



Utilizing ICT in Sustaining National Development Using Digital Economy and IOT

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Abstract: The pervasive utilization of information Technology devices is in crescendo and taking dynamic shift as the day goes by. This started from using computer system for storing of data, communication and transfer of data and now to the use of computer for online marketing and transaction and remote monitoring of device. With computer and mobile devices now people and sell and promote their services at ease on just a click over the internet. And in recent times the availability of strong wired and wireless network connectivity has led to the idea of internet of things. This idea makes possible for human to machine interaction and machine to machine interaction. This development has promised better and easy life even though with some consequences. It provides smart education allowing student learn from anywhere at any time, smart city, smart homes and e-health. This research focuses on exploring the diverse opportunity provided by the IOT and Digital economy for national development. Considering the present outright and outbreak of Covid-19 pandemic, the effective utilization of these techniques can lead to a boost in economy and un- interruptive and smooth running of government, industries educational institution in the face of natural disaster, compared to the gross damaged in economy, industry and educational institution caused by the Covid-19 pandemic.

Keywords: Information and Communication Technology (ICT), Digital Economy, and Internet of Things (IOT)

1. Introduction

The advent of information and communication technology (ICT) has drastically changed the human ecosystem from the traditional and analog way of dealing and handling things to the world of digital devices [1]. This rapid shift has influenced human society thereby making so many countries, organizations and institutions to embrace ICT in order not to fall off the digital evolution [1, 2]. Information and communication technology devices such as Radio, Television, Computer system has made life easier for human through accessing and disseminating of vital information, providing educational programs for kids and faster processing of data into information [1]. The appearance of internet and broadband network has added more value to the utilization of ICT devices by allowing the digital devices to communicate with each other instantly in order to exchange data and information with one another. This has significantly improved the public and private sectors by wielding the way they conduct and carry on their operation [4]. The introduction of

smartphones has made life beneficial for organizations, individuals, institutions and government at large. Through the evolution of the internet the smartphones has become a tool for accessing, utilization and distribution of vital information on the go. Moreover, the internet has led to the introduction of software which facilitated human interaction and conveying of information such as email, video conferencing, live streaming numerous order web services and applications. These software applications are utilizing the computer system and mobile smart phones to accomplish complex and easy tax making them a good tool for both economic and social development in reduction of cost and improving availability of goods and services [5].

Interestingly, ICT tools are bringing about innovations in industry, organizations, individual and government policy at large. Digital marketing and digital economy is the likes of the innovation achieved through the use of ICT and internet in promoting economic growth by providing online business opportunity and promote the sales of goods and services of an organization and individual at large aiding job creation and

employment opportunity [6]. Most recently, the idea of Internet of things which has aroused a divergent promising opportunity and impact in the industry known as the industrial internet of things, society, such as smart learning, smart homes, smart city etc. has become a new trend in accelerating production, business, and learning with effective utilization of ICT gadgets.

With all that is mentioned, ICT has continued to attract diverse opportunity in business, industrialization, education by widening the market opportunity for business owners, remote access and control of machines in an industry and easy access of a forehand information and research avenue to individuals and academicians [7, 8]. All these are major factors in improving and sustaining national growth and empowerment. With the proper implementation of ICT facilities and policies it is possible to stimulate the national economy and to provide opportunity for national development. Even though, ICT device and infrastructure has some underlying challenges which are both human and devices, yet it provides innumerable small and large windows of opportunity which cannot be overemphasized.

The increased diffusion of ICT facilities and infrastructure has led to immersed research opportunity in order to explore its importance in ensuring national growth and development. However, this work is aimed to highlight the significance of ICT in impacting the sustainability of national development using digital economy and IOT.

2. Harnessing ICT and Digital Economy for National Development

The idea of Information and Communication Technology is a fueling factor in the 21st century in bringing about innovation and development in the traditional mode of doing business and exchange of goods and services by adopting the concept of internet to achieve huge success at remote location. This gradual move towards advanced technology has given birth to a most interesting idea of digital technology and digital economy that has become widely adopted trend in many countries today. Digital Economy is an innovative economy whose idea is based on harnessing and utilizing information technology platforms such as hardware and software applications to carry out its internal and external operations and all its economic activities [9]. It is a global society of information technology centered on the effective utilization of information technology gadgets such as smartphones, internet and other electronics medium to produce, consume and exchange goods and services in the global central markets. Digital economy also focuses on the professional market knowledge, creativity and innovative driven society. One of the amazing innovations of digital marketing is Bitcoin which provides a disruptive idea of open internet banking with digital currencies on bases of peer-to-peer agreement. This idea redefines the financial sectors by eliminating middle man and creates a community the system to manage the activities and succeed within the system. For digital economy to

succeed in sustaining national development it needs to gain the confidence and trust of the stakeholders which is a baseline for promoting the ideas and participating in the services it offers [7]. This innovation of digital economy has provided an opportunity for un-captured GDP by harnessing the untapped soft computing resources. It provides happiness to people and utility which is not captured in the GDP record. The utilization of soft innovation resources assist in removing all barriers and conflict of GDP growth between employers, labour union, and gender discrimination thereby overcoming economic stagnation [10].

3. Utilizing IOT for National Development

The name internet of things IOT was first coined by Kevin Ashton in 1999 [11]. Since then, the idea has been gaining ground through the utilization of modern pervasive computing. IOT is the interconnection of smart devices such as phones, wearable electronics, domestic and industrial appliance to exchange information over the internet. These smart devices make use of Radio Frequency Identification (RFID), Near Field Communication (NFC), and Low power Bluetooth Wireless Sensor Network (WSN) to sense, detect, identify and communicate with each other to share data [12]. Each of the objects and things involved in IOT has a unique address which makes possible for the smart devices to access and communicate to each other in order to achieve a common goal. Then IOT as mentioned solely depends on internet to uniquely and continuously relay information between objects or things based on a set of standard communication protocols. With the continuous increase in the world population and massive connection of devices to the internet, the idea of IOT has been used to make life better, business to thrive, provide easy education, availability better health services, boost agriculture and smart transportation to mitigate loss of life due to accident. These are achievable through the possibility of smart homes, smart city, smart transportation, e-health and smart agriculture [13]. IOT is categorized into three: Industrial internet of things, society internet of things and environmental internet of things. The industrial internet of things deals with smart industry where machines communicate and maintain production lines without human intervention and other commercial and financial transactions between organization and business enterprise [14]. The environmental internet of things deals with maintenance and sustainability of natural resource and safety. This involves the sustainability of robust agriculture through soil analysis and weather monitoring in order to obtain a huge yield of crops. It also involves weather analysis and prediction of quakes, land slide and other natural disaster in order to guide the people in the environment and prevent them from being victims of such. The society internet of things domain is made of smart cities where all locations and towns within a city are connected, smart homes that connect all home appliances in order to guard against waste of energy etc. e-health which involves telemedicine and

diagnosis of patient without human intervention and smart transportation that provide sensors that detect and prevent cars from running into each other and gives information routing in order to decide on the best route to take in order to arrive at a particular location without interruption [15]. Considering the diverse benefit of IOT, the recent insecurity challenges bedeviling the world can curtail by inventing monitoring drones that can detect and expose the hideout of terrorist. And also inform security operatives about planned attack by terrorist for security operatives to intervene and avert such attacks. Moreover, the surveillance drone can also expose criminal activities such as armed robbery within cities and towns if the cities are connected and make security operative to trail on the criminal activities.

With the recent outbreak of the Covid-19 pandemic that has kept of 1.6 billion students at home shut down activities and compel both private and government institution to stay and work at home, the idea of IOT can be harnessed eased the burden and damage caused by the pandemic. Especially, in the area of medicine where the pandemic is ravaging and consuming both the life of the medical personals and the covid-19 victims alike, e-health can be used to administer telemedicine and diagnosis on the covid-19 victims without direct contact that could risk the life and health of the medical practitioners. Additional, implementation of surveillance drone can ease contact tracing of Covid-19 victims by elimination house to house test and providing information and address of suspected and confirmed cases of the Covid-19 victims. This development can also lead to identification and exposure of gathering and individuals who do not comply with world health organization guidelines on social distancing, the use of nose mask and application of hand sanitizer [16].

The unprecedented shutdown of schools, business and industry by Covid-19 caused by the spread of covid-19 pandemic can properly mitigated using IOT. This would be achievable by adopting industrial internet of things to ensure the smooth running of industries even in the face of the pandemic. Study at home method can be adopted by massively developing and deploying virtual reality gadget and making them accessible for learning to students at home [17].

4. Conclusion

The progressive advancement in world of information technology cannot be over emphasized due to continued innovation and development of diverse and dynamic ideas that are creative and meaningful to the world. Especially, the concept of digital economy has been used to provide job opportunities and generates non GDP revenue. This idea is huge because it provides and avenue to promote, market and sell product online using internet connectivity on just a click. Also, IOT is a new paradigm that harnessed pervasive computing to create the ability of human to machine interaction, machine to machine interaction etc. Both technologies have been explored by many advanced country today and it has yielded a huge success. Considering the huge success realized in other part of the world by experiencing the

benefit of IOT and digital economy, the idea can be adopted by other countries in the world for national development especially in Nigeria. The recent moved by National Information Technology Development Agency (NITDA) and Ministry of Communication and Digital economy in providing advocacy for youth to embrace the idea of digital economy, can go a long way by creating job opportunity, business opportunity thereby reducing the unemployment index rate in the country. Moreover, IOT can be used to better the educational system by providing robust devices to deliver and teach student anywhere and anytime. Must specially, in the face of natural disaster like the appearance of Covid-19 which has shutdown educational institutions, government parastatal, industry and private organization at large, the present of internet of things, the work at home method can be better improved with less negative impact felt.

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