

Survey of Information Communication Technologies (ICTs) Capacity Needs of Knowledge Based Economy

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Abstract

This paper is on a survey of information communication technologies (ICTs) capacity needs of a knowledge driven economy. To achieve a sustainable social and economic wellbeing of the people in Africa, there is the need to be futuristic in investment and development of required communication competencies that will sustain African global relevance in the knowledge economy. Presently, Africa is still very disadvantaged in the ICTs competencies for the knowledge economy. The paper used the qualitative research approach to establish the context of capacity needs, particularly the ICT competencies expected to sustain global application in a knowledge economy. Findings from the secondary sources consulted in this study showed among other things that, there is a growing drive for ICTs competencies. Capacity needs include but are not limited to networking skills, communication skills, learning ability, problem solving, team work, network transaction skills and capacity for self-management. The paper concludes that ICTs capacity needs are related to the general competencies demanded in knowledge based economy. It recommends that knowledge of ICT must be leveraged on specific competencies for effective adaptation to the sustenance of social and economic wellbeing of the Africans.

Keywords: *Capacity needs competencies, Economy, Information communication technology, knowledge.*

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Background to the Study

There is a global paradigm shift in the development landscape since the dawn of the twenty-first century. This shift is strictly engineered by information communication technologies (ICTs) as manifest in education, agriculture, commerce, trade and investment, science and technology, information, management, transport, communication among other areas of significant predictors of social and economic wellbeing of a people. Fundamentally, the premise of this shift is the global quest to grow knowledge driven socio-economic systems that are less complex, fluid, flexible, fast and efficient in the satisfaction of the needs of humanity. As such, development interest now focuses on building capacity of citizens and identifying knowledge competencies that are needed and basic to sustain the demand and supply chain of knowledge based economy in Africa.

In today's public and private sector organizations, Oghenekohwo and Adeleye (2016) found out that, both internal and external forces of market competition, consumer behaviour, technology and quality management are the drivers of organizational change. Besides, it was noted that in a corporate world of work, every segment requires facts and accurate information for quick decision-making (Akpomi & Ordu, 2009), and problem solution which often times are facilitated by capacity in ICT skills and knowledge (Oghenekohwo et al,2016)

Information and communication technologies (ICTs) in the submission of United Nations Education, Scientific and Cultural Organization (UNESCO, 2008) refer to computer based tools used by people to work with the information and communication processing needs of an organization. This encompasses the computer software and hardware, the network and several other devices (video, audio, photograph, camera, among others) that convert information (text); images, sound, motion and so on into common digital form. These elements are critical and require the development of capacity to meet the application needs of actors in the knowledge economy. This is because, knowledge economy is based on the production and use of information and the knowledge is driven partly by possibilities opened up through technological change (Organization for Economic Cooperation and Development, OECD, 1996; 2011).

It may be recalled that among other lesser developed global systems, Africa is faced with the pressure posed by the impact of a global knowledge economy and space. To respond to this pressure, Africa must develop its production and consumption capacities to the extent that, the application of ICTs tools is adaptive and sustainable. This becomes inevitable because, efforts are currently underway at the Organization for Economic Cooperation and Development (OECD) to learn more about the effects of ICTs and other factors on recent growth patterns. OECD's (2000a) findings point towards technology and innovation as important drivers of recent economic growth performance. Knowledge economy is a system of consumption and production that is based on intellectual capital. In this sense, intellectual capital (or human capital) depicts competencies which are a key component of value in a knowledge-based system that require regular update and upgrading. However, such competencies need to be identified especially as they situate in ICTs(OECD,2001; Adeyemi,2011).

Concerns of the Study

Most African countries according to OECD (2000b) are still agriculture or agriculture and manufacturing-based economies, while developing countries tend to have manufacturing or manufacturing and service-based economies, and developed countries tend to have service based economies. Knowledge-based industries, which include the main producers of high-technology goods, high and medium technology manufacturing and the main users of technology (namely knowledge-intensive services such as finance, insurance, business, communication and community, social and personal services) account for more than half of OECD GDP and continue to grow rapidly.

The difference between developed and less developed national systems with reference to knowledge economy is the lack of intellectual capacity on the part of less developed countries ICTs and innovations to sustain social, economic and political wellbeing of the people. Meanwhile, one is also concerned that, the United Nations Commission on Science and Technology for Development (UNCSTD, 1997) concluded that for developing countries to successfully integrate ICTs and sustainable development in order to participate in the knowledge economy they need to intervene collectively and strategically. In this sense, the concern is on the ICTs capacity needs of a knowledge-based economy. What are these ICTs capacity needs of a knowledge economy? Can these capacities enhance ICTs competencies in a knowledge economy?

Objectives of the Study

Generally, the study sets to achieve the following objectives;

- (a) Establish icts capacity needs of knowledge economy;
- (b) Find out associated between icts capacity needs and competencies for knowledge economy; and
- (c) Establish the impact of icts capacity on knowledge based society.

Methodology

This study relied on secondary data collected from national and international research reports, documentaries, and empirical studies. The data collected were reviewed qualitatively to establish the objectives stated for the study.

Findings

The findings of the study are presented under specific themes as follows:

Information Communication Technologies (ICTs) Capacity Needs

There are many characteristics of ICTs with each concerned with the effective and efficient provision of information to recipients. The provision and use of such information are geared toward an end. It must therefore be driven by purpose, accuracy and relevance (Adeyemi, 2011). ICTs generally are tools that stress the role of unified communications, integration of telecoms such as telephone lines and wireless signals coupled with necessary software, storage, audio-visual and other systems, which enable users to create, access, store, transmit and manipulate (organize) information (Yusuf, 2005). These features are evidently associated with knowledge-intensive services such as finance, insurance, transaction, communication, trade, banking, education, science and technology among others.

Some analysts observed that basic reading, writing and arithmetic skills are no longer enough for workplace performance, yet they constitute the starting points (Camevale, Gainer and Meltzer, 1990). Further investigation stress the fact that there are new or changing competencies which are highly valued in the labour market which are also consistent with the demand for service based economy.

In hiring decisions, evidence from the United States, on a qualitative survey on firm's recruitment strategies for entry-level job show that not only mathematical and English skills were required for today's entry-level jobs, but intra-personal skills were also quite important. The survey showed that among the hiring criteria for potential employees, intra-personal and communication skills were the highest ranked (Rosenbaum and Binder, 1997) In the United Kingdom, employers reported that communication skills, learning ability, problem-solving skills, team work and capacity for self-management were more important than technical, ICTs or numeracy skills as criteria in the recruitment of graduates (Hesketh, 2000). In the submission of Lavore and Roy (1998) the main characteristics of a knowledge-based economy is the increasing need to rely on highly skilled workers whose skills are not exclusively related to science and technology but also, the control, management and coordination of tasks. In other words, the capacity needs of workers knowledge economy workers would be those that focus on five domains, namely, knowledge, management, data, services and goods (Osberg, Wolfe and Baumol, 1989)

Analyses carried out on firm-level practice according to Bresnahan and Bryjolfsson (1999) OECD, 1999a) show that, there is a strong correlation between information technology, human capital and workplace organization. Other studies have established links between the introduction of ICTs and the demand for skills or skills upgrading (Baldwin, Gray and Johnson, 1997; Berman, Bound and Machin, 1997; Machin, Ryan and Van-Reena, 1996). All these studies established evidences of capital-skill complementarities and strong positive correlations between the level of computer investment in an organization and changes in the skill composition of the workplace in a knowledge-based economy.

In the eleventh Malaysia plan (2016-2020) on ICT (Strategy Paper 15 nd) it was documented that Malaysia's vision of being an advanced economy and exclusive nation will be built among others, upon a knowledgeable and skilled society supported by a robust, vibrant and sustainable ICTs industries. This underscores a determination to sustain a knowledge economy with such transformation hinge on mindset and behaviour change of businesses, citizens and the public service towards a data driven culture. According to the plan, efforts are on to strengthen the drive for ICTs in the knowledge economy through four main strategies, namely: re-energizing ICTs industry, ensuring supply of high quality ICTs human capital, improving digital infrastructure and pursuing digital inclusion. These four strategic areas do not only constitute the basis of the relationship between ICTs and knowledge economy, but also, highlight the main areas of capacity needs for sustained social and economic wellbeing of Nigerians in the context of a knowledge society.

In a more specific term; to re-energize ICTs industry demands huge investment capacity which must be strategic and policy driven. Secondly, ensuring supply of high quality ICTs human capital requires both formal and informal education at the tertiary level. Such training is expected to provide university graduates with capacity to apply high quality ICTs knowledge to problem solving, decision-making, team management, and organizational communication. Thirdly, improving digital infrastructure and pursuance of digital inclusion demand investment capacity in and for a knowledge economy. Therefore, ICTs capacity needs of a knowledge economy must focus on the above areas for the achievement of sustained social and economic wellbeing of Africa in the knowledge society.

Information Communication Technologies (ICTs) and Competencies for Knowledge Economy

The needs for ICTs leveraged competencies in knowledge economy stem from the challenges faced by Africa in terms of integrating ICTs with sustainable development. The collective intervention and strategic models (UNCSTD, 1997) which are needed in relation to the development of competencies are the options opened to Africa in the drive for ICTs mediated knowledge economy. Recall that the pressure to increase the role of information and knowledge in national economies has provoked a wide-range discourse about what kinds of competencies Nigerians need to situate in the knowledge economy. Knowledge workers can be classified as those performing knowledge-rich jobs which are facilitated by ICT competencies. Some knowledge workers have high levels of literacy (including ICT) and lower levels of education, implying that basic skills obtained beyond education are recognized in the knowledge economy (OECD, 2000).

Also, OECD (2000) reported that there are additional “workplace competencies” needed in the knowledge economy.. Hence, the concepts of “knowledge economy” and “knowledge worker” are based on the view that information and knowledge are at the centre of economic growth and development. Besides, reports show that, the ability to produce and use information effectively is a vital source of skills for many individuals (OECD, 2000). Thus it is accepted based on research findings that the emergence of the knowledge economy is partly attributed to globalization and technological advances, which of course is engineered by ICTs, and so, demand for higher levels of competencies.

Empirically, the growth of knowledge-based industries is taking place at a time of increased investment in ICTs and advances in the use of the internet super highway. Investment in information technology (IT) hardware, software, and telecommunications services accounted for almost 7% of OECD GDP about twenty years ago (1997), with the highest shares in Sweden, the United States, the United Kingdom, Switzerland, Australia, New Zealand and Canada. This rate has increased astronomically over the last five years. Investment in IT has grown over the years to the extent that, these economies are best described as information driven knowledge society (OECD, 2001; OECD & Statistics Canada, 2000).

In a review of reports on different types of workplace competencies that are mostly agreed upon by different analysts, Stasz (2000) provided a summary of such competencies under the following sub-headings which are essential in the definition of ICTs policies and road map for knowledge economy.

- (i) **Inter-Personal Skills:** Team work and the ability to collaborate in pursuit of a common objective and leadership capabilities
- (ii) **Intra-Personal Skills:** Inclusive are :motivation and attitude, ability to learn, problem-solving skills, effective communication with colleagues and client, and analytical skills capacity
- (iii) **Technological or ICT Skills:** Inclusive are: software, hardware and service ICTs resources management, ICTs equipment, maintenance and storages

Challenges of ICT Capacity Needs in Knowledge Economy

Most African countries are yet to come to terms with the demands of knowledge based economy. The reasons according to Kundishora (2005) are evident.

- (i) Most African countries purportedly have ICT policy objectives, yet, there is lack of institutional capacities, to drive e-governance, and governments are not accountable, transparent and effective. Besides, there is low participation in the decision making processes by the citizens, especially in electoral processes, maintenance of law and order.
- (ii) Inadequate communications and power infrastructure.
- (iii) Inadequate public-private partnership due to poor ease of business environment.
- (iv) Limited data management capacity
- (v) Limited financial resources
- (vi) Poor institutional arrangement to support investment in ICT.
- (vii) Shortage of ICTs facilities and ICTs skills
- (viii) Inadequate band with rationally and on the gateway.

These challenges have compounded transformation among African states, and in order to situate the knowledge society, there is a paradigm shift, necessitated by the age of ICTs intelligence. Until these challenges are addressed with a concerted approach, it is very doubtful if ICT competencies can be attained by expected knowledge workers to drive a globally influenced knowledge economy.

Conclusion and Recommendations

Developed economies are increasingly built on the ICTs competencies of workers and citizens. ICTs transform the way knowledge workers think and learn as they create, support risk-taking and knowledge sharing (Akwegwu, Nwiue & Agba, 2008). As evident from studies (Oghenekohwo and Adeleye, 2016) the economic importance of ICTs in knowledge society is key driving force for growth and employment. Therefore, to sustain the social and economic wellbeing of Africans in a globally entrenched knowledge economy, it is affirmed that the reality of the knowledge driven economy is not just a description of high tech initiatives, it describes a set of new services of competitive and comparative advantages which can apply to all sectors, from agriculture and retailing to

software and biotechnology made possible by the acquisition and application of competencies for the knowledge economy.

Consequently, attention must be on the following areas in sustaining ICTs capacity needs in a knowledge economy that is fast growing into a global network economy.

1. Government must appreciate overall responsibility of creating a conducive environment that allows for the development and deployment of ICTs for national benefits.
2. e-Governance as measured by convenient access to governing information and services, delivery of public services efficient and effective method of conducting business transactions are central to a knowledge economy.
3. Workplace competencies, such as team-work, communication skills, and problem-solving skills are associated with new organizational practices and knowledge workers. These must not be seen as substitutes for education and literacy skills, but rather as complementary to both ICTs and knowledge competencies for the knowledge economy needed for sustained social and economic wellbeing of Africa.

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