

## Internet of Things (IoT) in Economic Growth

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### **Abstract**

*One of the greatest tools and drivers for economic growth and development is Information and Communication Technology (ICT). Its applications are limitless and one of its applications is the Internet of Things (IoT). The Internet of Things (IoT) is applicable in various aspects of our lives, and these include; social, economic and business, work, entertainment, manufacturing, home and offices, environment etc. The integration of IoT as an ICT tool for economic growth in the contemporary society has become a necessity and a given factor. This is as a result of its ability to bring about the smart society, smart environment, smart office, smart home and even the smart economy. This paper therefore, looks at Internet of Things (IoT) and its effects on economic growth. It also made several recommendations such as the need for business leaders and policy makers to create an enabling environment in order to aid IoT to realise its full potentials for the benefit of the society and the business, also, the need for industries and business to key in into the IoT technology so as to maximize productivity, efficiency, consumer satisfaction and thereby improving and boosting economic growth.*

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**Keyword:** Economy, economic growth, ICT, IoT, technology, Internet, business, industry

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### **Introduction**

The applications of ICT tools in the contemporary society, both in our everyday lives and the ways we do our businesses is increasingly becoming a necessity and a given factor for economic growth and development. Several millions of people around the world are now connected to the internet and more are will be connecting to it. This has significantly transformed and influenced business activities and thereby improving economic growth and sustainability. Nigeria as a country is actually not left out in this digital and smart

transformation, as we are now in a world of interconnectivity and smart environment. Everything around us is now used online and enabled by the internet.

### ***Internet of Things (IoT)***

The Internet of Things (IoT) is a system of interconnected computing devices and mechanical/digital devices, things/objects, animals or persons, which are given distinctive identity to identify the carrier and the ability to transmit data through a network without human-to-human or human-to-computer interaction. In Internet of Things (IoT), things are uniquely identifiable using its embedded computing system and are capable to inter-operate inside the existing Internet infrastructure. It is also a system of interconnected computing devices, both mechanical and digital machines, items, animals or individuals that are issued with identifiers that are unique to the bearer and have the capability to transmit data over a network devoid of human-to-human or human-to-computer interaction (Rouse, 2016).

Internet of things (IoT) is the network of physical devices, vehicles, home appliances, office equipments and other objects embedded with electronics, software, sensors, actuators, and connectivity that enable these objects to connect and exchange data, thereby creating opportunities for more direct integration of the physical world into computer-based systems, resulting in efficiency improvements, economic benefits, and reduced human exertions (Brown, 2016), (Ovidiu and Peter, 2013) and (Santucci, 2016).

The term IoT is comprised of the entire lots that are linked to the internet. Although, it is increasingly use to describe things that interrelate or communicate with each other (Matt, 2018). The Internet of Things (IoT) is interested with billions of physical devices in the world that are currently connected to the internet, collects and share data. Internet of Things (IoT) is mainly used for devices that would not typically be expected to have an internet connection, which is able to communicate with the network separately with human involvement and actions. A smartwatch or a fitness band can be counted as an IoT device while a PC and a smartphone, are not normally seen as IoT devices (Steve, 2018). The Internet of Things (IoT) is the connection of things such as devices, cars or homes, using Internet. Items or things we use every day can be integrated with sensors, linked to the internet and provide and share data. Every one of the connected devices works jointly and regularly exchange data and information. To a certain point, the devices will be equally the source of data and the transmitters of data. On implementation, the 5G will be the spinal column of Internet of Things (PICSMktg, 2016).



*Fig 1: Diagram showing Internet of Things (IoT). Source: <https://media-assets-05.thedrum.com/cache/images/thedrum-prod/s3-news-tmp-112560-internet-of-things--default--300.jpg>*

### **Economic Growth**

In Nigeria, the aspiration to uphold and advance sustainable economic growth for the massive larger fraction of the population through the adoption of several monetary and fiscal policies is the goal of the national economic policy. The Nigerian economic growth success has been described as bumpy and the possibility of her rapid economic growth appears unachievable as expressed in her failure to realize sustainable complete growth potentials and to greatly trim down the rate of poverty in the economy. (Uwakaeme, 2015)

According to BusinessDictionary.com, Economic growth is defined as rise in a country's productive capacity, which is measured by comparing Gross National Product (GNP) in a year with the GNP in the preceding year.

Economic growth is referred to as the increase or growth in the inflation-adjusted market value of the goods and services produced by an economy for a period of time. It is measured as the percent rate of increase in real gross domestic product (GDP), usually in per capita terms (IMF, 2012). The growth or increase in the capital stock, technological development, and improvement in the worth and rate of literacy are regarded to be the prime causes of economic growth. (BusinessDictionary, 2017)

One of the catalysts and drivers of economic growth in this contemporary world is the application and integration of Internet of Things (IoT) as an ICT tool. Integration of IoT in business and the society has the ability of boosting a country's economy, especially that of Nigeria.

### **Impacts of Internet of Things (IoT) and Economic growth**

Internet of Things (IoT) is greatly impacting on today's businesses and business models and activities. It is rapidly changing how we do our business and triggering a new wave in industrial revolution. The integration of this new technological advancement will go beyond

just manufacturing and will spread into farming, city planning, energy management, and more. This development will create an explosion of technological, economic, and global benefits. It will increase the GDP around the world, and present new economic, technical, and employment opportunities to people worldwide. Like earlier revolutions, it is anticipated that the IoT will drive up average incomes, living standards, mainly in industrially advanced economies. (Liza, 2017)

As the growth of businesses triggers economic growth, integrating Internet of Things (IoT) in ways we do our businesses and our ways of life will greatly create several impacts on economic growth. The impacts according to Jayson (2017), Anna (2017) and Munira (2017) include:

- **Regular access to information:** Many business organizations at present depend on the barcode tracking systems for use of inventory management. Once all the products, equipment, and devices are incorporated into the same network, then, inventory management and tracking becomes incredibly uninhibited. Information and figures that are updated regularly will be at organization's disposal; also, the organizations will have the ability to use those information and figures at any given time.
- **More data at companies' disposal:** Many companies are cognizant of the fact that data, for which actions are to be taken, is their most precious asset. Given that all devices are to be interconnected when the Internet of Things is implemented fully, it will certainly open the doors to data such as detailed business operations. Companies will have information about their customers/clients and their behaviour, their employees' approach to work, and other essentials elements that will help them improve their general business activities. The IoT will also transform how large business organizations and small startups companies work beginning from making everything faster to increasing productivity.
- **Everything will be faster:** With the Internet of Things in place, everything will become faster, as devices that are interconnected can include everything from cookers, coffee maker, production machines, traffic lights and vehicles to public transportation. While these happen, the organization will have little travel times for both the organization and the employees. This implies faster product deliveries and a crucial impact on the organization. This is really a luxury on one part as the organization gets what they need faster and customers will expect and want more efficient and faster service.
- **Development of Smarter products:** At initial glance, it might seem unusual to have a smart tennis racket or an internet-enabled oven, but these are simply the first expeditions into the world of the Internet of Things. Most of the products will turn into instant booms while some others may not boom. Nevertheless, business organizations will have the prospect to produce products that are more connected and smarter.
- **Cheaper energy and production:** With smart grid coordination and management, energy will be cheaper. Moreover, business organizations' machines will able to learn new, even and more efficient ways to operate. The maintenance routines will also be easier. The business organization will expend less money for production of inventory, and cost of production will certainly reduce.
- **Rise in Productivity:** The entire business will be able to function more effectively, with reduced operating cost. The cost involved in devices upgrade may be high initially, but in the end, they will be paying less for staff and production of more products. This is as a result of the solutions to the challenges the new technologies will offer.

- **Radical changes or disappearance of some industries:** Many industries may essentially change as IoT becomes common. Some industries might even become outdated or may disappear completely if they do not key in to the new technology. Some others will begin to be in top demand, while still others will become more efficient, allow for higher productivity and open the door for new entrepreneurs to emerge.
- **Tracking and Management of Inventory:** The Internet of Things (IoT) will alter how companies and industries track and manage their inventory. The integration of IoT to business and industrial operations in the near future will enable smart devices to be able to keep tracks of inventory alterations fully automatically. This is actually about the “smart office” and the “smart warehouse” and not just the “smart home” anymore.
- **Accessibility and Speed:** As consumers will have access to new ways of making inquiries and purchasing, the period of trade chain will expectedly reduce. Consumers will be able to locate and place order for exactly the product they are searching for and will require the delivery of the product in less time. This is realizable because all the technological development is tending to emphasize instant satisfaction. Consumers will be able to be served faster and more efficiently since they possess the same improved technology.
- **Efficiency and Productivity:** In addition to speed, more tasks will be to be done in fewer time frames. Also with immediate satisfaction, technological growth as well, is expected to support productivity and efficiency. This is attainable with the latest IoT advancements.
- **New Consumer Needs:** Consumers who get access to the latest types of devices will have new requirement and needs. The consumers will need things they are aware they needed before and will expect more in every new purchase. Smart devices will absolutely become the latest standard for gadgets, appliances, and perhaps even objects such as furniture, clock etc. With IoT, Consumers will also need more integration, more efficient tools, and accessories that make the new “smart” office and home-enabled lives easier and highly efficient.
- **Need for new staff:** There is will be the need to have some new set of staff. These new set of staff will be IoT technology experts who will make it successful in integrating the devices into the existing procedures. More Data analysts will also be needed in to make the use of data.

By revolutionizing the way businesses are done, Internet of Things (IoT) will definitely create several impacts in the economic and thereby increase and drive economic growth.

### **Conclusion and Recommendation**

The IoT will basically reshape our lifestyles and social relationships. The effect of IoT on the economy is already tangible, even if the IoT is still in its infancy. This is due to revolutionizing effects on how businesses are done. The potential of the Internet of Things in industries to kick start better innovation and growth is obvious. The IoT will definitely enable the creation of more and new jobs, increase productivity and efficiency, thereby boosting economic growth and development.

The following recommendations are hereby made;

- Business leaders and policy makers need to act more to make best of the opportunities provided by IoT. Policy makers have the task to create an environment which helps the IoT actualize its full potential for the benefit of the whole of society and the economy.
- To ensure greater productivity, efficiency, consumer satisfaction and reduced production cost, businesses, organizations and industries must align themselves with



this technology. This will result to the creation of smart offices, smart businesses and eventually smart economy.

- Business and industrial users of IoT technology will need to change their systems and organizations so as to make the most of the Internet of Things. They will have to invest in capabilities, culture, and processes as well as in technology.
- Consumers and individuals should align themselves with the IoT technology so as to benefit immensely from all that it has to offer and also to flow with the dynamism of the time.

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