Extension and Implementation of Nigerian Content to Solid Minerals Sector for Sustainable Digital Economy

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ABSTRACT

The need to extend and implement Nigerian content to mining sector is requested because of its successes in the petroleum sector, the pioneering sector. The origin of local content also known as Nigerian Content started earlier than 2010 when it was launched and its achievements on implementation were highlighted. Mining as one of the viable sectors of the economy that the country foreign exchange earnings is derived is not covered in the Nigerian content policy and the effect of the exclusion of the sector was investigated and the anticipated results; if the policy is extended to cover the sector. Platformization that is second to digital data as vehicle for digital economy was studied and the main core components, opportunities and challenges of digital economy were reported. The paper further studied how to make digital economy sustainable with training of workers in mining, big data, IoT, and others. It was discovered that the extension of Nigeria content to the mining sector would bring succour to the sector and there would be growth in GDP and a boost to sustainability of digital economy.

Keywords: digitalization, cloud computing, big data, Tantalum Platformization

INTRODUCTION

Nigerian content as applied to petroleum industries has yielded tremendous development in the sector and the resultant effect as witnessed in the economy shows success as the pioneering sector. Mining of solid minerals came into existence in Nigeria before the discovery of oil in Oloibiri in 1956. Tin was mined in Jos by foreign companies and exported without value addition with the use of unskilled labour; exported for foreign exchange and that has been the routine. The level of Local content in the industry is one of the criteria used in measuring the extent of the impact of natural resources extraction in a country. The local content legislation implementation in the oil sector has brought tremendous changes in the sector (Ojulari, 2020) reiterated at a Webinar that there is more potentials for success in the following sectors**:** mines, power, and Information and Communication Technology (ICT). If the knowledge from the application of Nigerian Content to oil and gas sector is extended and implemented in those sectors and the need for indigenous companies to up their games in investing on improving the quality of their products and services, and that quality should not be compromised because of local content implementation (Ugwushi & Bellema IHUA, 2010).

Mining is among the most complicated and risky business and also one of the greatest avenues for entrepreneurs' enrichment. Mining is the extraction of valuable minerals from the ores, and minerals recovered are everything to human existence. Mining is an avenue for Internal Generated Revenue (IGR) for a country that her natural resources are mined, and value added. The addition of value to minerals would increase the revenue the country derives. The introduction of digitalization in the world economy is steadily increasing and ICTs has taken the central role in these development. Digital economy is different from the traditional economy which involves the physical /contact marketing; digital economy is a process without physical contact and it is done on a digital platform using internet of things and systems (IoTs), cloud computing and big data analytics (Adeyemo, 2019).

Sustainability is a yardstick for better future and the natural resources that fuelled digitalization are the element

from mining. The mining of the non-renewable minerals without recourse to the environment, social and economy is not sustainable. The extension and implementation of Nigeria content as attained in oil and gas sector to mining sector would make mining sector boom and the internal generated revenue (IGR) boosted. Digital economy would be sustainable when Nigerian Content is extended to mining sector and the reduction of quackery in the sector by replicating the policy the way it is been implemented in the Oil and Gas companies (Ashley Dittman, 2019).

Local Content

The exploitation of earth endowed resources with minimal participation of skilled and unskilled workers from the host community birthed local content. Local content policy started with the establishment of Nigerian National Oil Corporation (NOC) in 1971 as the motor for the promotion of Nigeria's indigenization policy in the petroleum sector; and the merger of NOC's merger with the petroleum industry metamorphosed to Nigerian National Petroleum Corporation (NNPC) in 1977 which led to the actual local content initiative with the acquisition of interests in the operations of the International Oil Companies (IOCs), (Jean Balouga, 2012).

Nigerian content was launched in the year 2010 and since then it has been operational with tremendous gains in the petroleum industries. Nigerian Content is a percentage of the major value added or created in the economy through the application of human and materials resources available in the host for the provision of goods and services to the petroleum industry within acceptable quality, health, safety and environmental standards in order to encourage the development of indigenous capabilities (Nigerian Oil and Gas Development Law 2010). Local content is defined as the value addition in the host country economy (Sigam, 2012).

Local content is the same as "Nigerian Content". Nigerian content is a national agenda that contributes to the development of the national economy through the participation of all economic segments that are represented in private and government sector (Jean Balouga, 2012).

Achievements of Nigerian Content in the Petroleum Sector

1. Employment**:** many workers both skilled and unskilled workers have direct employment in the oil and gas multinational companies while, others in the subsidiary companies.

2. Indigenous Companies**:** increase in the numbers of crude oil exploration and production companies in the sector; examples Eroton, Seplat, Aiteo, Oando, First E&P, as well as the Nigerian Petroleum Development Company (NPDC). These local companies are competing with multinationals and account for 20% of Nigeria's oil production and 60% of domestic gas production. The numbers of Rigs and marine vessels owned by Nigerians has increased from 3% to 40% currently (Godwin Oritse, 2019)

3. Fabrication**:** there is tremendous growth in the number of local companies that involves in fabrication; instrumental to the fabrication of the topsides of the EGINA FPSO modules by Samsung Heavy Industries Limited (SHI-MCI) at LADOL Yard in Lagos (Niyi, 2021).

4 Research and Development**:** establishment of a $50m Nigerian Content Research and Development Fund aimed at driving the development of indigenous technology and innovation.

5 Capacity Development**:** to meet the standard for employment into oil and gas companies there is need for enhancement of local capabilities by training of local workforce in Nigeria higher institutions or foreign universities, and training institutes to acquire the requisite knowledge, skills, expertise and knowledge transfer from Engineering, Geology, Geoscience, and Management are necessary (Nigerian Oil and Gas Development Law 2010).

Mining

Britanica.com defines mining as the process of extracting useful minerals from the surface of the Earth, including the seas. Mining in a wider sense comprises prospecting, evaluation, extraction, analysis of the profit potentials of a proposed mine, and lastly the reclamation of the land to prepare it for other usage when the mine is closed.

The application of engineering and mining skills to bring the ore to the surface for further processing for economics gain is the basic aim of mining. Mineral processing follows mining and it prepares the ore for extraction of the valuable metal in the case of metallic ores but, also produces a commercial end products of non-metallic minerals. The 20th century has seen the development of mineral processing as a serious and important professional discipline in its own right and without physical separation the concentration of many ores and particularly the metallic-ferrous ores would be hopefully uneconomic (Wills and Atkinson, 1991) and (Adeyemo, 2019). Mineral processing is usually carried out at the mine site and the plant being referred to as a mill or concentrator.

The Effect of Non-Inclusion of Mining Sector in Nigerian Content Policy

The non-inclusion of the mining sector in Nigerian Content has necessitated the following**:**

Proliferation of illegal artisanal miners**:** in order to escape the payment of taxes and other royalties, some small scale and artisanal miners indulge in illegal mining. As a matter of fact, most Nigeria's mining is conducted informally at levels as high as 80% of activities in some regions of the country which is not necessarily of Naira earnings. The government needs to bring these miners into a legalized framework via making them real start-up miners and ensuring they pay government the right set of taxes and royalties (Adeyemo, 2019) and (Udoh & Victoria Imoh, 2022).

High risk and health hazards**:** the high riskiness of mining in Nigeria is due to the fact that the mineral sector in Nigeria is mainly driven by the artisanal and small-scale miners who deployed low technology and crude/traditional methods in their activities. They are exposed to high risk from dangerous metals such as lead and radioactive waste. Cases of transcend of the limit considered healthy has been recorded in some mining locations in Nigeria (Adeyemo, 2019), and (Udoh & Victoria Imoh, 2022).

Low productivity**:** For the amount of minerals extracted to be reasonable rather than inadequate, the extraction process must be merchandised instead of manual. The use of spades and other crude implements to excavate the ground, similar to the lotto extraction method will not yield products in sufficient or comparable amount in relation to that done with advanced tools and machinery such as excavators and bulldozers.

Over dependence on import**:** mining sector is one of the primary industries, products from the sector are raw materials for manufacturing companies and due to no value addition, the minerals are mined, exported and the processed is imported as raw materials for manufacturing sectors. Lead is mined and exported cheaply to China, and the processed imported by our battery manufacturing companies using forex (Arc Adegbite, 2022).

Reduction in foreign Exchange**:** mining sector is an avenue for generating revenue through sales or export of minerals. The main operators are Artisanal Miners, and their minerals traded at lower price because there is no price regulation, and the implications of this manifest in less revenue accruing to the government, and Experts estimate of the resulting capital flight from Nigerian Economy to be over $8b yearly (Arc Adegbite, 2022).

Unemployment**:** big investors in this sector are multinationals and they do not employ the numbers of expertise or professionals that are supposed to be on their list of employees, hence under payment of the employees employed.

Digital Economy

Towards the end of the third industrial revolution comes tremendous development with the introduction of smart system, nanotechnology, and others, birthed digitalization. Digital economy is the economy based on digital computing technologies and it is sometimes called the internet economy, web economy, and cannot be differentiated from traditional economy because they are inter-related. Economy of a system is the one that produces and distributes goods, and services in an effort to meet the needs of the society. In traditional economy, physical products are purchased from vendors store in exchange for currency, while in digital economy the same products can be purchased using internet connection without physical meeting and payment using digital currency like Bitcoin or electronics transfer (Litvinenko, 2019) and (Richard O. & Terje V., 2022).

Digital is fast becoming increasingly inseparable from the performances of the economy. Digital economy continues to progress at a fast rate, driven by the ability to collect, process, and analyze big data. Digital economy is a worldwide network of economic activities, commercial transactions and professional interactions that are enabled by transformation and communication technologies (ICT). Digital economy encourages used and disposed-off, as such most electronics are now made in a fashion that when your model is obsolete its performance drops. This made new models flood the market continually leading to an increase in the use of raw materials and boosting recycling business.

Marianne B. (2021) "Platformisation is the process of capturing core functionality in abstractions that minimize the need for software engineers to build support for that functionality themselves. Often this takes the form of tools or frameworks that exist between piece of technology, and the application built on it". Digital platform provides the device for joining a set of parties to interact online, and there are two types of platform; transaction, and innovation platform. Transaction platforms are multi-sided markets with an online infrastructure that supports connections between a number of different parties and had developed to a core business model for major digital corporations. More companies and new business models that would not have been, were created and there is prospect for more entrepreneurs birthed by these technologies that fuel digital economy. The new companies are market place platforms; Amazon, Alibaba, and Ebay; the ride-sharing platforms; Bolt, and Uber; Hotel reservation, and home rental platform etc. Innovation platforms is a platform for building and growing ideas for technical solution where you can build things fast, prototype and also creates environment for code, content producer and applications and software operating system (Android or Linux) or technology standards (MPEG video).

The Main Components of Digital Economy

Electronic-infrastructure**:** refers to the core aspects (computers, telecommunication devices) or foundational aspects (semiconductors, processors) and enabling infrastructure (internet and telecoms networks) of the digital economy that enables the execution of transactions.

Digital and information technology sectors (Electronic-business)**:** involves transactions of buying and selling, marketing, delivery of goods and services using digital technologies, e.g. digital platforms and mobile applications. Electronic-Commerce**:** is a transaction that involves sales of goods and services through digital platforms and exchange of currency via transfer or the use of crypto-currency (Nawarathna B., 2019).

Opportunities of Digital Economy

Increased competitiveness and employment opportunities helps to increase business strategies using technology and internet infrastructure to reach out to customers, improve their brands, and increase employment opportunities by creation of new jobs, global sprout and spread of new jobs.

Better quality of life**:** The digital economy had made it possible that working can be done from anywhere in the world without confinement in an office space, this helped workers to strike a balance between personal life and official. It manifested during Covid-19 pandemic when workers were told to work from home, access information, education, communication, and others, which were through internet.

Reduced costs and improved efficiency: digitization and digitalization has changed businesses from manual to automated processes resulting to reduction in the cost of doing businesses, lower prices of products and services, and satisfaction of customers. Digitalization has made businesses to become more efficient by reducing errors due to manual tasks and the time waste in traveling to market is removed and transactions are faster (Tang X., & Wu Qiong, 2021).

Innovative and increased transparency**:** to remain in business in digital economy there is room for innovation. It is at innovation that intelligence and smartness come to play otherwise the business would collapse, but because of transparency, business owners and customers share information on digital platform.

Improved communication**:** interconnection between business owners and customers in digital economy made

communications very easy and with many channels for example; businesses can reach out to customers via social media, short message service(SMS), email, and a host of others (Paul M., & James W., 2001).

Challenges of Digital Economy

Digital divide**:** There is a big margin between those who have access to the technology and those who do not, and this has cause existence division between countries and within countries; there by creating inequality in the world.

Cybercrime and data security**:** the development in technology has led to criminals using digitization for heinous crimes like identity theft, fraud, and money laundering. There is also risk of leakages of customers information obtained, and stored in the cloud.

Job losses and Privacy concerns**:** it is envisaged that digitization would lead to redundancy of some workers, some companies closing their businesses due to inability to ingenuity. Also, there are concerns about misuse of data obtained from their various customers due to massive data available in their cloud (Digital economy growth and mineral resources 2020).

Electronic Infrastructure and cartel**:** the challenge of small businesses is the huge investment required for the expansion and upgrade in technology for digitization of the economy and some big companies have developed to be very powerful as a result of digital economy.

Implementation of Nigerian Content in Mine Sector

Most developing countries are not capable to mine their earth endowed natural resources locally as such they seek investment from multinational companies. Mining sector is the economic activity that is primarily determined by geology. When this laudable policy is extended to mining sector it would help to reposition the sector as one of the driving force of the economy.

Human capacity development and indigenous Companies enhancement of local Capabilities by training of local workforce in Nigeria or foreign universities, and training institutes to acquire the requisite skills, and expertise knowledge transfer from geology, geoscience, engineering, and management will equally assists in boosting the local content in mines sector, which will increase the numbers of local companies in mining of ores/ minerals and also showcase additional values in the mine sector. These will equally enable the growth of fabrication, construction crushers, and pulverizes in our local content companies. (Oyeniyi A., 2022; Digital Economy Report 2019).

Employment**:** many skilled and unskilled workers would gain direct employment in the mine sector and others in the smelting and refining companies. It would reduce numbers of unemployed youths and banditry (Oyeniyi A., 2022).

Research and Development**:** Solid Mineral Development Fund (SMDF) should be empowered to sponsor researches that would drive development of indigenous technology and innovation. More also, the funds released to this department should be monitored, and ensure it gets to the appropriate local investors to enable them for their support.

Internal Generated Revenue (IGR) and Infrastructure Development**:** the internal generated revenue from the mine sector would rapidly increase, boom and provision of basic needs for the locals to improve the quality of life and stimulate their economic growth infrastructure such as; roads, electricity and pipe-born water will be available in the system (Oyeniyi A., 2022).

Sustainability of Digital Economy

Digital economy is becoming increasingly attached to the functioning of the economy as a whole. Digital sustainability may be defined as actions that employed digital technologies creatively to meet Sustainable Development Goals (SDGs). (Carmen N. C., 2011) reported “sustain that digital economy modifies the relation

of human being with environment, changing the business models and propose the concept of sustainability". Sustainable businesses have both individuals and groups in mind focusing on economic, environment and social objectives. The following points would make digital economy sustainable: Innovation and productivity growth with consideration of social outcomes, and improvement of the economy, and the steady growth communication that reduces the time and speed for connectivity. Aggregator and knowledge process outsourcing are form of digital economy while the latter outsources knowledge, assembly, analyzing, managing, and trades on products are branding companies as well. They foster the production of higher quality goods and services at reduced cost making the products affordable thereby reducing the digital divide. Digital economy is open to all as long as you are growing with the trend in technology and innovative. Creation of new channels for value addition to the minerals resources through implementation of Nigerian Content in mining sector is also encouraged. (Carmen N. C., 2011).

Special task force should be set up to protect data privacy and data security against deliberate act of data misuse on digital platforms. Presently, only European Union has a comprehensive approach to data protection with global implication through General Data Protection Regulation (GDPR) that started May 2018. Good investments on ICT's would be more profitable, productive and competitive and this is to promote ICT's skills development into general business management training curricula. (Oksana N., & Tatiana F., 2021).

Government should upgrade Electronic-infrastructure and also consider collaboration with the private sector to provide more training to Micro; Medium Small Enterprises (MMSMEs) empower women in digital technologies by mentoring, vocational training, internship and apprenticeships on how to leverage on digital platform. (Michael M., 2005)

Manufacturers of electronic gadgets and others used to drive digital economy should ensure recycling policy and considered to ensure that the required raw from the mines is reduced and the electronics waste generated would be recycled. Digital economy allows competition of businesses and allows its growth and consistent for a long time. The used of skilled workers would reduce quackery that are not mindful of human health from pollution, and toxic activities in the mining sector. (Michael M., 2005)

CONCLUSION

Extension and implementation of Nigerian Content to mining sector would increase internal generated revenue (IGR) from the sector and would lead to sustainability of digital economy. There would be employment and reduction in insecurity as many locals would be employed. It is clear that mining sector is everything and without it there would be anything. Sustainability of digital economy would be achieved when skilled professionals are used in mining sector, Upgrade of electronic-infrastructure, professional and vocational training of locals in ICTs in the mining sector a welcome development. Formation of cyber security to protect data privacy and security in order to avoid data misuse a serious issue to be considered.

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