

Information and Communication Technology as a Tool for Economic Development

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Abstract

Nigeria has continually sought effective strategies to enhance the performance, efficiency, and productivity of various sectors of its economy in pursuit of national development. This paper discusses the concept of development and Information and Communication Technology (ICT), highlighting its positive influence on critical areas such as healthcare, governance, employment generation, business operations, education, economic growth, national security, and overall productivity. It emphasizes that ICT serves as a vital tool for fostering national development, though certain challenges must be addressed for maximum impact. The study adopts the Social Change Theory as its scientific foundation. Additionally, the Technological Determinism Theory posits that media technology influences how individuals and societies think, feel, act, and function as they transition across technological eras. Technology is therefore viewed as a driving force of social transformation, shaping new forms of living and promoting excellence. The paper concludes that ICT represents a major pathway for reforming Nigeria's politics, governance, security, business, education, and employment systems from inefficiency to effectiveness. Among its recommendations is the establishment of an institutional framework to ensure ICT integration across all sectors of the Nigerian economy.

Keywords: Development, Information and Communication Technology (ICT), Politics, Education, Employment Opportunities.

Introduction

The development of technology, especially Information and Communication Technology (hereinafter: ICT), has had significant effects on the economy and other aspects of human life in recent decades. It is impossible to imagine the effective functioning of an individual, an economy, and a whole society without the use of ICT. These effects are especially noticeable in the period of dramatic changes associated with the COVID-19 pandemic, when ICT allowed the "new normal" (Minska-Struzik and Jankowska 2021; Huateng et al. 2021) to function. Educational institutions, the health system, enterprises, households, and the entire world economy depend on ICT. In the 1980s, in endogenous growth theories, scientists claimed that technological changes were the foundation of economic growth and stressed the importance of investing in human capital (Romer, 2006; Lucas, 2008; Grossman and Helpman, 2011). In addition, according to the human development theory, income is only one of the elements that lead to the fulfilment of human needs; ICT is considered to have significant effects on the fulfilment of human needs, even greater than monetary income, because it improves the overall quality of life. ICT provides individuals with access to information, enables social interaction, facilitates access to education and healthcare, and creates new business opportunities. Thus, ICTs can have both direct and indirect effects on the quality of human life. Furthermore, according to the European Parliament (2001) study, ICT offers remarkable opportunities to adequately address poverty in developing countries. ICT can assist the poor in business development or promote self-determination. From an equality perspective, ICT can also facilitate access to education and health, ensuring inclusion. Sen (2010) claims that information technology is responsible for the expansion of human freedoms and that it leads to better efficiency in various human activities. ICT is expected to have an even greater impact in the

future. This impact is widely seen as positive, especially at the macro level as mentioned above, but at the micro level there are also possible negative consequences. From a psychological point of view, ICT also causes stress and anxiety, leading to modern diseases in developed countries. Developed countries are also expected to reach a steady state with respect to ICT, while developing countries are not; thus, ICT may have a greater impact in these countries. Therefore, ICT is an important topic in academic literature and public discourse. This paper confirms previous findings of the importance of ICT in economic development in developing countries. This paper highlights the important role of ICT in sectors of the economies of developing countries and present ICT as one of the factors of economic development. On the other hand, the study shows that ICT use is not significant in developed countries and would be required to help lift developing countries into growth and integration into the global world. Hence, ICT development in developing countries can serve as a tool for human and economic development, policies and actions. Developing countries could integrate more easily into the current economic environment if they made the most of the opportunities offered by new technologies. The people living in these countries could also have easy access to new knowledge and information, health, job opportunities, etc. Hence, the thrust of this study.

Literature Review

Concept of Development

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The concept of *development* has been interpreted from different scholarly perspectives, largely due to ongoing debates about its true meaning (Ekpe & Okereke, 2010). Some scholars use the terms *growth* and *change* interchangeably with *development*, but these concepts are not synonymous. While economic growth can be a component of development, it does not constitute development on its own.

From one perspective, development is understood primarily in economic terms, specifically as the maximization of Gross National Product (GNP) or Gross Domestic Product (GDP) through capital accumulation and industrialization (Merer, 1989). Under this view, economic indicators serve as key measures of progress.

In contrast, the Marxist or Radical school of thought defines development more broadly, emphasizing improvements in human welfare and living conditions rather than mere economic statistics. According to this perspective, the essence of development lies in enhancing the quality of life for the majority of people ensuring access to education, healthcare, employment, and essential infrastructure (Ekpe & Okereke, 2010). Development, therefore, involves creating conditions that promote the well-being of citizens across all regions of a country (Onyeka, 2016). When these conditions are met, national development can be said to have been achieved.

Concept of Information and Communication Technology (ICT)

Information and Communication Technology (ICT) encompasses a wide range of tools and applications, including both hardware and software components such as computers, mobile devices, communication systems, internet platforms, and data-processing tools (ED UNDF, 2021).

ICT covers diverse digital media like Facebook, Instagram, Twitter, WhatsApp, Zoom, YouTube, and other internet-based platforms that facilitate effective global communication and transactions.

In recent years, ICT has significantly boosted productivity across vital sectors of the global economy and has positively affected the lives of individuals who depend on technology for their daily activities. It has also played an essential role in promoting democracy, strengthening business operations, and transforming education systems.

This paper critically examines the role of ICT in Nigeria's development, particularly its impact on key sectors such as governance, business, health, education, employment, and national security, with the aim of evaluating its contribution to overall national growth.

Theoretical Framework

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Technological Determinism Theory

The concept of **Technological Determinism** is attributed to Canadian scholar **Marshall McLuhan (1962)**, a prominent communication theorist, philosopher, and educator. The theory suggests that technological tools especially media technologies shape how individuals and societies think, communicate, and behave. In essence, people's actions and interactions are largely influenced by the dominant communication medium of their time.

According to McLuhan, human free will is limited in this regard; society adapts to the communication technologies available to it. As new media emerge, modes of social interaction evolve accordingly. For example, the telephone promotes verbal communication over distance, while electronic mail (email) enables written exchanges through computers. When the medium is impersonal, such as television, the messages it conveys also tend to be impersonal.

Technological determinism maintains that everyone using the same medium is likely to experience similar effects from it because the medium itself shapes perception and behavior. This viewpoint is objective rather than value-based it relies on observable evidence of how media influence human interaction.

McLuhan famously stated that "*the medium is the message.*" This means that each form of technology engages specific human senses and alters how people perceive and respond to the world. For instance, the radio primarily stimulates the auditory sense, while television combines auditory and visual stimulation, changing how audiences receive and process information. Over time, society internalizes these changes, reflecting them in everyday life.

Thus, the theory argues that technological innovation drives social transformation. Each new communication technology reshapes human consciousness and societal structures, leading to the creation of new lifestyles and social norms. In this sense, technology is a key agent of social change and a central factor in the evolution of human civilization.

Impact Areas of ICT on the Nigerian Economy

Like many other nations, **Nigeria** recognizes the growing importance of Information and Communication Technology (ICT) in meeting the rising demands of work, production, and service delivery across various sectors. ICT tools such as computers, multimedia devices, assistive technologies for people with disabilities, and other digital equipment have become essential to national productivity (Obiozor, 2011). The following areas illustrate ICT's influence on Nigeria's economic development:

i. ICT in Health (E-Health and M-Health)

ICT plays a transformative role in healthcare by enabling the monitoring of disease outbreaks, disseminating health information, and facilitating remote medical training and support. **E-Health** refers to the application of ICT in healthcare delivery covering clinical, research, administrative, and educational functions irrespective of location (Abolade & Durosinmi, 2018).

Similarly, **M-Health (Mobile Health)** enhances existing health systems through the use of mobile devices such as smartphones and PDAs to improve efficiency, accuracy, and communication among healthcare providers. These innovations have improved disease management, data reporting, and access to healthcare in both urban and rural areas.

ii. ICT in Governance (E-Governance and Politics)

ICT has revolutionized governance in Nigeria by increasing transparency, accountability, and access to public information. Many government agencies now maintain websites where citizens can access data on policies, job vacancies, contracts, and programs. This digital accessibility has strengthened public engagement and improved productivity within the civil service (Isizoh et al., 2013).

In the political sphere, ICT is pivotal to **election administration**. Since elections are the cornerstone of democracy, ICT tools such as **biometric registration**, **smart card readers**, and **electronic collation platforms (e-CSP)** have been introduced by the Independent National Electoral Commission (INEC) to ensure credible and transparent electoral processes (Ayeni, 2018; Piccolino, 2015).

These technologies have reduced issues like double registration, multiple voting, and result manipulation enhancing electoral credibility. A major example was the **2015 general election**, where technological improvements contributed to a peaceful transfer of power between political parties.

ICT has also transformed political campaigns, with many politicians now using social media platforms to reach voters. With proper legislation, ICT could further support innovations such as **online voting**, ensuring inclusivity during situations like pandemics or emergencies.

Key benefits of ICT in governance include:

1. Reducing double registration.
2. Preventing multiple voting.

3. Limiting result manipulation.
4. Enhancing transparency and efficiency in electoral activities.

iii. ICT and Employment Opportunities

ICT has opened new employment pathways, especially for young people and migrant workers. Through digital literacy, vocational training, and entrepreneurship programs, youths are now able to develop marketable skills in fields such as software development, bioengineering, digital media, and mobile app creation (Abolade & Durosinmi, 2019).

By fostering innovation and self-employment, ICT encourages youth creativity and enterprise. Social media platforms and online networks also serve as incubators for business ideas, enabling young Nigerians to access markets and customers beyond geographical boundaries.

iv. E-Business and Digital Services

Online business operations, or **e-business**, have rapidly expanded in Nigeria, driven by an educated, tech-savvy population and increased internet penetration. The emergence of **e-commerce** models such as **Business-to-Business (B2B)**, **Business-to-Consumer (B2C)**, and **Consumer-to-Consumer (C2C)** has allowed small and medium-sized enterprises (SMEs) to reach wider audiences (Abolade & Durosinmi, 2018).

Similarly, public services are increasingly adopting **Government-to-Government (G2G)**, **Government-to-Citizen (G2C)**, and **Government-to-Business (G2B)** models to improve service delivery and inter-agency coordination (Piccolino, 2015). These innovations enhance efficiency, reduce bureaucracy, and strengthen transparency in government operations.

v. ICT in Education (E-Learning)

ICT serves as a powerful tool for expanding educational access and quality. **E-learning** platforms extend education to populations traditionally excluded due to geography, cost, or social barriers such as rural communities, women, persons with disabilities, and the elderly (Uyanah, Uweh & Okon, 2021).

Education remains a critical driver of national development by building human capital and improving productivity. ICT-based learning enhances access to remote resources, promotes interactive and creative learning, and encourages collaboration among students and teachers.

The major advantages of ICT in education include:

- Access to remote and digital learning resources.
- Active, creative, and collaborative learning opportunities.
- Improved assessment and feedback systems.
- Inclusive learning for marginalized populations.

vi. ICT and Economic Development

Economic growth is closely linked to a nation's ability to increase productivity, and ICT is a vital enabler of such growth. By enabling more efficient use of resources, ICT helps to create higher-value outputs with fewer inputs.

ICT also promotes wealth generation through innovation, information sharing, and knowledge accumulation. Although technology alone cannot resolve every developmental challenge, when integrated with human and institutional resources, it can significantly transform industrial organization, trade, and daily life (Uyanah, Uweh & Okon, 2021).

vii. ICT and National Security

ICT has become a key tool in addressing security challenges such as crime and terrorism. For instance, the **Bayelsa State Government** under Governor Seriake Dickson partnered with **Huawei Technologies** to install a comprehensive **CCTV surveillance system** in Yenagoa, which improved crime monitoring and prevention (Isizoh et al., 2013).

Similarly, Lagos State under Governor Akinwunmi Ambode deployed surveillance cameras in major areas to enhance public safety. Other technologies such as **car trackers, remote sensors, and GPS systems** have been used to track vehicles, monitor logistics, and prevent terrorist activities. These applications highlight ICT's contribution to both economic stability and national security.

viii. ICT and Productivity

ICT contributes to higher productivity by introducing innovative production methods and improving coordination across organizations. Its adoption allows businesses to streamline operations, reduce costs, and respond more quickly to market changes.

The use of ICT in economic activities often generates both **direct and indirect** effects. Directly, it creates new jobs and industries; indirectly, it boosts productivity by optimizing the use of labor and resources. Coordination improvements enabled by digital communication and e-commerce reduce inefficiencies and stimulate economic growth (Isizoh et al., 2013).

Overall, ICT enhances productivity not merely through new technologies, but by reshaping organizational structures, workflows, and market dynamics.

Would you like me to continue with the **Methodology, Conclusion, and Recommendations** sections next (these can be paraphrased together concisely)?

Methodology The study utilized the library research technique to gather data for the work. Most of the information sources were drawn from previous literature. Thus, secondary sources were used to gather data. The data were gathered from journals, periodicals, textbooks and online materials. In addition, critical observations by the researchers were also utilized to analyze events relating to the phenomenon.

Conclusion In order for Nigeria to be economically competitive, politically stable, and socially secured, there is need to utilize ICT in making advances in health, politics, education, business, agriculture, national security and poverty reduction. The country needs to focus its attention on the positive development, access and implementation of ICT both in the rural areas where majority of the poor people reside and in the urban areas. With ICT becoming the third largest contributor to

Nigeria's GDP as well as the largest provider of employment second only to government coupled with general improvements in the living standards of the people, Nigeria's socio-economic development can indeed be improved.

Recommendations It is therefore recommended that, if Nigeria is to achieve her Vision 20:2020 set objectives, as a matter of necessity she must invest massively in Information and Communication Technology (ICT) Sector so as to compete with other great countries in the world.

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