

# Consumption of Foreign Software and its Effect on the Development of Indigenous Software in Nigeria

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**Abstract:** *This study examines the effect of consumption of foreign software on the Nigerian economy and its attendant repercussion on the development of indigenous local software. The study was made using the data of registered software agreements sourced from the National Office for Technology Acquisition and Promotion (NOTAP). The agreements were submitted to the Office by companies and other organizations doing business in Nigeria for registration and for the purpose of remitting software fees to foreign licensors for using the software to run their business activities. In using the data, the investigation examined the volume of fees that went into the payment of software license fees abroad. Also, the impact of the consumption of the software on the development of indigenous software was also studied and the strategy put in place, such as the issue of local vendor requirement, were carefully highlighted.*

**Keywords:** Local software developer, foreign software spending, NOTAP, NITDA, software agreements

## 1. Introduction

Software today is truly ubiquitous, playing visible roles in computer systems all around us, as well as relatively invisible roles, embedded in a myriad of places where the users are not typically conscious of it as software, from miniature electronic devices to appliances to automobiles. More important, all of our critical national infrastructures, from the power grid to our transportation systems, from our communications networks to our financial infrastructures, literally run on information technology with the software as the main driver. There is a popular slogan which says "even a single day without computers leaves us feeling paralytic" [2].

Today, we live in a world that is driven by information technology, and the software industry, which has been a source of galloping income for some countries, is the driving force [Obaro, 2012]. Software has made us completely dependent on computers for even the simplest day to day task. A faster and more powerful economic and technological development has taken off in Africa thanks to the advent of ICT and the Nigerian software industry is likely going to become the most significant regional player going by current developments in the country.

There are so many opportunities for the software industry in a developing economy like Nigeria given the low capital entry requirements as well as the industry's for the software industry is human capital and with the country's size and abundant supply of low cost software engineers or graduates, majority of whom are self-taught, the country stands a chance to provide highly skilled professionals with absolute wage comparative advantage in the international software market.

Over the last two decades Nigeria witnessed a monumental transformation in many sectors of the economy facilitated by ICT and related products. Among the first sectors that received the accolade of ICT revolution are the financial and

telecommunication sectors of which the banking sub-sector stands supreme.

Many years ago in the banking sector business operations were mainly conducted manually. Such tasks include preparation of cash books, journals, general ledgers, final accounts and reports. These however accounted to greater extent to the long delays in providing financial services to customers, long queues experienced in banking halls, long turnaround time in meeting customer's requests like cheque books requisition, raising drafts, processing of loan requests, withdrawal/deposit of cash, trade payments etc.

Today, thanks to the emergence of ICT, the story has changed significantly for better as a result of the investments made in the acquisition of ICT facilities and related banking software applications. Nowadays, under the platforms of e-banking business operations are carried out smoothly and promptly. Other services that witness changes, which are, hitherto, provided manually, are the cash dispensing process. With customized software applications, the banks operates its cash dispensing operations using the Automated Teller Machines (ATM) which are installed in many strategic locations and galleries both within and outside banking premises. This has tremendously reduces manual human services and valuable transaction time.

Likewise, in the area of security software has made a tremendous impact by facilitating banks to offer banking security using modern security gadgets such as rotating doors, metal detectors, surveillance cameras, etc. both inside and outside the banking premises.

In addition, the introduction of on-line e-banking platforms has made it simple for customers to make transactions with the banks. Under e-banking platforms customers can now perform his/her transaction online without having to visit the banks physically as it used to be in the past. These remarkable transformations were all made possible due to software products.

The telecommunication sector is another area that receives unprecedented growth (Ikponmwosa, 2013) due to the ICT transformation. Before the beginning of this millennium telephone interconnectivity is only made possible through land lines, which runs on installed metallic cables. Interconnectivity between a receiver and a caller used to be a nightmare. However, with the advent of ICT and its operational facilities such as GSM telephones, internets, satellite TVs, etc., and other associated services telephone connectivity became a soft ride.

## 2. Background Information

Information and Communication Technology (ICT) of which software is the driving force is generally recognized as a potential tool that can minimize the gap between developed and developing countries in the area of e-development. It can provide a great impetus for developing nations to leapfrog from the stages of development through a well planned and sustained management strategy of ICT that can provide a national guideline on how ICT can be harnessed (Zaied, 2008).

Investment in ICT contributes to overall capital deepening and therefore helps raise economic growth. The greater use of ICT may help countries to enhance their administrative prowess, reduce their costs of governance, enhance their productivity and increase their overall efficiency, and thus raise economic growth.

Moreover, Software products and the services it offers are essential for the growth of the economies of the developing countries; and the launching of programmes to promote strong and indigenous software economy is a priority task (Fialkowski, 1990).

It is feared that unless technologically advanced areas have a chance to catch up, the increasing technological advances in developed nations will only serve to exacerbate the already existing economic gap between technological 'have' and 'have not' areas (Obaro, 2012; Isizch, 2013).

Moreover, greater use of ICT may contribute to network effects, such as lower transaction costs, higher productivity of knowledge workers and more rapid innovation, which will improve the overall efficiency of the economy. ICT is now the ultimate tool that is employed universally to achieve economic development and growth.

Nigeria belongs to the countries in the digital divide, with unequal provision of opportunities to access and contribute to information, knowledge and networks and to benefit from the development- enhancing capabilities of ICT.

Even though, the country has the potential to obtain a vibrant software industry which is, indeed, humongous and realistically existent; especially with an average population of 173.6 million citizens and multi-billion petrol dollar resources. But, the horrendous dearth of skills aggravated by dysfunctional system of education exacerbated by weak government policies are making it impossible for Nigeria to move out of the digital divide family.

Software presents Nigeria with an opportunity to take high up position in the global ICT value chain. The realization that ICT provides unprecedented opportunities to effectively fight against poverty by supporting the poor in business development, foster empowerment of the poor, facilitate access to education and health, help improve the environment and prevent natural disasters is a compelling factor that will make Nigeria channel its multibillion dollar petrol resources to wage an effective strategy to attain the infrastructural requirement necessary to become an ICT compliant nation.

To achieve this laudable objective Nigeria requires a comprehensive and robust ICT policy and to invest heavily in the acquisition of other important tools and facilities.

In the interim Nigeria can only rely on the importation and outsourcing of these ICT driven goods to power to achieve economic transformation agenda. The gradual and continual appetite for ICT goods has catapulted Nigeria into the committee of nations with the largest consumption of foreign ICT products in the continent.

### Issues confronting software development in Nigeria

Experts have recognised that ICT is pivotal to the development of any nation and as such, any development model without a concrete plan for ICT's contribution is doomed for failure. Much of the developed world's economies are underpinned by ICT even as it takes the front row in the development agenda of emerging market economies including the BRICS. Brazil, Russia, India, China and South Africa (the BRICS) have built their economic development models around ICT. The importance of ICT in economic development is evident in the industrial and technological hubs of Shanghai in China, Bangalore in India, Sao Polo in Brazil, Johannesburg in South Africa and Moscow in Russia. These centers are known for their technological advances in the realm of aero, automobile, computer software and ICT technologies.(Ref)

Nigeria has a huge software potential which has been estimated to be about \$20 billion if properly harnessed (ATCON, 2008). This could supplement the revenue generation from oil and moved Nigeria away from a monolithic economy, which is dependent on oil.

Nigeria is a giant software consumer nation with a population of over 180million. For instance in terms of internet usage Nigeria is rated as the 11<sup>th</sup> highest internet user. Over the last decade the consumption of software products to run the economy of Nigeria by especially some strategic sectors such as banking & other financial institutions, telecommunications, industry, education, government, energy and power sectors and other business sectors has run into billions of Nigerian Naira. All of which are for the payment of different software applications used to run businesses and other operational activities. The payments are also made using Nigerian foreign reserves.

While these are happening the domestic software development industry over the years has suffered from neglect and stunted growth as a result of the activities of the multinationals software companies operating both from

within and from outside. The local software industry is therefore left to face series of challenges from the lack of enough patronage of its products by local end-users.

Lamentably, the local software companies are left to be at the mercy of the multinationals who eventually engage the local software companies to carry out retailing and computer services on their behalf. In some instances the local developers are engaged as marketers/resellers of the foreign software products.

Therefore, because the local software industry cannot find market for its products, they are left undeveloped and short of even the most basic facilities to make their presence felt in the industry.

The industry also lacks enough and qualified software professional to develop the sector and produce quality products that can compete favourably with the foreign software coming into the country. The existing workforce in the sector is not skillful enough to the level needed by the industry for rapid transformation and competitiveness. Such skills include marketing skills, domain skills, programming skills, to mention but a few.

Also, the IPR system in Nigeria is not well developed and Intellectual property rights are usually not protected due to poor enforcement of the Copyright Act. These weakens the avenue of owners of copyright the opportunity for them to reap the reward of their intellectual work

It been recognized that lack of enough motivation from the government to the ICT sector such as provision of financial incentives, rewards tax rebate, etc. have hampered the commitment of software developers and young talents into the business. This is unlike the situations observed in other software developed nations where successive governments put in deliberate strategy in terms of incentives to assist the local software companies to keep them committed to their arts of developing software products.

Furthermore, the Nigerian system failed to adopt enforceable regulations that are aimed at protecting the local software industry against unfair competition and also to encourage the patronage of the local software.

To compound the matter, local software developers do not possess financial requirements that are needed to access loans facilities from financial institutions in the country. The availability of financial capital of the local software firms are meager and cannot meet the collateral requirements imposed by the financial institutions before loans can be granted to them. On the other hand multinational corporations can access these loans very easily due to their financial footing disposition and use it to their advantage to expand their business activities at the detriment and the survivability of local software industry.

Another issue confronting the local software developers is copyright infringement. Due to weak government enforcement regime the protection of software products developed locally suffers from infringement. Infringers of Nigerian software take advantage of the weak IPR system

and lack of enough IPR knowledge to steal the intellectual property from the local developers. The ideas embedded in the products are taken abroad modified and returned to the country to be sold as a foreign software, which is customised to suite the Nigerian domain.

Lamentably, the public educational institutions in Nigeria are no longer providing the quality training as before, which is needed to produce the critical mass of highly skilled graduates necessary to develop the sector in tandem with what is obtained in the multinational software companies. The quality of education offered by the tertiary institutions in ICT courses is not qualitative enough to produce the future professionals to run the industry. In most instances the trainings are provided by the ICT practitioners to the new recruits in order to meet-up with the minimum standard required to successfully operate the business.

Nigerian software industry is also faced with the absence of a vibrant research and development (R&D) activities either in the public or private sectors. Lack of R&D activities hinder the evolution and development of new and improve software products that can meet the demand of the business sector compete positively with the imported global ICT products. As such the sector lacks collaborative efforts such as the public-private-partnership arrangement (PPP) that can drive and sustain research activities in the sector, thereby, propelling the growth and development of software products for the country.

In comparison, multinational software companies operating in Nigeria have the advantage of accessibility to well equipped, state-of-the-art R&D laboratories in their parent companies abroad. These facilities make it possible for them to carry out any upgrading, and research and development works on future software applications cheaply and efficiently.

### **Nigeria Foreign Software Spending**

There are dearths of statistical records that can accurately confirm when the consumption of foreign software started in Nigeria. The data used in this investigation is solely and entirely obtained from the records of software registrations made by companies with NOTAP. Based on the records we can state that consumption of software products in Nigeria started in the year 2000.

In the early years factors which instigate the spending on foreign software products may include the rush to automate business operations from analog system to digital system, with the offer of a promising future of a quick economic prosperity. So, with the arrival of the new democratic dispensation and global transition to ICT digital economy there is the need for the country to harness ICT as a major enabler (Isizch, 2013)

The development of local software infrastructures can lead to many positive externalities, and is a necessity if developing countries like Nigeria are to adapt software technology to suit particular local needs.

The advent of ICT compels attention to ICT literacy, because lack of ability to take full advantage of ICT will lead to poorer nations falling behind in a globalised world. When the poorer nations are not able to catch-up with ICT knowledge, the gap between the incomes of poor and rich nations will widen (Jide, 2018).

Moreso, Information Communication Technology (ICT) is a phenomenon that fits into the globalization project of empowering gender and sustainable poverty alleviation in a nation's economy. Nigeria is a nation bedeviled by the syndrome of poverty amidst plenty.

To meet the challenges of globalization, fight poverty scourge and achieve a successful and vibrant economy Nigeria must as a matter of priority launch a robust and sustainable ICT regimes through the emergence of national ICT policy.

As a result of coming into being of a national ICT policy in March 2001 other supporting agencies were established side by side to participate in the actualization and implementation of the policy. Some of these agencies include the National Information Technology Development Agency (NITDA), the Nigerian Communication Commission (NCC) and the National Office for Technology Acquisition and Promotion (NOTAP). The agencies were charged with the specific mandate on the national ICT policy.

To protect the interest of the private ICT businesses in the implementation of the national ICT policy similar institutions sprang off. Some of the private organizations are ISPON (Institute of Software Practitioners of Nigeria), Nigerian Computer Society (NCS), IT Industry Association of Nigeria (ITAN), Association of Telecommunication Companies of Nigeria (ATCON), etc.

However, a previous study on the profile of Nigeria's software industry has indicated that despite the existence of both the public and private ICT institutions that participate in the effort to make Nigeria an ICT capable country in Africa and a key player in the Information Society by the year 2005 (Akintaro, 2015) the anticipated impetus to accelerate the development and growth of the sector did not materialized at the expected time (Soriyan, 2004).

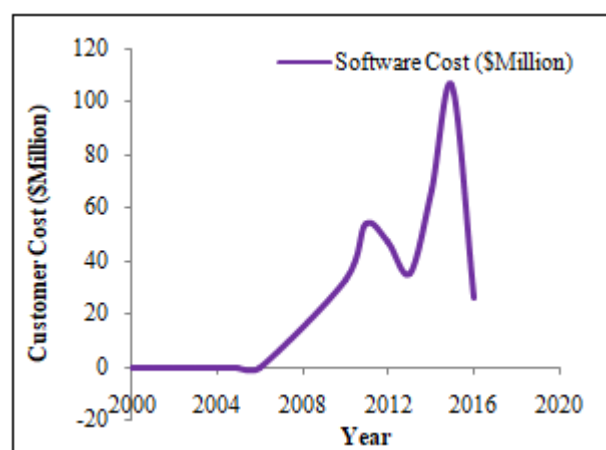
Empirical record has shown that by 2001 only about 130-150 ICT firms exist in Nigeria, which are privately owned. The study further reveals that there was a gap in the spread of the ICT firms across the country. The distribution shows that all the firms established, as at that time, were all located in only 14 states out of the 36 states of the country and the federal capital territory. About 80% of the firms are situated in the south with Lagos (The hub of Nigeria's economic activities) having the largest concentration of ICT firms. While only about 20% of the software firms are located in the northern part of the country (Soriyan, 2004).

The investigation also discovers that about three quarters of the local software firms relied wholly or partly on rendering services – such as installation or modification – related to foreign packages. There was no indigenous development of software tools, and there was certainly a perception of

growing penetration of the market by foreign products that were displacing locally-developed applications.

Conversely, most recent study carried out has indicated that by every standard, the Nigerian ICT sector has recorded some improvement in 2001. This is evident from the landmark celebration to mark the attainment of 125 million totally committed GSM lines, thereby making the country one of the fastest growing economies of the world (Jide, 2018).

Today, ICT products, such as e-governance and e-business, have pervaded all the nooks and crannies of service delivery system both in the public and private sectors of the economy. Thereby, constituting a great consolation to the way public and private activities are run. Virtually all facet of governance is now ICT compliant.



**Figure 1:** Trajectory of Software Spending (2001 -2016)

Source: National Office for Technology Acquisition and Promotion (NOTAP)

Fig. 1, above, is a trajectory of the Nigerian annual foreign software spending and its associated services from 2000-2016. Based on foregoing assertion, Nigeria's software spending started in the year 2000, though, at a very low amount. That year marks the beginning of penetration of business software objects into the business sector of the economy.

Between 2000 and 2006 there is a slow, but steady upsurge in the amount of software spending in the country. Perhaps, this may the period when most businesses were embarking in restructuring process to automate their business operations in line with the global ICT digitalization revolution.

By 2010 there was an exponential increase in the amount of software spending in the country. This giant stride could be as a result of the massive and excessive importation of software applications by all the sectors of the economy. The surge in software spending reaches its peak in 2015. This paradigm shift in software spending is a manifestation for the demand of foreign software products, which was worth several millions of dollars.

However, between 2011 and 2013 there was a sharp decline in the volume of software spendings. This slump may be due partly to the improvement in the level of diffusion and



penetration of local Nigerian software in the country (Soriyan, 2004) or due partly to the decline in demand for foreign software because the market has become saturated with foreign software applications.

Between 2013 and 2015 the drops in the software spending experienced in the preceding years starts to grow up again. Two factors may be responsible to for the latest rise in software spending. First, this could be as a result of new incoming investments into the country, especially in the telecommunication and manufacturing sectors. The two sectors are the highest consumers of software products. The new favourable investment climate and the ease of doing business policy introduced by the government culminate in attracting the flow of more and more investments into the country thus, boosting the consumption of more software technologies. The second reason for the hype in software spending could be attributed to the introduction of new and upgraded versions of existing software applications, which are better and perform more efficiently than the versions. End-users are therefore prompted to adopt the new versions in order to optimize their performance.

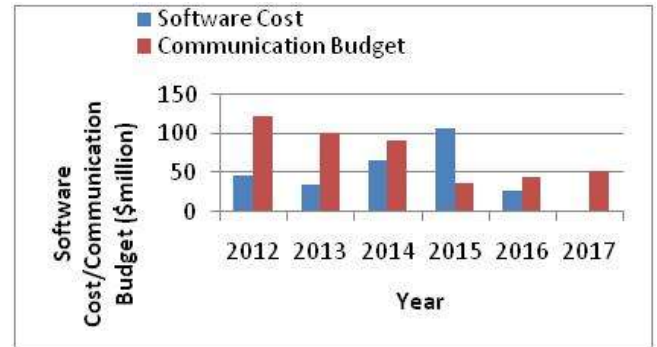
**Table 1:** List of Foreign Software Vendors and the Types of Collaboration

Software Company	Types Of Software Collaboration
Smart Steam Technologies Limited	Distribution Agreement
Oracle Systems Limited	Oracle Network Agreement
Redington Gulf	Software License Agreement
Centum Learning Limited	Training Services Frame Work
Mobile Technologies Limited	Service
Cloudflake Incorporated	Reseller Agreement
Affriad Company Ltd	License Agreement
Vericash	Software License Delivery Agreement
Veripack Gulf, FZF	Veripark Gulf Partner Agreement
UAB Alkynes Sertokius	Platform and Products License
Infosys	Custody 2000 Licence Agreement, Finacle Software License Agreement, Finacle upgrade Project sow
Microsoft	Microsoft Open license Agreement, Microsoft Statement of Network
RiskVision	Provision of Consultancy for the Analytic and Data GAB Analysis for Enterprise Risk Management
IBM	Operating Sys Middleware & databases
SAP AG	Operating System Middleware & databases, Enterprise Software

#### Foreign Software Licensors Doing Business in Nigeria

Table 1 above is the list of the foreign software vendors that are involve in marketing of software products in the country. Observations has shown that with the exception of the multinational ICT companies, such as, Microsoft, Oracle, IBM and Infosys the rest of the companies are subsidiaries or offshoots of one of the multinational software corporations. As such, their global financial revenues are incorporated into those of the parent companies.

#### Comparison between Nigeria's Software Spending and Communication Budgetary Allocation



**Figure 2:** Nigeria's Software Spending versus Budgetary Allocation to the Communication Sector

Fig. 2 is a bar chart plot of the annual software spending and government allocations to the communication sector for the year 2012 to 2017. From the plots it is quite clear that foreign software spending during the year under review are substantially lower than government allocation to the communication sector. The only time that foreign software spending was higher than the communication budget was in the year 2015.

However, despite the relatively large difference between the two spending observation has shown that foreign software continues to dominate the software market in the country compared to the local software.

Even though, there are many locally developed software that are installed in many government agencies such as the National identity Management Commission (NIMC), Office of the Accountant General of the Federation (OAGF), Federal Inland Revenue Services (FIRS) and Central Bank of Nigeria (CBN) (Olajide, 2018), which are performing wonderfully nevertheless, the country continues to remain heavily reliant on foreign software products.

To compliment the effort Nigeria has set off many national software initiatives, such as the Nigeria Software Development Initiative (NSDI), aimed at harnessing the nation's abundant intellectual capital whose genius and creativity in software development could jump-start Nigeria's participation in the booming global software industry (Jide, 2018).

There are many convergent factors that can linked to the lackadaisical growth of the software sector in spite of the relative annual resources that are expended on the communication sector in Nigeria.

Chief among them is the poor patronage of made in Nigeria software products. Nigerians have grown strong appetite for anything foreign and always pride themselves in imported products than homegrown products (Olajide, 2018) to such an extent that they always prefer to patronize foreign software products than the local software. This is apparent even when the local software product perform better task than the foreign product. Lack of patronage is one of the greatest problems confronting the software industry in Nigeria (ATCON, 2008). It is also a major concern that has kept potential software practitioners out of the business or to remain uncommitted to the profession.

The lack of domestic market in the initial stages of marketing their services renders the local developers with no option but to strive for other market abroad. This tendency normally leaves them without the benefits of the experience that would be obtained from the validation of their products from domestic customers (Momodu et al., 2007). As such, the local software products will not be subjected to the process of further improvements in order to meet the global software standard and compete favourably with products produced by the multinational software companies.

In addition, there is deficiency in capability of enough marketing skills on the part of the local developers to brand and market their products competently. This setback is even aggravated by the unfortunate economic situation prevailing in the country (ATCON, 2008), which impedes software creators from acquiring marketing and other professional skills.

Software development entails a lot of developmental stages ranging from product conceptualization to product development, testing, prototyping, market testing and mass production. The process involves special skills that are absent with local software developers as it is outside their areas of competence. Moreover, commercialization requires professional affiliation to business courses and who the software companies may be reluctant to employ or to

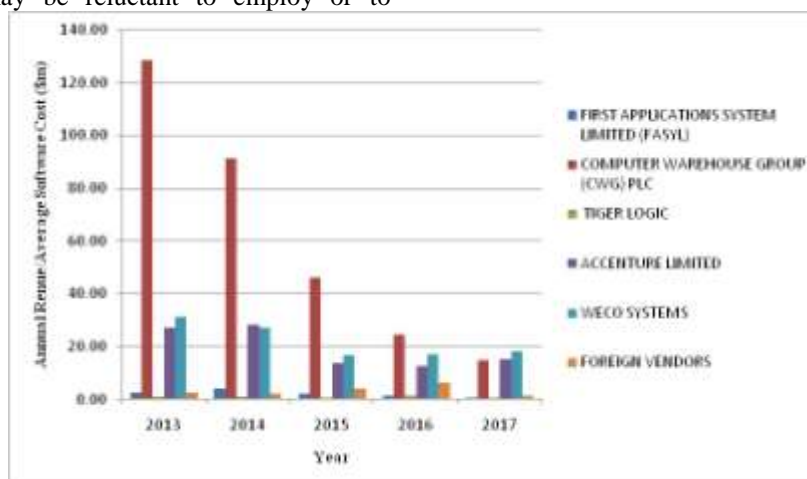
engage. Although the allocation to the communication sector is large observation has shown that the large chunk of the money is spent on administrative matters, payment of workers' wages procurement of hardware and other products, etc. Only small chunk of the money is channeled toward the implementation of ICT programmes with minimum impact on the sector (Ayodeji, 2015).

The local software vendors themselves share some blame in the problems confronting the growth of ICT growth in the country. Nigerian software vendors benefit hugely from the profit they are making from the importation of software solutions and offering of support services on the application. They have maneuvered themselves to profitability from the importation and marketing of foreign software in spite of damning socio-economic decadence (Ayodeji, 2015).

### Comparison of Financial Strength between Local Vendors and Multinational Foreign Vendors in Revenue Generation

#### Local Revenue Generation

In this comparison, the projected annual revenues generated by five local Nigerian vendors and the average values of the total revenues generated by foreign vendors



**Figure 3:** Annual Revenue Some Local Software Vendors VS Average Revenues of Foreign Vendors in Nigeria

In Nigeria between 2013 to 2017 is presented in a bar chart plot (figure 3) above. It can be seen from the bar chart in fig.3, above that the revenues generated by the local vendors locally are substantially higher than the average revenues generated by foreign vendors.

**Table 2:** Global Annual Revenues of Multinational ICT COYS

Year	Annual Global Revenue (\$M)			
	Microsoft	Oracle	IBM	SAP SE
2012	73,713	35,684	25,448	4,835
2013	77,849	37,180	25,932	4,399
2014	86,833	38,275	25,434	4,516
2015	93,580	38,226	22,932	4,658
2016	85,320	37,047	18,187	4,107

**Source:** <http://www.google.com/annualfinancialrevenue/nameofcompany/year>.

**Table 3:** Projected Annual Revenue of Some Local IT Companies

Projected Annual Revenue of Local IT Companies				
First Applications System Limited (FASYL)	Computer Warehouse Group (CWG) PLC	Tiger Logic	Accenture Limited	WECO Systems
2.45	128.56	0.99	27.12	31.11
4.25	91.22	1.13	28.41	27.01
2.35	46.30	0.63	13.74	16.73
1.38	24.45	1.32	12.66	17.21
0.62	14.89	0.71	15.20	18.07

**Source:** National Office for Technology Acquisition and Promotion (NOTAP)

#### Global Revenue Generation

From table 2 and 3 when the global revenue generations of four multinational ICT companies operating in Nigeria are compared with the annual revenue generations of the five local companies the figures reveal that local companies are

nowhere near the multinational IT companies in terms of revenue generation. This shows that the corporate and investments potentials of the multinational corporations are exceedingly higher in all respect than the local companies (ATCON, 2008) competitive edge over software development and its market control greatly favours the multinational software companies as against the local companies. It is also an indication that foreign software will continue to dominate the Nigerian market unless there is holistic government policies and enforceable regulations to tide the flow of foreign software into the country and at the same time strengthen the capacity and capabilities of the local software industry.

In the Meantime, it is uneconomical for the local software companies to declare that they can domestically engage the multinational ICT companies in competition for the provision of efficient and cost effective software products.

#### **Local content a tool for the promotion of local software development**

By definition local content is an expression and communication of a community's locally generated, owned and adapted knowledge and experience that is relevant to the community's situation (Khan). Local content is a work which is produced under the creative control of nationals of the country (Bhattacharjee, 2001) and it is that proportion of input which comes from the country itself, as opposed to those imported.

Local content is an economic tool which is employed to create local capacity and capabilities that can compete with foreign companies and in the process develop the economy of a nation (Ayonmike, 2015). It is a policy designed to protect local technology and services from unfair foreign competition as a result of globalization, thereby preserving the value of local technology and services within the borders of a country. Local content involves value addition, by maximising the industrial and other connected values that can be made to a country's natural resources for its overall economic benefits.

With the growing pressure of globalization, every government as well as captains of industry are charged with the burden of finding ways to ensure that their regions stay competitive and are capable of fulfilling local demand. It is imperative that right frameworks are created to enhance the ability of indigenous companies to maximally explore and exploit local opportunities, as well remain competitively.

For the Information and Communication Technology (ICT) sector in Nigeria to develop and level up with leading ICT nations of the world, concerted efforts have to be made towards developing some amount of local contents both in the software and hardware components of ICT infrastructure

Nigeria can reduce its despondency on foreign software products and services by embracing the local content initiative as a facilitator to the growth and development of local ICT industry.

The implementation of the local content requirement must start with the mobilization and nurturing of local capacities and capabilities in ICT and its associated products. Nigeria with her size and abundant supply of low cost software engineers or graduates, majority of whom are self-taught, the country stands a good chance of supplying highly skilled and talented professionals to work in the implementation of local content requirements.

Apart from developing the local software industry, local content can enhanced the relationship gap between academics and the software companies, thereby reducing the industry's skill gap with relevant IT professionals

The relevance of local content has been recognized that in some instances where local software applications are in use, they are built into the architecture of the foreign solution as one of several modules (ATCON, 2008). To this end, building of local content requirement into the ICT policies of the country will have a great potential for success whenever it is adopted.

#### **Importance of Local Content to the Development of Nigerian Software Industry**

Local content is advantageous to the development of indigenous software in Nigeria. With the volume of ICT consumption in the country, Nigeria stands to benefit economically in a big way with the infusion of local content into the IT industry. However, despite the high number of ICT professionals in Nigeria, until recently, adequate attention has not been given to the issue of developing and building local contents.

For instance, Nigeria being the 11<sup>th</sup> highest users of internet, with most of the information being browsed and downloaded comes from centres located in the western countries with no Nigerian contribution. Nigerian IT developers can take the initiative of developing internet data centres that can provide information on exclusively Nigerian information at the finger tips of internet browsers within a very short time. This will reduce the time spent on the internet and increase the speed of accessing internet documents instead of looping the request to the international data centres before it can be accessed by the end-users.

Furthermore, most of the information obtained from the internet is not contained in the local languages. Nigerian IT developers can utilized this opportunity to develop internet data centers that can provide information in local languages, thereby, spurring the interest of rural dwellers to start using the internet.

#### **Areas of Local Content Infusion In Software Development**

##### **Local Content in Business Sectors**

It is apparent to see that in Nigeria today many business operations ranging from commerce, marketing, retailing, industry, banking etc are run using sophisticated software that are developed by foreign software vendors. Nigerian economy, which operates on the banking institution is controlled and simplified through computerized system of software. Unfortunately majority of the software used in the

operations are produced in languages that are not understood by a large population of the citizenry especially those dwelling in rural areas.

Against this backdrop, there is the need for IT industry and the Nigerian government to examine the situation critically with a view of developing a strategy and possibly policies in this area that would compel the involvement or inclusion of local input into the software that are produce to run these business operations. Such involvement could be by introducing custom made software for the banking operations that are tailor made to suit Nigerian local languages and that are user friendly.

In the area of commerce, now that Nigeria is moving towards a cashless society, the transaction of local businesses also requires computers and computer software. Local software developers can therefore prevail on this opportunity as a local content strategy to develop locally made software(s) that can serve the Nigerian terrain and are language specifics.

### **ICT Local Content in Telecommunication**

Nigeria is a heavy consumer of telecommunication services and recent survey has shown that Nigerian active GSM subscribers hit 146 million. This means that there are a total of atleast 146million handsets actively operated in Nigeria. Considering that each hand set cost averagely \$27, it means the industry for the manufacture of hand set is a **\$3.942 billion** industry. The daily consumption of recharge card if on the average every subscriber is to consume \$0.28 recharge card will amount to \$41million daily and annually it will amount to **\$14.965billion**

However, it is lamentable to know that apart from the payment of taxes made to the government by the GSM operators Nigeria is not a stakeholder in the GSM industry. This is because the hand sets being used by subscribers in Nigeria are wholly imported including the battery to run the system and the software used to operate the device are all developed by foreign software developers. It is a high time that the Nigerian software industry wakes up to the opportunity that exist in the telecommunication sector and quickly device a strategy to benefit positively from by using the local content initiative to make an impact.

### **Local Content in Education**

According to the data contained in the website of the Nigerian University Commission (NUC) Nigeria can boast of 165 (Funmilola, 2018) universities made up of 43 federal universities, 47 state universities and 75 privately owned universities. In addition Nigeria has about 288 (NBTE, 2018) about technical schools made up of Polytechnics, Monotechnics, Colleges of Agriculture, Colleges of Health Technology and Vocational Education Institute (mostly offering Computer science and Computer Engineering courses). Additionally Nigeria has 63(4) colleges of education both federal state and private. And it is estimated that well over 1million students are registered with over 200 institutions in Nigeria. If on the average each student is to possess a computer be it laptop, palmtop or desktop it will on average be 1million computer. The industry that

manufacture computer for educational institution in Nigeria will have to cope with this huge number of hardware.

This estimate is only for the hardware alone. Imagine if the Nigerian local software industry is to develop an e-learning, e-library software as a contribution to the local content debate the amount will translate into a quantum number of software to be developed for the students learning process. This is in addition to the software on administration of these institutions such as software on staff data, salary, planning, teaching etc. Suppose for the simplification of knowledge, the Nigerian software industry, for the sake of local content, ventures into the production of e-learning software that are in local languages. This again, will translate to huge financial costs and in monetary term this is a multi-billion Naira industry. Investigation reveals that larger percentages of Nigeria population leaves in rural areas and can only communicate in their local languages. Software can facilitates communication with this people in their mother tongues (Yekini, 2012).

This analysis is for tertiary higher institutions alone. If the analysis is extended to be extended to cover educational areas at the lower educational levels like the primary and secondary schools, where figures from an independent census carried out in 2006 shows that Nigerian have 54,434 primary schools with an enrollment of 24,422,918 pupils and 7,129 junior secondary schools with an enrollment of 3,266,780 pupils. Although other studies have revealed conflicting figures that are higher however, whatever may be the exact figure, the fact is that the number of primary schools in Nigeria is very high. This represents a large sector in terms of the viability of software local content. It terms of opportunity for local content penetration, the sector has a huge potential. Software local content that can be develop for the sector could range from software to management of primary and secondary education in the area of planning, organization, directing, staffing, enrollment, coordinating, budgetary, salary, curricula management and development, teaching tools, and so on.

### **Local Content in the Energy Sector**

Government has enacted an Act called the Nigerian Oil and Gas Content Development Act (hereinafter referred to as the "Act") promulgated on the 22<sup>nd</sup> of April, 2010. The Act provided, amongst others, that the holder of an oil mining lease must within 10 years from the grant have employed at least 75% Nigerians in managerial, professional and supervisory grades. The Act can be extended to cover other areas of the operations of the sector as the IT requirement of the sector. It is on notice that the sector is heavy consumer of IT products highly needed for the running of its upstream and downstream operations. At the present most of the software deployed by the sector are purchased from licensors abroad and if Nigerian software policy could extend the local content requirement to include the utilization of local IT products, lots of benefit would be accrued from the reduction in funds used to purchase foreign software, thereby encouraging and empowering local software companies to develop.



### **Software Local Content in Preservation of National Heritage**

Nigeria is a country a vast with more than 250 ethnic groups' affiliations and tribes recognised from its culture, tradition and religious believes. These cultural treasures are valuable assets for the country, which can be documented and preserve for the generation upon generation yet to come. It can also be a source of information to be made available for the tourist industry.

Hence, the Nigerian IT industry as part of the local content drive can invest into the area of documenting and preservation of this diverse cultural heritage available in the country by developing local software that can store and preserve this information.

### **The Role of NOTAP in Local Content Development**

As part of the statutory function of NOTAP in the registration of all technology transfer contract or agreement between Nigerian parties and foreign counterparts, the Office has over the years since creation received hundredth of such agreements from various sectors of the economy. One of the sectors that have been visible in recent years is the ICT sector.

The sector has witnessed large consumption of foreign software products especially by the financial institutions and the telecommunication sector. Most of these software products comes from multinational ICT companies, such as Microsoft (USA), Finacle (India), SAP (Germany), Flexcube (India), Oracle (USA), IBM (USA), Reuters (USA), etc. This has resulted in huge outflow of foreign exchange for the payment of products purchased and other software services from the Licensors abroad.

Analysis of foreign software consumption form available record obtained from NOTAP has shown that in the last five years alone a total of US\$188.7million or N67.93billion has left Nigeria as payment to the Licensors for software agreements registered by NOTAP. This is a big financial burden to the economy of Nigeria in terms of both payment that are genuine and those that are done to aid capital flight.

Nigeria, in particular, has put humongous investments into the consumption of software products & services with almost nothing being said or done about tapping and sustainably developing our local contents, capacities and capabilities for export (Ayodeji, 2015).

As a technology regulatory office, NOTAP has evolved many initiative aimed at encouraging the domestication of foreign software applications being imported into the country. One of the initiatives is the local vendor requirement.

Under the local vendor requirement all foreign software license agreement that contain annual technical support (ATS) submitted for registration is required to appoint a local vendor to participate in the implementation of at least 40% of the ATS and should be paid fee that commensurate with the percentage of support offered.

Other initiatives undertaken by NOTAP include organising workshops on Software Licensing and Development in

Nigeria with all relevant stakeholders both in the public and private organisations, end-users and multinational software companies. NOTAP also organises national exhibition of locally developed software with all the local software developers in the country. The major thrust of this program is to explore avenues for the sensitization, promotion, and patronization of made in Nigeria software products.

These programs are aimed at building the capacity of local software developers with the overall objective of replacing and or reducing the consumption of foreign software products in the country and its effects on capital flight.

In the area of synergy in 2015 NOTAP entered into a collaborative partnership with the National Information Technology Development Agency (NITDA). The partnership is to explore all available strategy for the implementation of the national strategy on local content development, and to forge a mutual regulatory alliance in the consolidation of activities for the development of the IT sector.

### **3. Conclusion**

This study reveals that Nigeria is one of Africa's busiest ICT market as a result of her heavy trading, importation and consumption of ICT enabled tools, technologies and other related software products. As a result of the heavy consumption of foreign software, huge amount of foreign exchange is spent on the payment of software license fees and services to software technology providers abroad. In turn, the local software developers are left underdeveloped and without the necessary pre- requisite knowledge, skills and facilities to operate at the same level with their foreign counterparts.

Couple with that, the investigation also observed that the flight of the Nigerian software developers is exacerbated by the low patronage of their products by the local end-users, who prefer foreign software at the expense of the local ones. These trends together with the absence of enough government support, motivation and encouragement contributed to the decline in the growth of the ICT industry, thereby, making the country to lose the opportunity of taking up position in the global ICT value chain.

The analysis propose that if Nigeria is move out of the nations in the digital divide then, it must introduce enabling and enforceable policies and capacity building in the implementation of her ICT agenda. Such policies may be in the area of local content requirement, which if properly harnessed will go a long way in mitigating the over-dependence in the consumption of foreign software. This policy have all the ingredient of success as the nation is already blessed with abundant intellectual capital whose genius and creativity in software development could assist in jump starting Nigeria to participate in the booming global software industry.

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