



Datacentre Infrastructure insight and market forecast, Nigeria

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Executive summary

In 2017, expenditure on IT (hardware, software and services) in Nigeria was about \$1.19 billion and is expected to grow to \$1.58 in 2021 at compound annual growth rate (CAGR) of 7.3%. The ICT landscape is still in the infrastructure-build phase with significant investments in hardware and software, services market is gradually gaining traction though from a low base.

Generally, there is growth in the use of ICT as consumers and businesses leverage technology to address daily needs of communication, entertainment, education, financial transactions etc. For individuals, ICT usage continues to gain traction with availability of low-cost high-speed broadband services, while businesses too continue to leverage robust connectivity services to communicate internally, interface with customers and access enterprise applications or services that allow more business efficiency, operating cost reduction and profitability.

Datacenter is one of the critical ICT infrastructure that drives growth in IT spend and has attracted both local and international investments in Nigeria. However, the high cost of constructing and maintaining a datacenter has limited its ownership to companies in verticals like Telecoms and IT, banking and financial services (BFSI), Oil & Gas and public sector. Other verticals are also investing in "datacenter", albeit they can simply be classed as server rooms.

In 2017, datacenter spend on hardware accounted for about 61% of total IT hardware spend also in the same year, investments in infrastructure software accounted for about 48% of total IT software spend. In 2017, total datacenter IT spend was about \$184.6 million i.e., servers \$20.3 million, storage \$18.4 million, networking equipment \$34.6 million and infrastructure software \$111.3 million. Leading IT vendors for storage technologies are Dell, NetApp and Huawei. Leading IT vendors for server infrastructure are IBM, Inspur and HPE. HP is a market leader when it comes to x86 servers, while IBM is the preferred OEM for non-x86 servers. Leading IT vendors for networking equipment are Cisco, Juniper and Huawei.

Now in Nigeria, several factors such as the requirement for business efficiency and cost control, maturing telecoms and innovative banking sector, government reform etc have all been drivers for investment in datacenter, while poor connectivity, lack of steady power supply, low availability of IT skill set, high cost of foreign exchange are top inhibitors to investments. In the short to medium term, we expect continued investment into datacenter infrastructure, although at a slower rate than previous years. Investments will mainly ride on waves of infrastructure expansion and refresh cycles.

Synopsis

This report is a refresh on an initial publication in 2016 which focused on data center infrastructure market in Nigeria. The insights in this report highlight datacenter trends in the country, drivers and inhibitors to investments and general adoption trends by enterprises across verticals. The report is an expose on the current state of the data center infrastructure and concludes by predicting future market trends based on user behavior and market forces.

Datacenter market overview

Businesses across all verticals have datacenter prototypes leveraged for IT services, however proper investment in datacenter infrastructure has been led by the government and private sector in telecoms & IT, BFSI and Oil & Gas

Gradually, more businesses are investing in IT infrastructure and solutions to implement digital transformation strategies and leverage opportunities in the growing digital economy. The increasing subscriber base in the telecommunications industry, central bank regulations in the banking industry, the increased need for cyber security in the Oil & Gas industry and the increasing need for storage in the entertainment and pay TV industry all positions Nigeria as a key investment center for datacenter infrastructure

Regulatory reforms in the BFSI vertical is forcing compliance to upgrade operations from server room type environments to standard certified Tier III datacenter facilities to support improved business processes, efficiency and increase agility. It cannot be over emphasized that regulatory oversight and policies in the BFSI vertical has had significant impact in the growth of datacenter in the vertical and if investments will be made across other verticals, regulatory reforms will be a key driver. For example, now there is no policies regarding data sovereignty, regulation or legislation by the government enforcing this as a requirement is expected to drive growth in data center capacity in Nigeria

Hosted infrastructure services which includes colocation, dedicated and shared hosting, managed infrastructure services, managed services, business continuity & disaster recovery (BC/DR) and cloud services are the main datacenter services in the country. Although as cloud computing is nascent in the country it is expected to be a long-term driver for datacenter investments especially as businesses are forced to strategical migrate from a capital expenditure (CAPEX) model of operation to operational expenditure (OPEX) because of profitability concerns amidst strong competition. Now most cloud providers are investing to create awareness and gain mindshare in readiness for when the market will enter its growth phase.

Public cloud market size in Nigeria for 2017 is about \$7.67m. Software as a Service (SaaS) accounts for about 87% of public cloud revenue in Nigeria because of the low level of IT market maturity and connectivity infrastructure challenges. ERP as a service, CRM as a service and collaboration as a service all account for a significant portion of SaaS revenue in Nigeria. PaaS and IaaS services are also very nascent; however, adoption of these services is expected to gain traction as the market matures and connectivity improves. Backup as a service and Server as a service are the key IaaS services adopted in Nigeria.

In Nigeria, most CIOs and IT business managers especially of large and multinational businesses still prefer on-premise solutions, although there is slow culture shift to operate hybrid cloud deployments driven by the cost of maintaining in-house hardware. In hybrid cloud deployment models, mission critical workloads are kept in-house and non-mission critical data are migrated to public cloud.

The major challenge with cloud adoption in the country is the profound concern on cloud security, organizations are weary of hacking and illegal access to company data. These negative biases have been further fueled by global trend in cyber terrorism; which businesses and governments in developed nations have been victims, hence Nigerian CIOs are concerned about the security capabilities of local cloud service providers.

In 2017, total datacenter IT spend was about \$184.6 million i.e., servers \$20.3 million, storage \$18.4 million, networking equipment \$34.6 million and infrastructure software \$111.3 million. Leading IT vendors for storage technologies are Dell, NetApp and Huawei. Leading IT vendors for server infrastructure are IBM, Inspur and HP. HP is a market leader when it comes to x86 servers, while IBM is the preferred OEM for non-x86 servers. Leading IT vendors for networking equipment are Cisco, Juniper and Huawei.

IT Infrastructures made simple

Datacenter Market Trends in Nigeria

Datacenter availability and Trends

Datacenter availability is relatively high in Nigeria at least for its level of IT maturity, most datacenter infrastructure reside in Lagos and Abuja; the commercial capital and political capital of the country respectively. Some datacenter and disaster recovery infrastructure are also strategically located in other cities e.g. MainOne's second datacenter is in Shagamu, Ogun state and Galaxy backbone's DR is in Enugu state.

Availability of Uptime institute certified Tier III datacenter is high in the country. Banks have been forced to upgrade to their infrastructure to match Tier III standards, although only about 5 from 25 banks have fully complied with the regulation; which explains the frequent services outages and unplanned downtimes suffered in the sector which negatively impacts operations and customer confidence in using non-traditional banking services like automated teller machines, mobile or internet banking etc. However, the other 20 banks position the industry as

needing datacenter investment to maintain a minimum level of service requirements and regulation.

Telcos in Nigeria i.e. MTN, Airtel, Globacom and 9mobile all have at least one data center in Lagos or Abuja, mostly for internal use to support growing customer base and increase agility in launching new services. MTN is the only telco in the country with a fully commercial Tier III data center.

Internet service providers (ISPs) and IT services providers have also invested in Tier III infrastructure to position as local 3rd party datacenter and cloud services providers. In fact, providers like MainOne and Rack center have recently invested in capacity expansion driven by increase in demand for especially colocation services. MainOne recently expanded from 300 to 600 racks, while Rackcenter expanded from 255 to 530 racks.

21st Century, an ISP is currently investing in the first-Tier IV datacenter facility in West Africa, construction is ongoing in the Apapa area of Lagos state. Going to market as the premier Tier IV datacenter infrastructure provider is strategic to gaining first mover advantage, launch unique marketing campaigns and offer higher levels of IT performance, reliability and availability compared to Tier III datacenter providers in the country. The ISP's long-term strategy is to invest in four more Tier IV facilities across key business districts of Lagos state i.e. Maryland, Ikeja, Surulere and Lekki.

Adoption of converged systems is yet to gain ground, although in the long term we expect a gradual migration from traditional silos to converged infrastructure. Moreover, initial investments to migrate legacy systems to converged systems, including the skills set required for such migration are inhibitors. A high percentage of datacenters in Nigeria deploy HVAC cooling systems, but chiller systems are not widely implemented, basically due to cost constraints. Therefore, chiller systems have been mostly deployed by 3rd party datacenter providers that have the budget to fund such implementation.

Traditional vs Prefabricated/Modular Data center

Prefabricated/Modular Data center solutions are yet to gain traction in Nigeria because there is a general preference for the traditional brick and mortar data center construction by most enterprises. Rackcenter is the most notable provider that has deployed prefabricated/modular datacenter infrastructure. Vendors like Huawei and IBM have recently tried to exploit the market potential of prefabricated/modular data center solutions, but acceptability and adoption is still low. A major inhibitor is the lack of aggressive marketing and lack of competitive value proposition to support sales pitches. Another key inhibitor has been the availability of about six Tier III datacenter service providers, that provide a wide range of datacenter and cloud services. Therefore, due to economies of scale and potential cost savings,

enterprises outsource their IT infrastructure to these providers instead of investing in owning a datacenter facility.

Private cloud vs Public cloud

Generally, cloud technology is nascent in Nigeria, however we expect growth in adoption as last mile connectivity improves and successful case studies of its cost saving benefits increases. Increased penetration of FTTx services in key cities like Lagos and Abuja will drive adoption of cloud services especially among large enterprises.

In Nigeria, private cloud deployments are mostly implemented in environments where data needs to be accessed by different departments/line of business or from different locations, mostly in the BSFI, telecoms and Oil & Gas vertical. Although private cloud requires greater financial investment; latency, easier access to data, scalability and flexibility to business and IT processes as well as high IT budget availability drive such implementations. Another driver of private cloud implementation is the security concerns over company data. Organizations prefer to host most mission critical applications and workloads e.g. ERP and CRM, finance applications within their own datacenter environment, while non-transactional workloads are hosted within 3rd party datacenter.

'As-A-Service' modes

Software as a service (SaaS) leads public cloud adoption in Nigeria as organizations leverage the technology to cut cost on productivity tools and non-critical workloads. Platform as a service (PaaS) and Infrastructure as a service (IaaS) are yet to gain ground in the country due to challenges related to low customer maturity, connectivity, latency concerns and high pricing.

Datacenter certifications

A major datacenter trend in Nigeria driven by 3rd party providers is the level of datacenter certification acquired from especially the Uptime Institute - Tier III Constructed Facility certification (TCCF), PCI-DSS certification, the Business Continuity Management Certification etc. It is worthy of note that there is currently no Tier III operationally certified datacenters in the country. Multiple certifications are pursued to gain competitive edge and used as critical go to market campaign to showcase adherence to international best practices on high availability, security and protection of data.

Datacenter Market Drivers and Inhibitors

Drivers

Maturing telecoms market

The Nigerian telecommunications and IT markets are the most matured in West Africa and among the most matured in Africa both in consumer and enterprise segments. Liberalization of the sector broke government monopoly and drove immense growth in the sector, the country now has over 162 million mobile voice and about 106 million mobile data subscribers across four mobile network operators i.e. MTN, Globacom, Airtel and 9mobile. The availability of improved mobile broadband networks i.e. 3G and 4G has provided opportunities to offer digital services that has consequently driven market maturity. Subscribers can leverage OTT applications for communication, entertainment and business transactions. Increased usage of telecoms services both voice and data has driven the requirement for more datacenter services in the country. The Nigerian telecoms which is valued at about \$7.8 billion in 2017 is a leading investor in datacenter infrastructure. Service providers like MTN, MainOne, Rackcenter, Internet Solutions etc have all invested in Tier III datacenters. Cutthroat competition in the sector especially in the enterprise segment has driven the requirement for differentiation, hence recent adoption of software define networks in datacenter environments

Innovative banking sector

Another sector leading investment in datacenters in the country is the banking and financial services sector. All 25 major banks in the country are key investors in datacenter infrastructure. Unlike the telecoms sector whose datacenter investments are driven by market competition, in the BFSI vertical, investments in datacenters have gained traction due to strong regulatory reforms implemented by the central bank of Nigeria (CBN). Nigerian banks are required to possess in country disaster recovery sites and also upgrade datacenter facilities to Tier III. This has driven construction of new datacenters, mostly located in Lagos. Security concerns over sensitive data has driven in house investments in disaster recovery sites rather than hosting with 3rd party providers.

Generally, refresh cycle for servers in the sector is between two and half years and three years

Another reason the BFSI sector has been a key investor in data center infrastructure is to support delivery of innovative banking services. There has been growth in mobile and internet banking solutions as banks compete to retain and attract customers. 24/7 availability and seamless implementation of mobile, e-banking and e-payment solutions have placed increased demand on IT infrastructure of banks, hence proportional investment in datacenters.

Business efficiency and cost optimization

Cloud adoption is a driver for datacenter infrastructure investment in Nigeria. The cloud market in Nigeria for 2017 is valued at about \$7.69 million. Software as a service accounts for about 87% of the market. Although the market is still at infancy, cloud services are gradually gaining traction in Nigeria. Recent economic recession experienced in the country has triggered emphasis on business efficiency and cost optimization initiatives, hence cloud computing has been identified as an enabling technology to grow profitability through cost reduction. Across sectors like manufacturing, FMCG, e-commerce etc there is a gradual migration of workloads mostly non-critical workloads like emails to cloud environments to cut capex investment to on-premise IT infrastructure. Cloud implementation of enterprise software like customer relationship management [CRM], point of sale (POS) solutions, ERPs are gaining traction and driving investments in datacenter infrastructure software. Particularly in the telco connectivity market, a new trend of leveraging datacenters for cost optimization is through software defined wide area networks to offer seamless and agile IP-VPN solutions.

Business intelligence and data analytics

Increased competition across all sectors of the economy especially FMCG, telecoms, banking and financial services and retail has driven the need to gain more insight about who has been a customer, who is the customer and who is a potential customer. Management of organizations want to understand how to increase their companies share of wallet of a customer through upselling and cross selling, while also seeking opportunities to make fresh sales to potential customers. This strategic direction by most companies has driven growth in business intelligence and consumer analytics. The volume of consumer data generated by service providers across all customer touch points continues to increase, forcing increased requirement for safe and reliable storage solutions. Business intelligence and data analytics have been and will continue to be drivers for datacenter investments in Nigeria.

Inhibitors

High cost of foreign exchange

A significant percentage of IT hardware and software deployed in the country is imported. Nigeria like most African countries is yet to develop capabilities to be self-sufficient in the local production of IT hardware and software, therefore, there is heavy reliance on international original equipment manufacturers (OEMs) for its ICT procurements. Recent decline in global oil prices that saw the country slump into economic recession negatively impacted the Nigeria currency; Naira and eventually forced further devaluation by the government. Consequently, financial capabilities of organizations to execute IT projects both at private sector and public sector was negatively impacted. The high cost of foreign exchange has limited standard datacenter construction to few verticals with financial capabilities to execute such capital-intensive projects.

Connectivity concerns

Consistent lack of capability to offer seamless connectivity on mobile and fixed broadband networks in Nigeria is a major inhibitor to cloud adoption and by consequence limited local 3rd party data center capacity in the country. Connectivity service providers struggle to deliver on service level agreements because of two main challenges i.e. erratic power supply and telecoms infrastructure vandalization. Heavy reliance of diesel generators due to prolonged lack of public power exposes service providers to risk of power failure and in some cases extensive downtimes especially in remote locations. Service providers are forced to make significant capital and operational investments to maintain power for network availability, which unfortunately sometimes is not enough. Secondly, there is consistent vandalization of fiber cables across the country by construction contractors. During road construction, fiber cables are consistently vandalized due to lack of proper planning of city infrastructure projects as most cities lack blue print for development. Consequently, most governments in executing their infrastructure programs destroy already laid cables which has dire ripple effect for both telecom service providers and their customers

Low literacy and ICT maturity

Although Nigeria is one of the most populous nations in the world, general ICT literacy and maturity is low, IT skill set, and services is limited to few cities in the country i.e. Lagos, Abuja and Port Harcourt. The demand for advanced IT services by business is mostly limited to these cities, hence they lead the rest of the country in terms of datacenter infrastructure investment and development, especially Lagos. Lagos used to be the capital city of Nigeria, that effect and its proximity to the Atlantic Ocean has made it grow into the commercial nerve center of West Africa. Most multinational businesses have their headquarters domiciled in Lagos, therefore these factors have driven higher development of ICT in the city compared to the rest of the country. Lack or low IT services requirements by businesses across the country especially SMEs has not justified business case for investment in expensive IT infrastructure like datacenter in other parts of Nigeria

Future Datacenter trends in Nigeria

The Nigeria government through its telecommunications and IT regulatory bodies i.e. Nigerian communications commission (NCC) and National Information & Technology Development Agency (NITDA) respectively is striving to ensure growth and development in the ICT space across the country. In fact, one of the cardinal agendas for the current administration led by President Buhari is to lead a diversification initiative from economic dependence on oil revenues to a serviced based economy driven by nationwide ICT adoption. So far it has been a slow process, however the government is taking steps in the right direction to ensure its agenda comes to fruition through creating and implementing policies both in the connectivity and IT space, for example NITDA has implemented policies aimed at curbing capital

flights abroad to leading multinational datacenter and cloud providers like Amazon and Microsoft. The policies are targeted at driving growth in the local datacenter market by enforcing that all government ministries, departments and agencies host their websites locally. The CBN reform requiring all banks to upgrade to Tier III datacenter infrastructure has already had positive impact in local datacenter construction and usage. Policy by the ministry of communication to increase nationwide broadband penetration is also expected to boost connectivity services around the country, which will be a catalyst to drive IT maturity.

However, we also anticipate government bureaucracy, lack of collaboration and accountability by government entities will be a deterrent to implementation of these policies, therefore a public-private partnership (PPP) model in planning and implementation is expected to drive the needed growth in ICT investment especially in datacenters in the country.

Furthermore, in the private sector, we expect telecoms & IT, BFSI and Oil & Gas verticals to continue leading datacenter projects. Other verticals like education, FMCG, retail and wholesale, hospitality, health care, entertainment etc will partner with 3rd party datacenter providers especially for colocation services. We expect that the trend of cutting cost on all business expenditure including IT, will force CIOs to outsource more IT services to datacenter and cloud providers.

Also, as the fixed connectivity market matures, we expect an increase in deployments of software defined network (SDN) technologies in datacenter environments, such as SD-WAN especially by telcos, ISPs and IT service providers. Cut throat competition among fixed data connectivity providers will drive the requirement for network programmability, agility, and automation to deliver excellent quality of service, backed by competitive service level agreements. We expect business requirement to accelerate launch of new services especially in the banking, insurance, FMCG and ecommerce sectors will also drive more implementations of software defined network (SDN) technologies in datacenter environments.

Although, now, there is sizable deployments of standalone datacenter infrastructure such as compute, storage and networks in silos, we expect in the long term as cost optimization becomes a default theme in board rooms across the country, CIOs will be forced to embrace advanced datacenter implementation such as converged and hyper converged systems. In the long term we expect growth in implementations of high-performance and scalable datacenter infrastructure in Nigeria

Conclusion

The potential in the Nigerian IT industry cannot be overemphasized, however it will take gradual and consistent effort both from private sector and government to consolidate on past achievements and progressively turn potential to tangible opportunities. The ability of the government to also create investor friendly environment to attract foreign direct investment (FDI) into the IT space will be critical to long term growth of datacenter infrastructure in the country.

Although IT market maturity is relatively low compared to markets in Europe and America, government policy and demand side's confidence in advanced datacenter services are expected to create more datacenter expansion opportunities. It is imperative that 3rd party datacenter providers continue to invest in building capabilities that match international best practices. It will be challenging for businesses across all verticals to embark on datacenter construction projects simply because of financial constraints and the lack of internal IT expertise to maintain the infrastructure especially the SMEs. Therefore, increased confidence in the capabilities of local 3rd party players to offer affordable and reliable basic services like colocation, web hosting, business continuity and disaster recovery etc will be drivers for demand of datacenter services; which consequently will drive optimization of current datacenter capacity and medium to long term expansion.

However, refresh cycles in key verticals like telecoms, BFSI and Oil & Gas will still offer major opportunities for datacenter investment in the country. Cisco, HP, Huawei, Dell EMC, NetApp, IBM etc will continue to be leading datacenter OEMs in the country as they have become trusted brands, have in-country offices and have been able to create relationships with key clients across all verticals. Players in the power & energy ecosystem that seize the first mover advantage in offering cost effective and innovative green energy solutions will be well positioned for partnerships with datacenter providers. With margins fast eroding in the telecom sector, opportunities to leverage IT across all verticals and in government is expected to lead the new wave of ICT revolution in Nigeria, with datacenters playing a lead role in service implementation

3rd party datacenter providers should focus on selling solutions not certifications or tier levels. CIOs are more concerned about how datacenter services can help grow their businesses than datacenter certifications. Acquiring data certifications may be effective for creating brand awareness and pursuing global best practices, however during marketing to CIOs focus must be on how the datacenter and cloud services can support businesses to reduce cost and increase profitability

Appendix 1: Methodology

This report was developed by drawing on the existing local and international research from Above Zero Limited. The report was also written using secondary information obtained from online sources, including websites of news channels, technology vendors, IT magazines and international authorities and primary research insights from leading CIOs across verticals in Nigeria i.e. (BFSI, telecoms and IT, Oil & Gas, FMCG, government, education and health. The report aims at giving a complete view of the datacenter infrastructure landscape in Nigeria.

Appendix 2: Abbreviations

Automated Teller Machine: ATM

Banking, Financial services and Insurance: BFSI

Business Continuity/Disaster Recovery: BC/DR

Capital Expenditure: CAPEX

Central Bank of Nigeria: CBN

Chief Information Officer: CIO

Compound Annual Growth Rate: CAGR

Fast Moving Consumer Goods: FMCG

Fiber to the (Home, Office, etc.): FTTx

Information Technologies: IT

Information and Communications Technologies: ICT

Infrastructure as a service: IaaS

Internet Service Provider: ISP

Machine to Machine: M2M

Mobile Network Operators: MNO

Nigerian Communication Commission: NCC

Operational Expenditure: OPEX

Original Equipment Manufacturer: OEM

Point of Sale: POS

Platform as a service: PaaS