with e-learning solutions. For example, students in a traditional class can be assigned both print-based and online materials, have online mentoring sessions with their teacher through chat, and are subscribed to a class email list. Or a Web-based training course can be enhanced by periodic face-to-face instruction. "Blending" was prompted by the recognition that not all learning is best achieved in an electronically-mediated environment, particularly one that dispenses with a live instructor altogether. Instead, consideration must be given to the subject matter, the learning objectives and outcomes, the characteristics of the learners, and the learning context in order to arrive at the optimum mix of instructional and delivery methods.

What is Open and Distance Learning?

Open and distance learning is defined by the Commonwealth of Learning as "a way of providing learning opportunities that is characterized by the separation of teacher and learner in time or place, or both time and place; learning that is certified in some way by an institution or agency; the use of a variety of media, including print and electronic; two-way communications that allow learners and tutors to interact; the possibility of occasional face-to-face meetings; and a specialized division of labour in the production and delivery of courses."

How can ICTs Help Expand Access to Education?

ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-for- mal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus.

- **Anytime, Anywhere:** One defining feature of ICTs is their ability to transcend time and space. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. ICT-based educational delivery (e.g., educational programming broadcast over radio or television) also dispenses with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs, such as telecon- ferencing technologies, enable instruction to be received simultaneously by multiple, geo- graphically dispersed learners (i.e., synchronous learning).

- **Access to Remote Learning Resources:** Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (and available in limited quantities) for their educational needs. With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a

variety of media can now be accessed from anywhere at anytime of the day and by an unlimited number of people. This is particularly significant for many schools in developing countries, and even some in developed countries, that have limited and outdated library resources. ICTs also facilitate access to resource persons-mentors, experts, researchers, professionals, business leaders, and peers—all over the world.

When used appropriately, ICTs—especially computers and Internet technologies— enable new ways of teaching and learning rather than simply allow teachers and students to do what they have done before in a better way. These new ways of teaching and learning are underpinned by constructivist theories of learning and constitute a shift from a teacher- centered pedagogy—in its worst form characterized by memorization and rote learning—to one that is learner-centered.

- **Active Learning:** ICT-enhanced learning mobilizes tools for examination, calculation and analysis of information, thus providing a platform for student inquiry, analysis and construction of new information. Learners therefore learn as they do and, whenever appropriate, work on real-life problems in-depth, making learning less abstract and more relevant to the learner's life situation. In this way, and in contrast to memorization-based or rote learning, ICT-enhanced learning promotes increased learner engagement. ICT-enhanced learning is also "just-in-time" learning in which learners can choose what to learn when they need to learn it.

- **Collaborative Learning:** ICT-supported learning encourages interaction and cooperation among students, teachers, and experts regardless of where they are. Apart from modelling real-world interactions, ICT-supported learning provides learners the opportunity to work with people from different cultures, thereby helping to enhance learners' teaming and communicative skills as well as their global awareness. It models learning done throughout the learner's lifetime by expanding the learning space to include not just peers but also mentors and experts from different fields.

- **Creative Learning:** ICT-supported learning promotes the manipulation of existing information and the creation of real-world products rather than the regurgitation of received information.

- **Integrative Learning:** ICT-enhanced learning promotes a thematic, integrative approach to teaching and learning. This approach eliminates the artificial separation between the different disciplines and between theory and practice that characterizes the traditional classroom approach.

- **Evaluative Learning:** ICT-enhanced learning is student-directed and diagnostic. Unlike static, text- or print-based educational technologies, ICT-enhanced learning recognizes that there are many different learning pathways and many different articulations of knowledge. ICTs allow learners to explore and discover rather than merely listen and remember.

ICT AND GOVERNMENT POLICY

Before ICT can help in national development and poverty elevation, there is need to have a policy that governs ICTs and regulatory mechanism to monitor and manage operations in the ICTs sector. Some of the components to form a firm foundation for ICTs include: assessment of ICT status in all sectors of the society (e-readiness), the challenges encountered in the establishment of an e-society, and above all the will and commitment by leaders to adopt ICTs as

enablers for national economic development. There is need to have a Vision and Mission that will provide a rallying point and focus for ICT for the nation at a given period. The development of any Policy must takes into consideration what has been done in the subject area before in the country, and some national and international documents that reflect science and technology and in some instance refer directly to ICTs. These documents will form the foundation and pointers which will guide the development of an ICT Policy.

POLICY OBJECTIVES

Specific purpose and objectives of the ICT Policy should be enunciated so as to be clear about the policy and its intentions. The policy should be mindful of the need to address economic development, poverty reduction and governance among other areas.

Purpose of ICTs Policy

The purpose is to provide strategic direction and guidance for sustainable national development through the systematic application of ICTs in a country. This is achieved through the following objectives:

Policy Objectives

Ensure provision and maintenance of infrastructural facilities necessary for ICTs development, such as reliable supply of electricity, telecommunications and transport.

Promote and support the systematic, relevant and sustainable development of ICTs.

Embark on extensive educational and training programmes to provide adequate supply of qualified ICTs personnel and knowledge workers in all sectors.

Establish structures for effective implementation of ICTs strategies.

Establish institutional mechanisms and procedures for determining sectoral application priorities.

Encourage the development and use of and ensure equitable access to benefits offered by ICTs across gender, youths, the disabled and the elderly.

ICTs CHALLENGES IN DEVELOPING COUNTRIES

Developing countries are now aware of the benefits derived through adoption and use of ICTs but there are many serious challenges which must be addressed and chief among them are:

Inadequate communications and power infrastructure

Shortage of ICTs facilities and ICTs skills

Inadequate institutional arrangements

Limited financial resources

Inadequate public private partnership

Limited data management capacity

Inadequate bandwidth nationally and on the Gateway

Some of the above challenges can be addressed through public-private smart partnerships.

GOVERNMENTS PERSPECTIVES

In developing countries, governments are now faced with the challenge of transformation, a paradigm shift, necessitated by the age of network intelligence. Governments must undergo internal and external transformation in order to move in unison with the private sector and respond swiftly to ICT developments and its dictates. Internally, Governments are called to improve the efficiency and effectiveness of internal functions and processes within government departments and institutions through internetworking while externally, governments are called to be more transparent and give citizens access to government information. Government should appreciate their overall responsibility of creating a conducive environment that allows for the development of ICTs for national benefits.

E-Government which means Government uses ICTs to provide, on-line:

Convenient access to government information and services.

Delivery of public services.

Efficient and effective method of conducting business transactions must be customer driven and services oriented, meeting the needs of citizens and improving the quality of life. Ensuring the availability of minimum supply of ICT infrastructure, roads and electricity (including solar and renewable energy) for remote and rural areas should be considered an important part of those strategies. Lowering the cost of PCs for targeted population groups, relaxation of import duties, tax breaks and assurance that investors can regularly repatriate their investment should be incorporated. Government should understand ICT and their implication to government and society at large. The Policy should unequivocally spell out the role of government.

As a Policy, Government should

- Develop an e-Government policy and legal framework.

- Ensure that every ministry/department develops and manages computerised information systems.

- Ensure that every Government Ministry and Parastatal has an updated informative and interactive website.

- Create an e-Government Agency to coordinate and rationalise efforts by government entities working on ICTs.

- Make e-Government services accessible to all citizens.

- Provide a systems security framework for e-Government.

- Build capacity for e-Government.

E-GOVERNANCE

E-Governance includes the use of ICTs in the following areas:

Participation in the decision making processes by the citizens, e.g. formulation and implementation of economic and social policies,

Making Government more accountable, transparent and effective,

Facilitating the electoral processes, and Maintenance of law and order.

The following should be reflected at policy level

- Promote the principle of Universal Access.

- Develop on-line projects that provide information on governance at and across all levels of society.

- Strengthen governance and legal framework that promotes participatory democracy and accountability.

USEFUL COMPARISONS

There is need for countries to benchmark their ICT programmes and pay particular attention to the progress made by other developing countries. India and Malaysia are good examples to study. Several States in India, for instance Kerala State, have embraced e-Government principles and models and have gone down to village levels where villagers through Information Centres have access to communication facilities, information on land, training, payment of bills, local data sources, etc.

CONCLUSIONS

ICTs are enablers for economic growth because of their crosscutting nature thus affecting all sectors. Adoption and proper utilisation of ICTs will lead, among others, to increased yields and quality production of goods and services. ICT industry can be resourced, properly managed and mainstreamed into a significant contributor to GDP.

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