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THE EFFECT OF NOISE ON TRANSMISSION QUALITY IN OPTICAL FIBRE SUBMARINE COMMUNICATION LINK. (CASE STUDY OF YZERFONTEIN TO LEKKI)

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ABSTRACT

The telecommunication industry has recorded lots of break-through in recent time due to bandwidth explosion, especially in optical fibre submarine communication. Due to its higher information carriage capacity, most network providers are embracing it for efficiency, higher Quality of Service (QoS), and a broader carriage capacity. Amidst the successes achieved through the establishment of this medium, there are lots of challenges facing the system which includes: High cost of installation and maintenance and electronic noise. In this work, the link was investigated, taking a case study of one of the Networks from Yzerfontein in southern Africa to Lekki, Lagos by a service provider .It has been discovered that most of the repeaters/amplifiers in the network are not receiving signal at the acceptable range of ±1.5 vendor's specification. This implies that more noise is added to the amplified signal which consequently affects the quality of transmission. The data was collected by connecting an RS232 cable at the F interface of the 1660 SM NE (PFE) to the 1320 CT, Craft Terminal proposed for the Q3 Network Elements which is a standardized network management interface, according to ITU-T recommendations. This research has been able to quantify the cumulative noise figure of the received signals of the various repeaters whose values are above the stated range based on the acquired data.

Key words: Amplifier/Repeaters, Optical-fibre, Q-factors, Signal to Noise Ratio (SNR), Submarine.

I INTRODUCTION

Over the years, there has been a need to enhance or optimize the quality of communication signal, hence the transition from cable, radio, satellite to Optical fibre (terrestrial and most importantly submarine) communication media. The various media in their capacities served or are still serving their purpose. The later, optical fibre submarine communication system evolved in the quest for high carriage capacity for both voice and data. This medium was established to satisfy the customers' desire for more effective, low cost and accessibility of the system. Here is a list of parameters that was considered systematically to design this medium:

Cities connected by the links: The geographic make up gives the basis for defining transmission distances and the geophysical characteristics required for installation work.

Use of existing structures: Some systems with increased transmission capabilities are installed on existing cables (to reduce civil engineering costs). This additional constraint is important when provisioning the future link.

System capacity: The total information rate transmitted between the different points of the link is duly considered.

Transmission quality: This parameter defines the tolerable error limit of the system (one error represents receiving a 1 for a 0 or vice versa). The quality of transmission of the link is expressed as a bit error rate (BER) or as a transmission quality Q-factor (where Q is expressed in dB). Those characteristics depend on the type of signals to be transmitted (voice, data). Current systems are defined for data transmission. A bit error rate less than e-13 is required according to the G.826 recommendation.

Lifetime: The lifetime of a link is generally more than 25 years. Often equipment becomes obsolete long before reaching this limit (transmission rate, etc). One of the most fascinating thing about submarine communication is the network of the parameters which constitute the system [1]. The role of the repeaters in the submarine optical fibre network systems is very vital as they are placed at specific and constant distances to amplify the weak received signal. It is well known that attenuation increases with increase in distance. So, as the optical signal travel down the fibre cable, it reduces in strength but the repeaters amplify the weak signal as it passes through it. This research is focused on the quality of the signal transmitted (Q-Factor) though, to effectively discourse and investigate this, the architecture of the link is elaborately emphasized and some parameters like signal-noise-ratio (SNR) has been investigated also to gain precision.

1.1 Optical Fibre submarine Communication Systems

The sea environment brings about the peculiarity of the submarine systems as it creates the requirements before and during the links operational life. A submarine cable system is often submerged at great depths, hence cable and equipment must be fabricated to withstand extreme pressures, be hermetic to water ingress and completely isolated electrically from sea water, as well as feature high degrees of reliability because repair operations at sea are inconvenient in terms of cost and maintenance [2]. Installing or repairing of submarine cable system requires highly specialized and experienced personnel and ships. Submarine cables must feature a very strong mechanical resistance, against traction and abrasion [3] – which is provided by armoring and are often buried under the seabed to protect them from trawlers or anchors in areas where there are naval activity.

For instance, submerged repeaters and branching units are designed using the latest technology, such as lasers, optical amplification and wavelength-division multiplexers, with a target of 25 years

of reliable operation [4]. Terminal station equipment includes the best from terrestrial systems, plus specially designed transmission equipment that allows transmission distances over 12000 km on an optical fibre without regeneration. In addition, terminal stations increasingly include very state-of-the-art computers and software to enable real-time monitoring of the behavior and performance of whole submarine network.

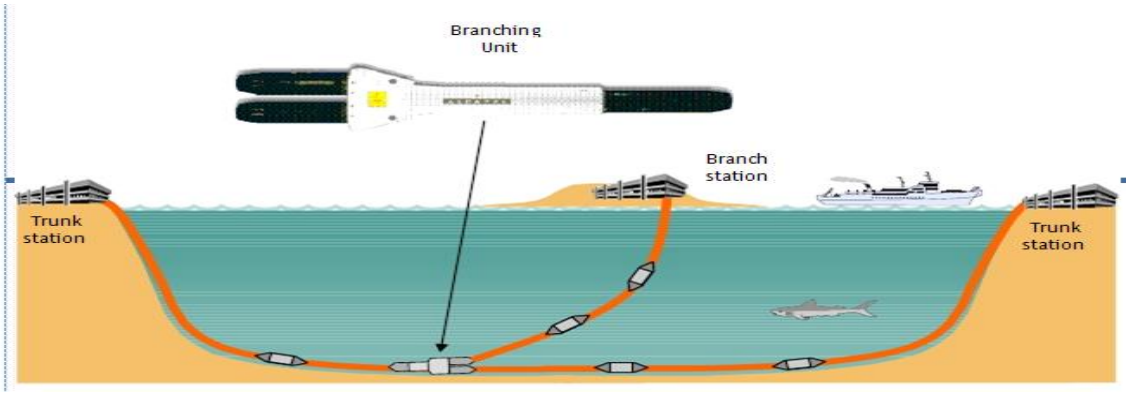


Figure 1: A typical optical submarine network [2].

Branching Unit (BU): Based on the architecture of the submarine network, is often necessary to branch off some of the traffic (and therefore the fibres) to an intermediate station. This splitting of the cable is performed by a branching unit (BU) which provides the various fibre connections and routing of the repeater power feed current between the main cable and the branch. This work is limited to the link connecting Ezerfontein in south Africa and Lekki in Nigeria.

Optical Fibre Submarine Cable

Optical fibers serve as foundation of an optical transmission system because optical signals are transported through them from one point to another. Its advantages of low-loss and very high bandwidth allows high-speed signals to be propagated through a long distance before the amplification is requires [4]. A low-loss optical fiber is fabricated from different materials; the basic raw material being pure silica, is doped with different materials in order to alter the refractive index of optical fiber.

Single Mode Fiber Optic Cable

Single Mode fiber optic cable has a small diametral core that allows only one mode of light to

propagate. Because of this, the number of light reflections created as the light passes through the core decreases, lowering attenuation and creating the ability for the signal to travel further.

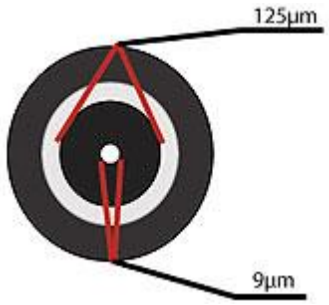


Fig. 2: Single Mode Fibre Cable. [5].

Single Mode fiber is usually 9/125 in construction. This means that the core to cladding diameter ratio is 9 microns to 125 microns.

Repeaters (Amplifiers)

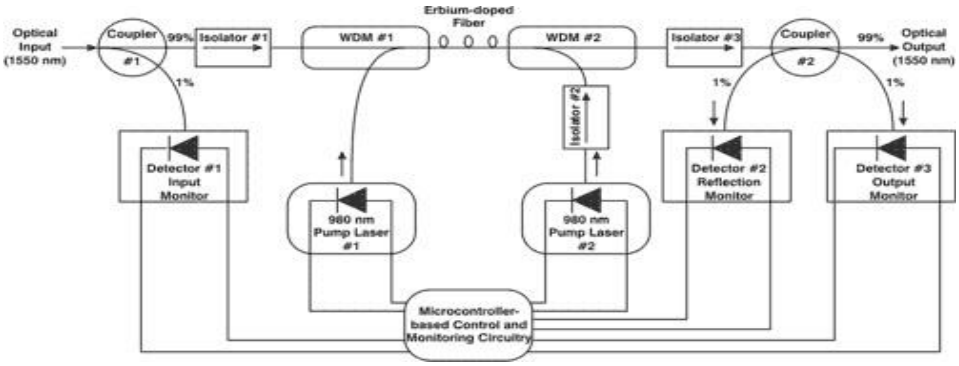


Fig. 3: Optical Repeater [6].

As earlier mentioned, repeaters are very vital in that if it is exempted in the network; the whole set up will be paralyzed. The repeater can be described thus:

Performance designed to match needs of system

Two sizes presently available

Costs strongly dependent on number of fiber pair and performance

Spacing (between repeaters) set for system performance / cost, and typically 50-80km (for recent technologies, 400-600km)

Shorter spacing generally yields higher ultimate capacity

In long (many thousand km) systems, often largest single component network cost.

For point-to-point network, we have the system set-up as in this frame.

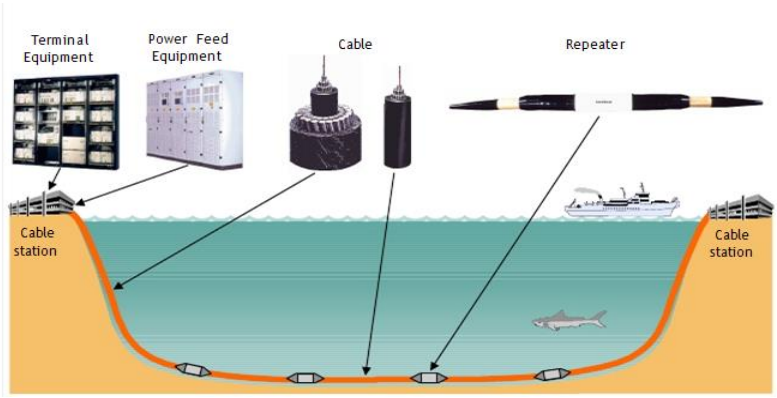


Fig. 4: Point to Point Link [2].

The transmission distance of a fiber-optic communication system has traditionally been limited by fiber attenuation and by fiber distortion. By using all optical repeaters, these problems have been eliminated. These repeaters do not convert the signal into an electrical signal. Because of the high complexity with modern wavelength-division multiplexed signals (including the fact that they had to be installed about once every 64 km), the cost of these repeaters is very high.

The purpose of an optical repeater/amplifier is to restore the signal power level, reduced due to losses during propagation, without any optical to electrical conversion. The general form of an optical amplifier is given in Fig. 3. Most optical amplifiers amplify incident light through the stimulated emission, the same mechanism that is used in lasers, but without the feedback mechanism. The main ingredient is the optical gain realized through the amplifier pumping (electrical or optical) to achieve the population inversion. The optical gain, generally speaking, is not only a function of frequency, but also a function of local beam intensity. To illustrate the basic concepts, we consider the case in which the gain medium is modeled as two-level system, as shown in Fig. 3. The amplification factor G is defined as the ratio of amplifier output Pout and input Pin powers G = Pout/Pin. The amplification factor can be determined by knowing the dependence of evolution of power through the gain media.

$$\frac{dP}{dz} = gP, \quad g(\omega) = \frac{g0}{1+(\omega-\omega0)^2} \tag{1}$$

g is the gain coefficient, g0 is the gain peak value, ω0 is the atomic transition frequency, T2 is the

dipole relaxation time (< 1 ps), ω is the optical frequency of incident signal, P is the incident signal power, and PS is the saturation power. In the unsaturated regime (P ≪ PS), the differential equation (1) can be solved by separation of variables to get the following dependence of power P(z) = P(0) exp(gz), so that the amplification factor can be obtained by

$$G(\omega) = \exp[g(\omega)L] \quad (2)$$

and corresponding full-width at half-maximum (FWHM) bandwidth is determined by

$$\Delta vA = \Delta vg \sqrt{\frac{\ln 2}{\ln(Go/2)}}, \quad Go = \exp(goL), \quad (3)$$

Where Δvg is the FWHM gain coefficient bandwidth

Branching Unit (BU)

All BU produced in recent time has three terminals. During installation, any of the terminals can be branched off in other to connect more regions based on the structural design.

The fiber cable networks can be switched from the landing station or shore terminal to power the network. This operation is performed using a Power Feed Equipment (PFE). Wavelenght Division Multiplexing (WDM) technology has also helped in the area of increasing the capacity of the network. This WDM helps in branching off selected wavelengths though on limited basis.

Over the time, it has been recorded that the cost of each BU depends on how complex it is and the number of fiber pairs that can be channeled through it.

The Branching Unit is used in Submarine network system to branch off optical traffic signals to landing stations at the shores of the ocean in order to connect the grid of the country branched to. The features and functions of a branching unit is as highlighted below. But before then, it should be stated that for the case study in question; the submarine communication cable has its landing stations in these countries from Yzerfontein Southern Africa to Lekki Nigeria through the following route;

Namibia, Angola, Republic of Congo, Cameroon, Togo, Nigeria

The landings in Namibia, the DRC, and Togo have provided the first direct connections for these countries to the global submarine cable network [2].

II METHODOLOGY

From the data acquired, the Q-Factor with respect to SNR was calculated using the following equations [7]

Q = (4)

Where SNR= signal to noise ratio and is given as: $SNR = \frac{Pout}{KG} = \frac{Pout}{\alpha D}$

Pout= output power, K = number of repeaters, G = repeater Gain,

$\propto$ =attenuation, D = link distance.

ER= Transmission extinction ratio P(1)/P(0) = 0.1

Bf = optical filter bandwidth = 0.4nm

Be= electrical filter bandwidth = 6GHz [2].

From the data, the SNR for all the repeaters is calculated with specific distances and substituted into the Q-factor equation above in other to investigate the quality of transmission of the link. The attenuation is calculated for all the repeaters using the equation for optical:

$\alpha = 10\log (Pin/Pout)$ (8)

The Gain is calculate from the relation:

$G = \frac{P_{out}}{P_{in}}$ (9)

Having investigated the fiber link under consideration, Table 4 shows the amount of power utilized by the various amplifiers per 60 kilometer and the calculated Gain and Q-factor respectively.

Table 4: Transmitted power used per 60 kilometer by the various amplifiers

SELECTED RE-PEATERS I D	PIN	POUT	POUT/KM	GAIN (dB)	SNR (dB)	Q-FACTOR (dB)
POWER BOASTER	0.00	19.00	0	0.0	0	0
RPT1-S1A-1	1.17	15.56	0.018281	13	0.0136	17.085
RPT2-S1A-2	1.20	15.58	0.01875	12	0.0147	17.062
RPT3-S1A-4	1.53	15.55	0.017969	10	0.017	16.848
RPT4-S1A-5	1.71	15.56	0.026719	09	0.0196	16.741
RPT5-S1C	2.05	15.46	0.021406	07	0.0250	16.562
RPT6-S1C	1.71	15.54	0.014688	09	0.0196	16.742
RPT7-S1C	0.75	15.56	0.01875	20	0.0088	17.429

RPT8-S1C	1.32	15.60	0.01125	11	0.0161	16.97
RPT9-S1I	2.42	16.10	0.020938	06	0.0198	16.334
RPT10-S1I	2.09	15.94	0.024375	07	0.0110	16.507
RPT11-S1I	1.31	15.91	0.023594	12	0.0080	16.959
RPT12-S2A	0.94	15.63	0.014688	16	0.0111	17.255
RPT15-S2A	1.15	15.68	0.014688	13	0.0137	17.089
PREAMPLIFIER	2.40	0.00	0.020625	00	0.0000	0.0000

*RPT-REPEATER

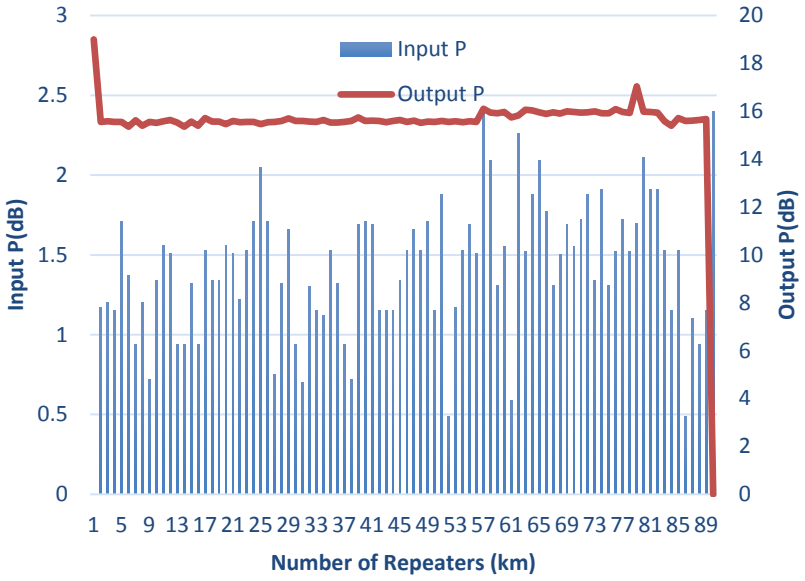


Fig.5 Pout and Pin against Number of Repeaters

Here we find that the output power is almost flat (irrespective of the input value, the output is almost the same), some input power are beyond the 1.5 limit, implying the addition of noise during photodetection and amplification at the EDFA. The implication of the flat output is that the gain of the device is maintained irrespective of the input signal. This informs why the input must be controlled to the acceptable threshold just to limit the multiplicative effect of noise at the EDFA [9].

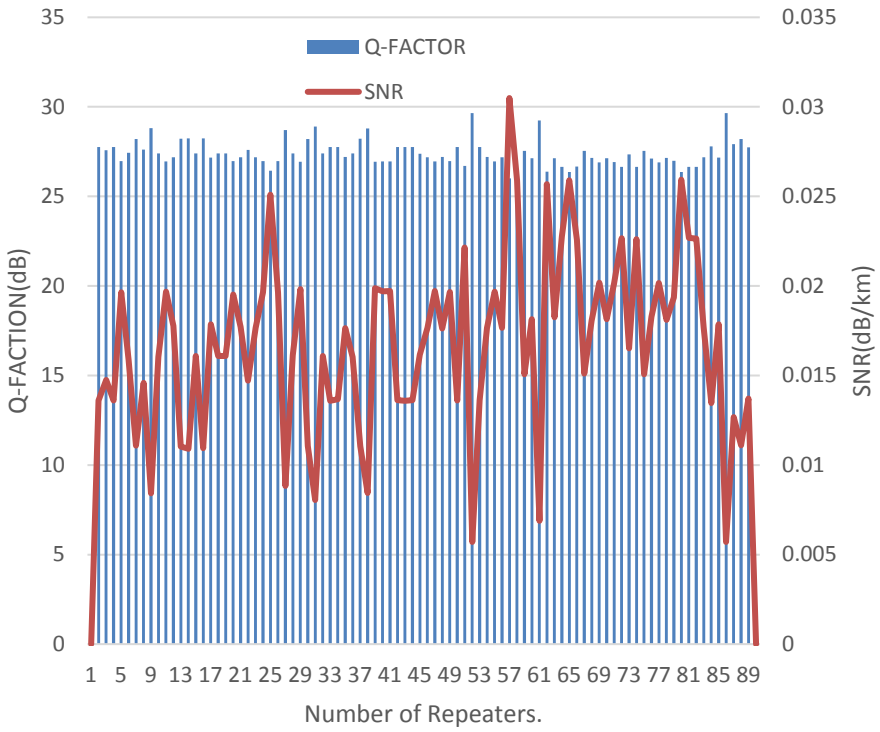


Fig.6: Q-factor, SNR against Number of Repeaters

The sharp spikes explain the inverse relationship between the Q-factor and the SNR. An increase in one reduces the other for the range of values. It is also important to observe that, as the signal propagates, it becomes noisier and the effects become more significant. In this research, from our calculations using 1.50dB as a typical case, an SNR of 0.024dB is the acceptable value. This value is usually selected based on input and output values under review.

III Analysis

From Fig.6, it is seen that a high SNR gives rise to a better Q-Factor and thus implies that the Q-Factor reduces as the SNR tends to unity (the lower the Q-Factor in dB, the better the transmission quality).

The time rate of photon emission and absorption are 1μ second and 10mseconds respectively [8]. This implies that 10% of the laser power is lost to spontaneous emission which becomes the significant noise power (Noise figure). Exactly 50% of the repeaters have their input more than the threshold power, with an average of 0.21dB more which is regarded as noise because the input

power is recorded after photodetection. This value constitutes 12% of the input power. Now using the minimum noise figure Fn= 3dB [8], 20% of the output power is actually noise. Cumulative noise Nc = 0.21*44 (number of repeaters with noise above the threshold = 9.24dB. Recall that the gain is flat at 10dB (vendor standard), therefore, at the output of the preamplifier, we will have P= G * NC =19.24dB. This becomes the recorded power observed at the output of the post-amplifier which implies that 48% of the signal received at the landing station is noise power.

IV Conclusion

It has been established through literature that in the process of amplification in a repeater to raise the input power level, noise is added to the system. This explains why we were able to get more signals received beyond the acceptable value. In general, for better quality of service delivery and efficiency, the bulk of data and voice traffics dumped in our landing stations should be distributed to the homes (FTTH) for utilization. Cumulative effect of noise actually reduces the quality of signals transmitted. This is consistent with [9]. This research work has established that the link has an excess cumulative noise of 9.48dB in the output of the preamplifier which is 48% of the received signal due to a problem in manufacturing. This is possible because most of the APDs are most likely to be set within the operational region in the breakdown knee. It is recommended that a background check be done on the systems to be installed and the APDs of the EDFA controlled to the required amplification status as the optical signal is incident on it in other to give out an acceptable output.

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IN SUBMARINE TRANSMISSION

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ABSTRACT

Modern communication has been revolutionized by the introduction of submarine fibre optic cable system because of their high data transmission capacity, acceptable signal to noise ratio, moderate transmission quality factor (Q-Factor), lower attenuation and efficient gain. In the light of all these break-through, some challenges like the introduction of noise at the amplifying devices also confront the medium. This research work has been able to demonstrate that an increase in the Signal to Noise Ratio leads to a reduction in the Q-Factor and consequently a degradation in the transmitted signal. Thus the SNR should be maintained as close to unity as possible. A typical SNR of 0.024dB is most preferred for the network under consideration with an input power of 1.5dB which yield a Q-Factor of 16.70dB.

Key Words: Q-Factor, SNR, Submarine and communication

1. INTRODUCTION

The sea environment is the primary element that makes submarine systems so peculiar, as it creates the requirements before and during the operational life of a link. A submarine cable system is mostly submerged at great depths, hence cable and equipment must withstand extreme pressures, be hermetic to water ingress and electrically isolated from sea water, as well as feature extreme degrees of reliability because repair operations at sea are time-consuming and (Agrawal, 2007). Figure 1 describes the submarine link and the components.

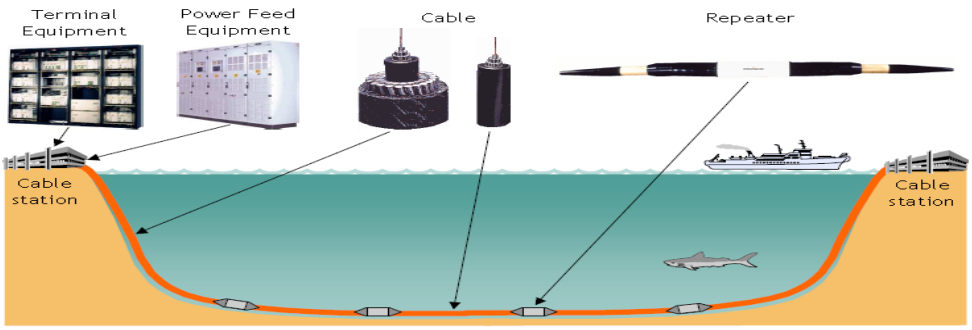


Figure. 1: Submarine network layout (Alcatel, 2010).

Installing or repairing a submarine cable system requires highly specialized ships and experienced personnel. Submarine cables must feature a very strong mechanical resistance against traction and abrasion (ITU-T, 2010), provided by armoring, and they are often buried under the seabed to protect them from trawlers or anchors in areas of intense naval activity. In West Africa, several links exist and they constitute the major communication media to the global fibre link.

Table 1. shows the various submarine links to the West African Cable System (WACS). The various submarine networks in the table give detailed description of the total length, system capacity and date of completion. WACS network under consideration has a total length of 14000km, a capacity of 5.12Tb/s and was completed in 2011.

Table1. Network Operator: cost of installation and total link distance (Simon 2013).

	Sea-com	EASSY	TEAMs	WACS	MainOne	GLO 1	ACE	SArt	WA-SACE	BRICS
Cost (Millions of USD	650	265	130	650	240	300	700	500	?	?
Length (km)	13,700	10,000	4,500	14,000	7,000	9,500	14,000	9,000	34,000	
Capacity	1.28Tbs	4.72Tbs	1.28Tbs	5.12Tbs	1.92Tbs	2.5Tbs	5.12Tbs	12.8Tbs	40Tbs	12.8Tbs
Completion	July 2009	July 2010	Sept 2009	Q3 2010	Q2 2010	Q3 2010	Q2 2012	Q2 2013	2014	2014

The layout of the different WACS link is illustrated in Fig. 2. However, this research will focus on the link connecting Yzerfontein in South Africa to Lekki in Nigeria.

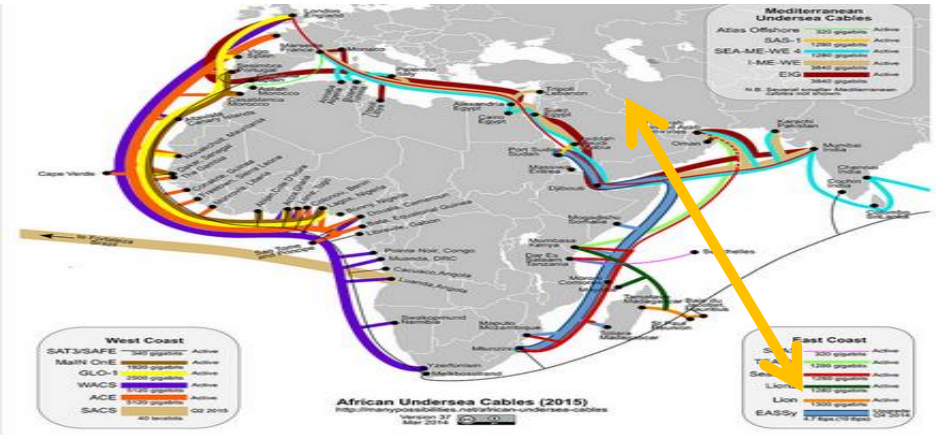


Figure 2: WACS submarine link (Simon, 2013).

The submarine communication network has the following components: cable station, Optical transmitter, optical fibre cable, optical amplifier/repeater and optical receiver. However, when optical signals are transmitted, they get attenuated after a long distance and fades away, hence the need to amplify the degraded signal (Ukagwu *et al*, 2017). This activity of amplification is carried out at the Repeater/Amplifier unit.

1.1 Optical Repeaters/Amplifiers

In an optical communication, signals from the transmitter are attenuated by the optical fibre as they propagate through it. After some distance, the cumulative loss of signal strength causes the signal to become too weak to be detected, hence the need to restore the signal strength.

Repeaters are very vital in that if it is exempted in the network; the whole set up will be paralyzed (Balaji *et al*, 2003).This is because the signal cannot be transmitted through a long-haul cable without being amplified. Two sizes currently available are: 1 to 4 fibre pair and 5 to 8 fibre pair (Agilent, 2003).

Each repeater in an optically amplified line contributes some noise to the system, and this noise is amplified in turn by subsequent repeaters. As each repeater compensates (almost exactly) for the loss of the preceding section, the total accumulated noise is approximately equal to noise of one repeater multiplied by the number of repeaters (Alcatel, 2010). As a consequence, there is a gradual increase in noise along the system, which leads to depreciating signal-to-noise ratio as a function of distance.

The optical SNR is approximately proportional to (Jose *et al*, 2002)

$$\frac{P_{out}}{KG} \approx \frac{P_{out}}{\alpha D}. \quad (1)$$

where, P_{out} and G are the repeater average output power and gain (in linear units), K is the number of repeaters, D is the total system length (in km) and α is the attenuation of line fibre (in dB/km).

According to equation (1), the SNR decreases linearly with the number of amplifiers (at constant gain) and exponentially with the amplifier spacing (at constant number of amplifiers). To obtain a good SNR at the end of the line, it is beneficial to increase the repeater output Power by 20mW (Ukagwu *et al*, 2017).

The transmitted signal propagates through series of amplifiers over a long-haul and the process of amplification is consequently performed until the signal arrives at the landing station. Several types of amplifiers exist and they include Erbium Doped Fibre Amplifiers, Raman Amplifiers and Semiconductor Amplifiers. The amplifier under consideration in the selected link is the Erbium Doped Fibre Amplifier (EDFA).

1.2 Erbium Doped Fibre Amplifier (EDFAs)

Erbium-doped fibre amplifiers (EDFAs), which were the first Optical Fibre Amplifiers (OFAs) to be developed, are widely used in optical fibre communication systems,, they offer high polarization-independent gain, high output power, low insertion loss, low noise, and a broad transition near $\lambda = 1.55$ μm (corresponding to the wavelength of minimum loss for silica optical fibres. Pumping is achieved by longitudinally coupling light into the amplifying medium, usually from strained quantum-well InGaAs laser diodes operating at $\lambda_o = 980$ nm. The pump light may be injected in the forward or backward direction, or bi-directionally (Sunil, 2012).

Gains in excess of 50 dB can be achieved in EDFAs with tens of mW of pump power, and signal output powers in excess of 100mW are readily generated. The available bandwidth is $\lambda \approx 40$ nm, corresponding to frequency of $\nu \approx 5.3$ THz, which accommodates the C band. The L band is also readily covered although the optimization parameters of the EDFAs are not the same in the two bands. The large gain and bandwidth

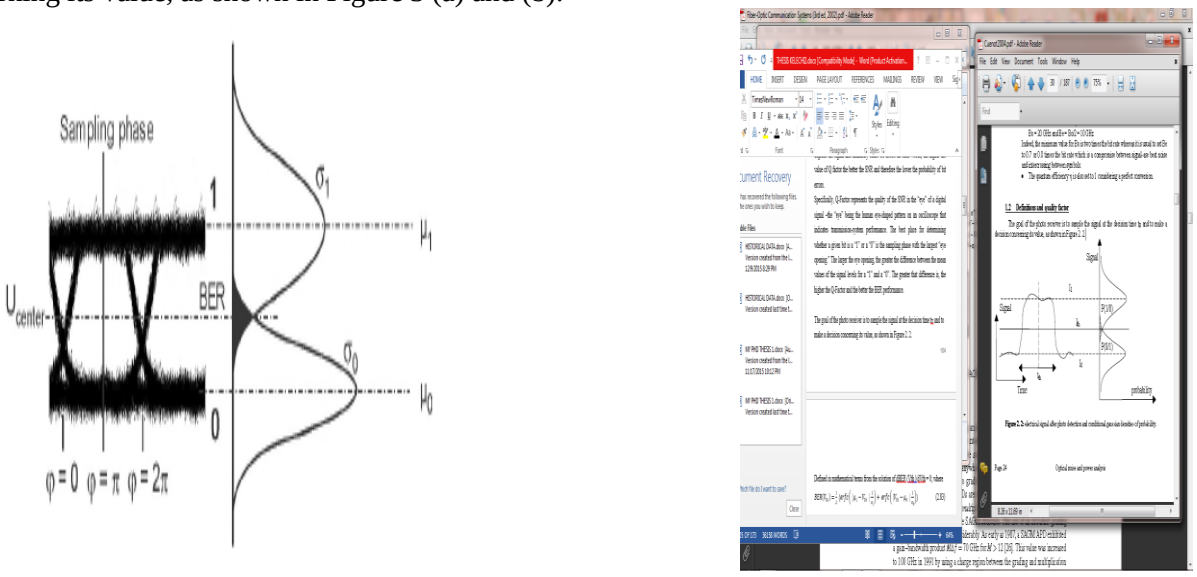
offered by these amplifiers make them highly suitable for use in wavelength-division multiplexing (WDM) systems (Agrawal, 2002).

1.3 Transmission quality factor in submarine communication system q-factor theory

To better understand what Q-Factor testing can and cannot do, it is helpful to examine first exactly what Q factor theory is. Q factor measures the quality of a digital transmission signal in terms of its signal-to-noise ratio (SNR). As such, it takes into account physical impairments to the signal, for example, noise, chromatic dispersion and any polarization or non-linear effects – which can degrade the signal and ultimately cause bit errors. In other words, the higher the value of Q-factor the better the SNR and therefore the lower the probability of bit errors.

Specifically, Q-Factor represents the quality of the SNR in the "eye" of a digital signal –the "eye" being the human eye-shaped pattern on an oscilloscope that indicates transmission-system performance. The best place for determining whether a given bit is a "1" or a "0" is the sampling phase with the largest "eye opening." The larger the eye opening, the greater the difference between the mean values of the signal levels for a "1" and a "0". The greater that difference is, the higher the Q-Factor and the better the BER performance.

The goal of the photo receiver is to sample the signal at the decision time t_D and to make a decision concerning its value, as shown in Figure 3 (a) and (b).



(a) (b)

Figure 3: (a) Eye diagram from an Optical spectrum analyzer (OSA) (Agilent, 2003) and (b) Electrical signal after photo detection and conditional Gaussian densities of probability (Cuenit, 2004).

The decision circuit compares the received sampled value to the threshold value I_{th} and forces the bit value to '1' when $I>I_{th}$ and to '0' when $I<I_{th}$. An error occurs when $I>I_{th}$ whereas the value of the bit symbol is 0 and vice versa. We can define the error probability as:

$$Error\ probability = p(1) \times p(0|1) + p(0) \times p(1|0) \quad (2)$$

where p(1) and p(0) are the probability to transmit a symbol '1' and '0' respectively. p(0|1) and p(1|0) are the probability of incorrect identification. Assuming the same number of symbols 0 and 1, we have:

P(1)=P(0)=1/2

$$Error\ probability = \frac{1}{2} \times [p(0|1) + p(1|0)] \quad (3)$$

Assuming that the distribution of the different sources of noise is Gaussian, we can deduce that the

distribution of noise on symbols '1' and '0' is also Gaussian and can be defined by their variancesσ_1^2 *and* σ_0^2. It is then possible to define the conditional probabilities *p(1|0) and p(0|1)* (Desurvire, 2002):

$$p(0|1) = \frac{1}{\sigma_1}\sqrt{2\pi}\int_{-\infty}^{I_{TH}} e\frac{(I-I_1)^2}{2S_1^2}dL = \frac{1}{2}erfc\left[\frac{I_1-I_{TH}}{\sigma_1\sqrt{2}}\right]$$

$$p(1|0) = \frac{1}{\sigma_0}\sqrt{2\pi}\int_{-\infty}^{I_{TH}} e\frac{(I-I_0)^2}{2S_0^2}dL = \frac{1}{2}erfc\left[\frac{I_0-I_{TH}}{\sigma_0\sqrt{2}}\right] \quad (4)$$

where erfc is the complementary error function defined by:

$$erfc(x) = \frac{2}{\sqrt{2\pi}}\int_x^{+\infty} e^{-y^2}dy \quad (5)$$

The bit error ratio can then be expressed as:

$$BER = \frac{1}{4}\times\left[erfc\left(\frac{I_1-I_{th}}{\sigma_1\sqrt{2}}\right) + erfc\left(\frac{I_{th}-I_0}{\sigma_0\sqrt{2}}\right)\right] \quad (6)$$

This rate depends on the decision threshold I_{th}. Generally, the decision threshold is chosen to minimize the bit error rate. A good approximation for I_{th} is:

$\frac{I_1-I_{th}}{\sigma_1} = \frac{I_{th}-I_0}{\sigma_0}$ $leading\ to\ I_{th} = \frac{\sigma_0\times I_1+\sigma_1\times I_0}{\sigma_0+\sigma_1}$

We associate the quality factor to the bit error rate through the relationship:

$$BER = \frac{1}{2}erfc\left(\frac{Q}{\sqrt{2}}\right) = \frac{1}{\sqrt{2}}\int_{\frac{Q}{\sqrt{2}}}^{+\infty} e^{-y^2}dy$$

$$BER \approx \frac{e^{-\frac{Q^2}{2}}}{Q\sqrt{2\pi}} \quad (7)$$

This last approximation is valid for Q>3.

And thus, we have the relation:

$$Q = \frac{I_1-I_0}{\sigma_1-\sigma_O} \quad (8)$$

Also, the Q-factor relation can be represented as (Jose, 2002)[9]:

$Q =$ (9)

This equation (9) considers the SNR, the ration between the optical and electrical filter bandwidth and the extinction ratio.

As illustrated above, Fig 3 (a), the width of the curves represents the noise in the signal, hence the lower the noise, the narrower the distribution curve and therefore the smaller the overlap. Indeed, the overlap area on the distribution curves is what determines the BER, for that is where the receiver has a greater chance of interpreting a '1' as a '0' and vice versa, misinterpretations that produce bit errors.

However, that overlap area also is the section that deviates from true Gaussian or normal signal distribution, primarily because of transmission impairments and measurement inaccuracies. Hence, this deviation from the theoretical leads to the inaccuracies in estimating BER. Various ITU-T work/study groups (Agilent, 2003) are trying to determine how to extrapolate the distribution curves more accurately, so as to predict the extent of this deviation more accurately and make the BER estimation more accurate. Unfortunately, until they succeed, network operators and NEM installers cannot be certain their Q-Factor measurements are producing accurate BER estimates.

If the estimated BER is inaccurate and the decisions based on it include replacing cards or postponing testing, then this will result in significant and unnecessary costs and delays in turning up new revenue earning services – the two things operators most want to avoid.

Adding to the uncertainty of what is actually measured in the Q-Factor approach are the questions about how to measure Q factor. There are various ways to measure Q factor today, but the two most common ones are the voltage-histogram method and the variable optical-threshold method but in this research, it was calculated using equation (9).The first technique (Figure 4) estimates Q factor by using a digital sampling scope to measure both voltage histograms at the center of the eye diagram and the standard deviation of the noise at both signal levels (Agilent, 2003).

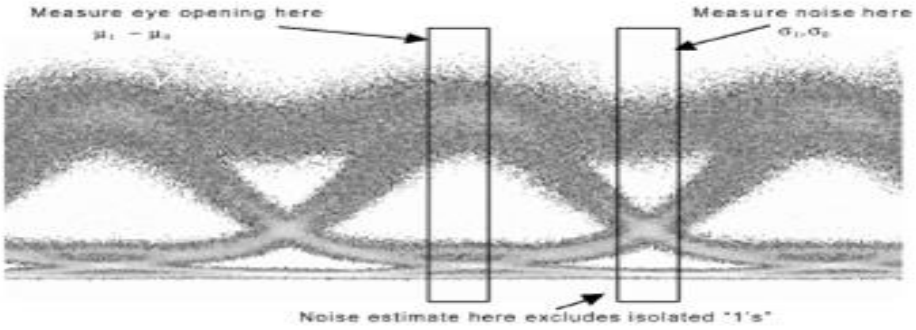


Figure 4: Voltage Histogram (Agilent, 2003).

One of its limitations is the fact that the sampling rate of the scope allows only a small portion of the high bit rate to be sampled. For example, when used to measure a 10-Gbps signal, a scope with a sampling rate of 1M/sample(s) can sample only one bit out of every 100,000 bits, meaning the Q-Factor measurement is based only on a very small portion of the data stream. To make matters worse, the front end of the scope adds noise that can distort the real noise value and thus significantly skew the Q-Factor measurement.

Finally, the voltage-histogram method does not take into account the effects of inter-symbol interference (ISI), or dispersion, which causes pulses to spread out so they appear in adjacent time slots. Because ISI effects can obviously broaden the estimated noise values, they can further skew the Q-Factor measurement. Although network operators and NEM installers can use a specific 1010 pattern to eliminate the ISI, they typically test their systems with PRBSs (pseudo-random bit streams) that closely approximate live traffic. Consequently, ISI effects, along with the other limitations mentioned earlier, make the voltage-histogram method a less-than-ideal choice for measuring Q-Factor – and for calculating that critical BER – in real transmission systems.

Another problem of Q-factor measurement is test equipment. At first glance, the variable-decision-threshold method of Q-Factor measurement would seem to solve the problem of reducing the time needed to make BER measurements on very-low-BER systems. Unfortunately, it cannot reliably replace the long-term BER measurement for all applications (Sunil, 2012). Until test set receiver requirements are standardized, the incompatibility between different test equipment will produce varied results. To clarify, if the NEM installers measure Q factor with one receiver and a service provider measures it with another receiver, they may get different results. Consequently, the use of different Q factor test sets to calculate the BER will result in different BER values.

Unfortunately, technicians do not have the necessary skills to make accurate Q-Factor measurements, even without compensation techniques or optical channel filters being considered. Such tasks require experienced engineers, a fact that further increases the cost of Q-Factor testing (Agilent, 2003).

1.4 The Role of Q-Factor.

In spite of the limitations of Q-Factor testing as a way to estimate BER in transmission systems, it can play an important role in manufacturing operations. For example, a manufacturer obtains greater Q-Factor accuracy by using "golden" transmitters and receivers, and calibrated equipment that takes into account the noise contributions and other limitations of test receivers. If there is any doubt as to the accuracy of the Q-Factor measurement, the manufacturer simply can substitute the "golden" receiver for the test receiver and then check the results.

Another application (Figure 5) that lends itself to Q-Factor testing is optical fibre submarine cable systems. Measurement techniques that have proven to be adequate during the development process are likely to verify the interface specifications for the amplified sections, which obviously do not represent the entire transmission link. Such indirect parameters include Q factor and optical SNR and accumulated chromatic dispersion. The results, when included as part of the full commissioning tests over the required stability period, can be useful as reference data for future operation, maintenance and repair of the system.

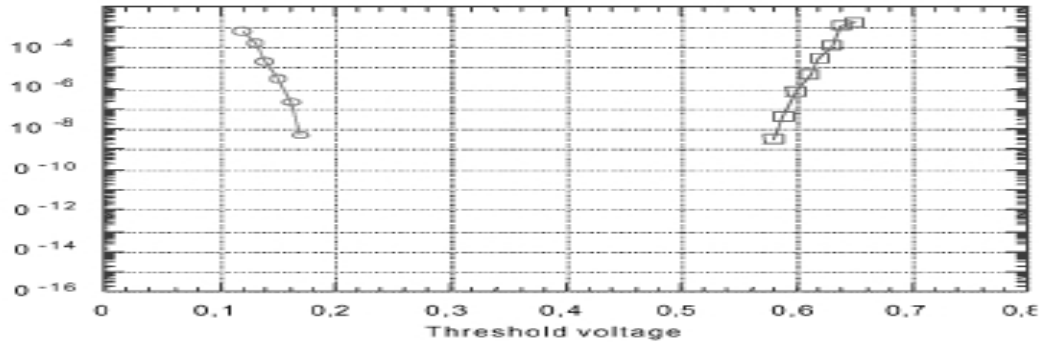


Figure 5: BER measurement. (Agilent, 2003).

1.5 Signal-To-Noise Ratio (SNR)

There is no universal definition of SNR, but for this report a convention will be adopted to for electrical and optical SNRs. The reason for this is to eliminate a common source of confusion, and to ultimately enable the addition of noise distributions from different sources on an apples-to-apples basis. The optical SNR (oSNR) and electrical SNR (eSNR) are defined as (Robert, 2004):

$$oSNR \equiv \frac{Average\ Signal\ Power}{Optical\ Noise\ Power} = \frac{I\ optical}{S\ optical}$$

$$eSNR \equiv \frac{Average\ Sinal\ Voltage}{RMS\ Noise\ Voltage} = \frac{V\ electrical\ signal}{S\ electricalsignal} \quad (10)$$

An example of the eSNR would be with respect to the signal and noise at the input of the digital decision circuit (DDC). It is important to make a distinction between electrical and optical SNRs. To convert an eSNR to an oSNR- like value, the power-equivalent SNR value is calculated:

$$\text{eSNR} \alpha \frac{Average\ Sinal\ Voltage}{RMS\ Noise\ Voltage} = \frac{(V\ electrical\ signal)^2}{(S\ electricalsignal)^2} \quad (11)$$

One must also be careful when making measurements where a voltage represents an optical signal. In this case

$$\text{oSNR} \alpha \frac{Average\ Signal\ Power}{Optical\ Noise\ Power} = \frac{(I\ optical)^2}{(S\ optical)^2} \quad (12)$$

2. METHODOLOGY

The internal parameter is centered on repeaters mostly. The network architecture is designed in such a way that the signal does not escape from the channel either from the transmitter or the receiver. The measured data consists of the optical power sent from the transmitter's output to the input of the repeater. The signal attenuates as it propagates down the fibre but is amplified at the repeater. The repeater is also known as optical amplifier with the recent technology focused on erbium doped fibre amplifiers (EDFA). This technology records minimal dispersion and hence low attenuation. The PFE has computer interface and thus compatible with PCs. Figure 6 shows how the serial cable can be used to connected the submarine network element.

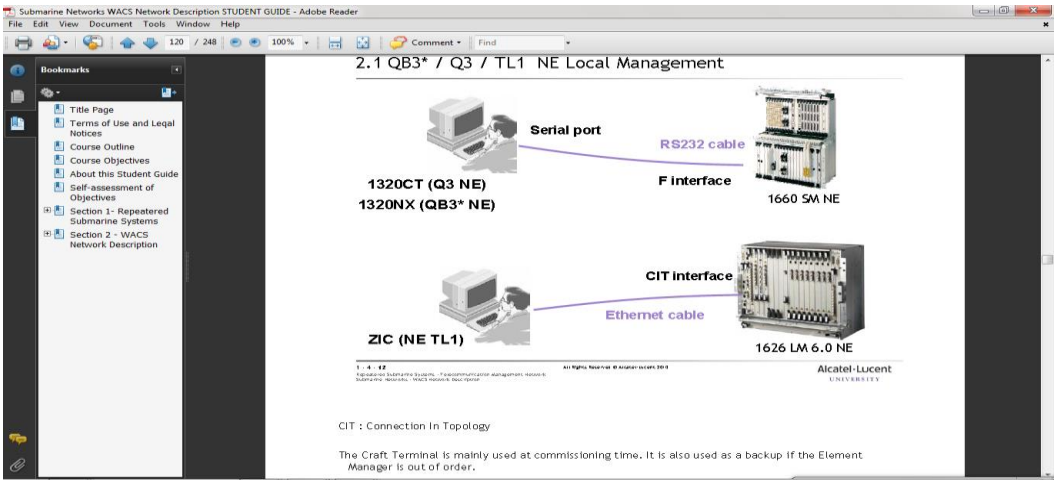


Figure 6: Data acquisition method (Alcatel, 2010).

The TMN is structured in layers, which includes: Element Management Layer (EML) and Network Management Layer (NML) to manage the network element configuration, alarms and performance. The stages below explain the data acquisition procedures.

Stage 1: The RS232 cable was connected at the F interface of the 1660 SM NE (PFE) to the 1320 CT, Craft Terminal proposed for the Q3 Network Elements. Q3 is a standardized network management interface, according to ITU-T recommendations. It provides the necessary local operation and maintenance functionality.

The **IOO** (Internet Order Online) is an open interface that exports Alarm Data, Performance Monitoring Data, NE Directory Data and NE Remote Inventory Data. It also exports the remote inventory data of the NEs managed through ASCII (American Standard Code for Information Interchange) interface via TCP/IP (Transmission Control Protocol/Internet Protocol).

1350 OMS - SN displays Network measurements and performances management. From this display, Acquisition of repeater measurements (input and output optical power) and alarm generation on threshold crossings are made possible.

Stage 2: From the OMS1350, proceeded to GUI (Graphics User Interface) Desktop display. This window contains a menu, a tool bar, a status bar, 3 panels (the tree explorer, the thumbnail view and a console) and a desktop displaying the different views of the application (Network, Fibre Pair, Line, Optical, Power). This is shown in Figure 7.

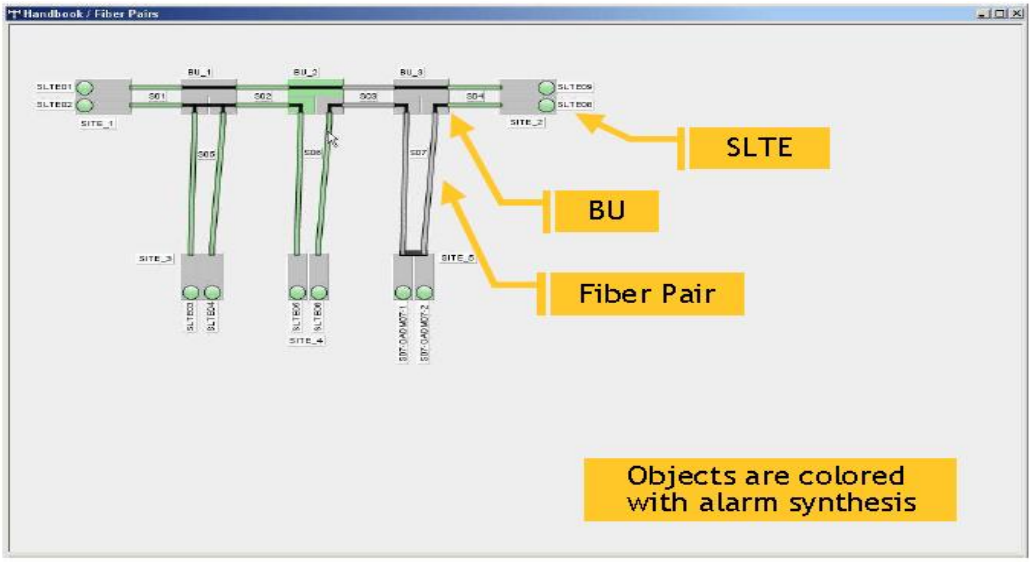


Figure 7: Fibre Pair View

Stage 3: Go to Fibre Pair Optical Path view, the data is displayed as shown Figure 8.

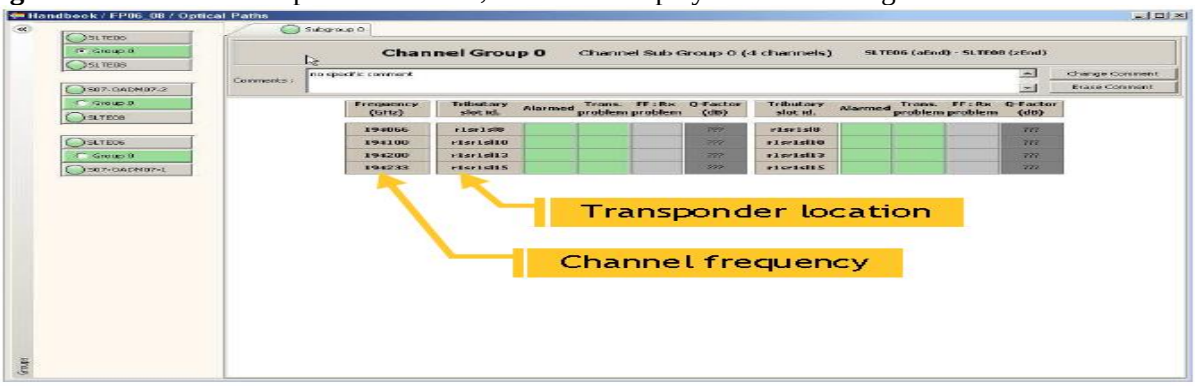
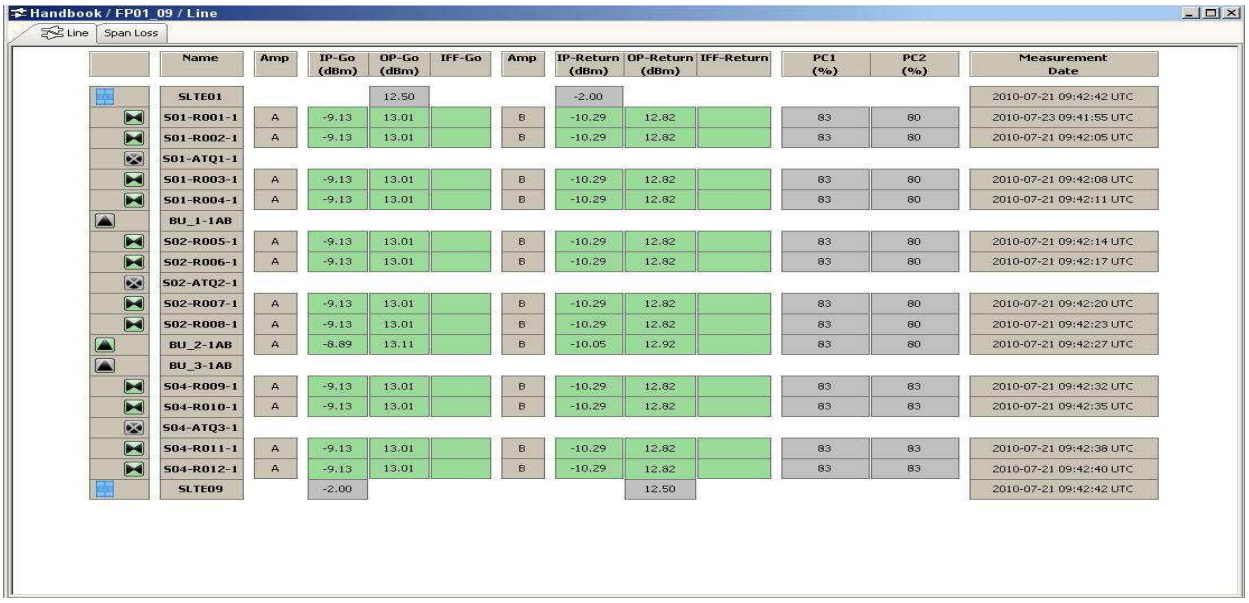


Figure 8: Optical path view.

At the right side an optical channel table of the selected group displays optical path information at either end of the optical path (channel frequency, protection status, tributary identifier, cable fault indication and Q-Factors).

Stage 4: Proceed to Line view to get the display in Figure 9.



	Name	Amp	IP-Go (dBm)	OP-Go (dBm)	IFF-Go	Amp	IP-Return (dBm)	OP-Return (dBm)	IFF-Return	PC1 (%)	PC2 (%)	Measurement Date
	SLTE01			12.50			-2.00					2010-07-21 09:42:42 UTC
	S01-R001-1	A	-9.13	13.01		B	-10.29	12.82		83	80	2010-07-23 09:41:55 UTC
	S01-R002-1	A	-9.13	13.01		B	-10.29	12.82		83	80	2010-07-21 09:42:05 UTC
	S01-ATQ1-1											
	S01-R003-1	A	-9.13	13.01		B	-10.29	12.82		83	80	2010-07-21 09:42:08 UTC
	S01-R004-1	A	-9.13	13.01		B	-10.29	12.82		83	80	2010-07-21 09:42:11 UTC
	BU_1-1AB											
	S02-R005-1	A	-9.13	13.01		B	-10.29	12.82		83	80	2010-07-21 09:42:14 UTC
	S02-R006-1	A	-9.13	13.01		B	-10.29	12.82		83	80	2010-07-21 09:42:17 UTC
	S02-ATQ2-1											
	S02-R007-1	A	-9.13	13.01		B	-10.29	12.82		83	80	2010-07-21 09:42:20 UTC
	S02-R008-1	A	-9.13	13.01		B	-10.29	12.82		83	80	2010-07-21 09:42:23 UTC
	BU_2-1AB	A	-8.89	13.11		B	-10.05	12.92		83	80	2010-07-21 09:42:27 UTC
	BU_3-1AB											
	S04-R009-1	A	-9.13	13.01		B	-10.29	12.82		83	83	2010-07-21 09:42:32 UTC
	S04-R010-1	A	-9.13	13.01		B	-10.29	12.82		83	83	2010-07-21 09:42:35 UTC
	S04-ATQ3-1											
	S04-R011-1	A	-9.13	13.01		B	-10.29	12.82		83	83	2010-07-21 09:42:38 UTC
	S04-R012-1	A	-9.13	13.01		B	-10.29	12.82		83	83	2010-07-21 09:42:40 UTC
	SLTE09		-2.00					12.50				2010-07-21 09:42:42 UTC

Figure 9: Optical line view

The Line View shows the submerged Line Equipment. It allows performing measurements on Repeaters and Bus. From this display, the data is downloaded and recorded.
Once this is successfully achieved, we go to output signal folder, thereafter the output power and repeater. The details of the transmitted power from the PFE to the repeaters are displayed on the computer with time stamps on them as we will see in the data table. This process was repeated once every year for two years due to limited access to the PFE base station. The various repeaters are placed at specific distances apart and the activities there in are recorded through this process.
From Yzerfontein South Africa to Nigeria is an optical fibre of length 5608km buried under water to transmit and share data between the two locations. The link has several branching unit branching units which branches off the signal to the landing stations of the neighboring countries with the sole interest of connecting their national grid. The signal is branched off at Angola, Namibia, Congo, Cameroon, Ivory Coast, Congo DR, Nigeria and so on but the link is between Yzerfontein in South Africa to Sexial in Portugal with a total length of 11378km. But the section under consideration (Yzerfontein to Lekki) has a length of 5608km.

3. RESULTS

There are some basic factors responsible for receiving effectively transmitted signal at the receiver of the landing station. Modern fibre cable is designed to accommodate a minimum attenuation of 0.2dB/km. The implication is that optical signals can travel a longer distance before requiring amplification. With due consideration to our link of study, a typical of 64km distance is traveled before amplification. Since amplification is a necessity, EDFA amongst many amplifiers was considered to be the most effective in terms of Gain, SNR, compatibility with WDM technology and minimum attenuation amongst other characteristics to be used as an optical amplifier. Ideally, repeater-less systems or network gives a better Q-factor than point-to-point repeater network (Sunil, 2012). So far, the transmission distance lies within the amplification range; hence, effective transmission for longer distances requires optical amplifiers.
Recall that the transmission quality (Q-factor or simply Q) as defined earlier in equation (9) is giving by:
Q = ,
where SNR ⇒ Signal to Noise Ratio, ER ⇒ Extinction Ratio, Be and Bf⇒ Optical and Electrical filter Bandwidth respectively.
Recall also that from (1) SNR is giving by:

$SNR = \frac{Pout}{KG} = \frac{Pout}{\alpha D}$

where Pout ⇒ Output power, K ⇒ Number of Repeater , G ⇒ System Gain, D ⇒Repeater spacing and α ⇒ Attenuation which is represented as:

$\alpha = 10log\ (\frac{P_{out}}{P_{in}})$ (13)

The data acquired from the link under consideration is as presented in Table 2. Some of the repeaters are deliberately omitted just to shorten the table but are capture in Figure 10.

Table 4.1 Data calculated from the acquired input and output powers

S/N	REPEATER ID	P_{IN} (dB)	P_{OUT} (dB)	SNR (dB)	Q-FACTOR (dB)
	SLT2NYZF	0	19	0	0
1	S1A-R1A01-2	1.17	15.56	0.021634	17.08547
2	S1A-R1A02-2	1.2	15.58	0.021865	17.06242
3	S1A-R1A03-2	1.15	15.56	0.021491	17.09989
11	S1A-R1A11-2	**1.51**	15.63	0.024061	16.85453
12	S1A-R1A12-2	0.94	15.53	0.019922	17.26449
13	S1A-R1A13-2	0.94	15.35	0.019773	17.28076
14	S1A-R1A14-2	1.32	15.57	0.0227	16.98098
15	S1A-R1A15-2	0.94	15.4	0.019814	17.27622
16	S1A-R1A16-2	1.53	15.72	0.024277	16.83516
17	S1A-R1A17-2	1.34	15.57	0.022839	16.96771
18	S1A-R1A18-2	1.34	15.57	0.022839	16.96771
19	S1A-R1A19-2	**1.56**	15.46	0.024251	16.83747
20	S1A-R1A20-2	**1.51**	15.59	0.024026	16.85771
21	S1A-R1A21-2	1.22	15.54	0.021972	17.05177
22	S1A-R1A22-2	**1.53**	15.55	0.024127	16.84861
23	S1A-R1A23-2	**1.71**	15.56	0.025352	16.74111
54	S1E-R1E05-2	**1.69**	15.58	0.025235	16.75111
55	S1E-R1E06-2	**1.51**	15.55	0.023991	16.8609
56	S1I-R1I01-2	**2.42**	16.1	0.030566	16.33493
57	S1I-R1I02-2	**2.09**	15.94	0.028227	16.50777

58	S1I-R1I03-2	1.31	15.91	0.022925	16.95963
59	S1I-R1I04-2	**1.55**	15.97	0.024634	16.8035
60	S1I-R1I05-2	**0.59**	15.74	0.017245	17.57784
61	S1I-R1I06-2	**2.26**	15.82	0.02925	16.43053
62	S1I-R1I07-2	**1.52**	16.06	0.024508	16.8146
63	S1I-R1I08-2	**1.88**	16.03	0.02691	16.61159
64	S1I-R1I09-2	**2.09**	15.95	0.028236	16.50708
70	S1I-R1I15-2	**1.72**	15.94	0.025757	16.70663
71	S1I-R1I16-2	**1.88**	15.95	0.026838	16.61738
72	S1I-R1I17-2	1.34	15.99	0.023204	16.93335
79	S1K-R1K07-2	**2.11**	15.98	0.028396	16.49482
80	S1K-R1K08-2	**1.91**	15.97	0.027056	16.5998
87	S2A-R2A04-2	0.94	15.63	0.020004	17.25551
88	S2A-R2A05-2	1.15	15.68	0.021593	17.08961
89	SLT2SLKI	**2.4**	0	0	0

4. DISCUSSION/ANALYSIS

SNR is one of the most important parameters which define the transmission quality of a signal. Because it is not possible to achieved an SNR of unity, devices are built to maintain a range of values of SNR or as close to unity as possible for an acceptable value of Q-factor. In most cases, the lower the SNR, the Higher the quality of transmission for a given ratio of the square root of the Optical and Electrical filter bandwidths, wavelength and repeater spacing (Mohammed, 2007). Figure 10 is typical of 1550nm wavelength, 64km repeater spacing and a range of SNR values. The plot of Q-Factor and SNR against the number of repeaters as shown in Fig. 10 illustrates the inverse relationship between the two parameters. Hence, the need to maintain their values at an acceptable limit at the various repeaters/amplifiers for effective transmission of signal.

The sharp spikes explain the inverse relationship between the Q-factor and the SNR. An increase in one reduces the other for the range of values. It is also important to observe that, as the signal propagates, it becomes noisier and the effects become more significant. In this research, from our calculations using 1.50dB as a typical case, an SNR of 0.024dB is the acceptable value. This value is usually selected based on input and output values under review.

5. CONCLUSION

Optical Fibre Submarine System is indeed one of the most effective means to transmit optical signals in telecommunication. This is because, even though the signal becomes very weak, it can be recovered to almost the initial value.

The acquired data was used to evaluate the transmission quality (Q-Factor) with respect to SNR and it was observed that an increase as in SNR results to a reduction in Q-factor and vice versa. Hence there is a need to maintain an SNR close to unity as possible in other to effectively transmit signal with low noise and moderate quality of transmission.

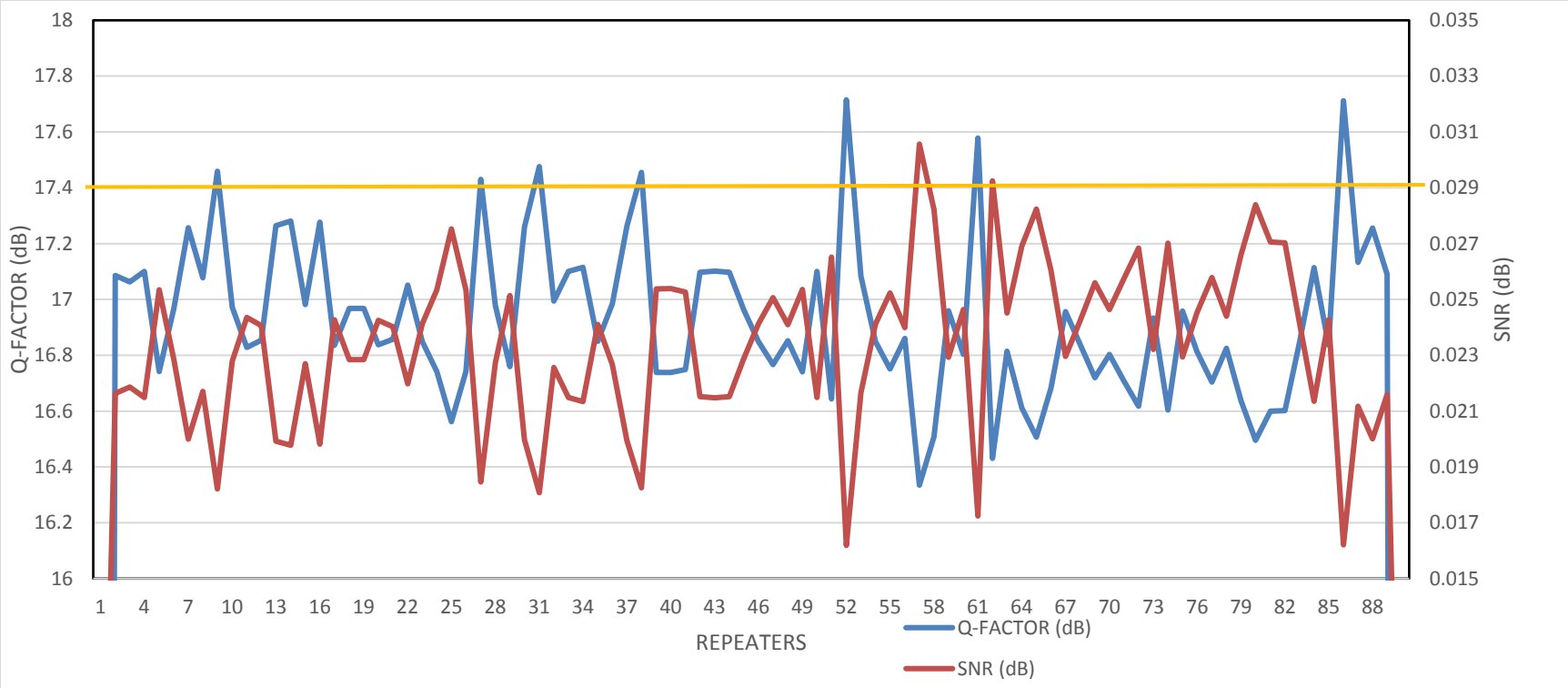


Figure 10: Q-Factor and SNR against number of repeaters.

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ELECTRONIC TECHNOLOGY LITERACY AND PERFORMANCE OF ELECTIONS IN SELECTED STATES IN NIGERIA

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ABSTRACT

Before the adoption of electronic voting technology in 2011, Nigeria's elections were always widely disputed and at times led to post-election violence since her return to democracy in 1999. Such discord was faced in all the three general elections of 1999, 2003 and 2007. According to every post-election technology analysis, electoral disputes were exacerbated by the manual methods exclusively used for the election process. This means the new technology that Nigeria intends maintain for subsequent or future elections was meant redeem the country's electoral credibility. Nonetheless, electoral performance of such potentially redemptive technology reform could not overstated especially its user technicality in a country hi-tech literacy could not be guaranteed. In that case, it was imperative to assess the impact of electronic technology literacy on performance of elections considering the knowledge gap perceived in previous research on Nigeria's electoral automation. For purpose of more recent and exhaustive analysis, the study was limited to the 2015 general elections and six states of Bauchi, Edo, Enugu, Kaduna, Lagos and Niger, fairly selected from the six Zones of the country, respectively. A quantitative and qualitative approach was adopted for the research methodology designed to collect and analyse data from a sample of 265 respondents selected across the six States. The study indicates that performance of the 2015 general elections was highly rated in most of Nigeria at $\bar{x}$= 3.34; s= 1.11. The study further shows that this was partly significantly attributed to a moderate electronic technology knowhow ($\bar{x}$= 3.20; s= 1.15) of which administrability of the technology predicted 93.6%, poll workers' competencies predicted 94.3% and electorate technology interface predicted 92.8% of electoral performance. It was concluded that increase in the level of electronic technology literacy would lead to increase in election performance. The reverse was true. As such it was recommended that stakeholders such as INEC and SIEC should adopt several strategies to maintain and/or develop on people literacy of the new technology for better performance of subsequent elections.

Key Words: Electronic voting technology, Election performance, Technology literacy, Poll workers' technology literacy, Electorate technology literacy, Electronic technology

1. INTRODUCTION

1.1 Background to the Study

Election automation is a recent electoral reform in contemporary democracy. It is one of the latest national policy applications of information technology (IT) that has since history evolved through four successive phases. The current phase is the fourth and most recent of IT evolution that ushered in development of modern computers since the 1940s (Bellis, 2000; Minker, 1998). This phase was preceded by three phases of IT development, beginning with the pre-mechanical phase of 3000 BC– 1450 AD, mechanical phase of 1450-1840, and then the electromechanical phase of

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1840–1940 (Butler, 2012). In the current IT phase, computer technology was first used in the 1952 US presidential elections merely for results tabulation, and widely adopted for greater electoral purposes in the 1970s and 1980s in the United States itself, some Asian, South American and European countries (Laanela, Green & Alves, 2016). The technology was since the 1990s consistently upgraded to more advanced versions such as Direct Recording Electronic voting (DREV) in the US and internet voting in countries like New Zealand (Herb, 2005; Hillygus, 2011).

In Africa, such hi-tech progresses are yet to be achieved because electronic voting technology is largely still in its infancy (Laanela *et al*, 2016). Mainly basic of such technology has been adopted since 2010 with Namibia and South Africa at the forefront (Iwenwanne, 2017; Sambo & Alexander, 2018). In Nigeria, electronic voting was first introduced for the 2011 elections since her return to democratic rule that led to the 1999, 2003 and 2007 general elections (Awojobi, Ayakpat & Oladimeji, 2014). The technology was upgraded for the 2015 general elections by introducing biometric PVC[i] and SCR[ii] machines. Although the new technology was still evolving, it was deemed sufficient to redeem Nigeria's election credibility (Sambo & Alexander, 2018). Nevertheless, this was thought to have a bearing on level of people literacy in the new technology.

According to Summers *et al.* (2014), electronic voting literacy is the technical knowhow and/or knowledge of administering or interfacing with digital systems adopted for election activities. An election is a formal group decision-making process by which a population chooses an individual to hold public office (Webb, Heinz and Gibbins, 2015). In a political sense, it is a sensitive democratic process for which electronic voting technology is sought ensure better election performance. NCSL[iii] (2016) defines electronic voting technology as the use of computerized systems to execute any election activities (Zissis, 2011). There are two forms of electronic voting, namely physically supervised electronic voting (PSEV) and remote electronic voting (REV). In the context of this study, research was about PSEV, which mainly involves location of electronic machines at polling stations (Zissis & Lekkas, 2011). In whatever forms, electronic voting propels election performance when easily used by poll administrators and widely interfaced by the electorate. Kofi (2016) refers to election performance as the extent to which an election is successfully delivered, and the outcome is recognized as free, transparent and credible.

This kind of electoral credibility was never attained in Nigeria's previous elections of the administered through traditional manual systems (Sambo & Alexander, 2018). The manual technology exacerbated lots of electoral irregularities, the gravest of which was vote-rigging with impunity. Elections were easily manipulated than would be in the new technology dispensation. According to reports on recent elections, the new technology significantly reduced past election irregularities the country grappled with but even the 2015 elections faced challenges (Iwenwanne, 2017; Muluzi, 2015; Osita, 2016). One on the challenges was that even then computer literacy rate was still low among Nigerians yet ICT utilisation need some level of literacy. There was fear that some illiterate potential voters could have stayed back home in 2015 to avoid embarrassment from the computerised voting process (Aderounmu, 2018; Ayeni & Esan, 2018; Osita, 2016). This signaled a possibility of technology literacy constraints, which however warranted this research due to lack of accurate evidence about the level of knowhow and election performance implications of the new technology. Previous related scholarly research was mute about that (Adams, 2016; Aderounmu, 2018; Awojobi *et al.*, 2014; Ayeni&Esan, 2018; Iwenwanne, 2017; Muluzi, 2015; Osita, 2016). It was therefore unknown whether such redemptive electoral technology was easily administrable to poll mangers the electorate.

1.2 **Statement of the Problem.**

Nigeria's 2015 elections were in particular lauded for the use of biometric PVCs and SCR machines as well as a peaceful post-election (Sweeney, 2015), but there were still some technology efficiency and electoral performance gaps owing to technology literacy constraints. In areas like Lagos, Bauchi, Enugu, Edo, Kaduna and Niger states, computer literacy rate was believed to low especially among the potential electorate, yet electronic voting technology requires some measure of ICT literacy. There was also no evidence of poll workers' competence in such technology (Aderounmu, 2018; Ayeni & Esan, 2018; Osita, 2016). All such challenges were however unverified as previous reports were silent about the same and how they wrought the very electronic technology Nigeria adopted to correct past electoral wrongs on electoral manual systems. The related literature was also not clear on the consequent level of election performance (Adams, 2016; Aderounmu, 2018; Ayeni & Esan, 2018; Iwenwanne, 2017; Osita, 2016). This research was therefore timely to bridge the knowledge lacuna especially the content, contextual and approach research gaps.

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1.3 General Objective

The general objective of the study was to assess the impact electronic voting literacy on performance of elections in in selected states in Nigeria.

1.4 Specific Objectives

1. To find out the level of administrability of electronic voting technology and its effect on performance of elections in selected states in Nigeria.

2. To examine the level of poll managers' competencies in electronic voting technology and its influence on performance of elections in selected states in Nigeria.

3. To ascertain the level of electorate's knowhow to interface with electronic voting technology and its effect on performance of elections in selected states in Nigeria.

1.5 Research Hypotheses

1. The level of electronic voting administrability does not significantly effect on performance of elections in selected states in Nigeria.

2. Level of poll managers' competencies in electronic voting technology has no significant effect on performance of elections in selected states in Nigeria.

3. The level of electorate knowhow to interface with electronic voting technology has not significant effect performance of elections in selected states in Nigeria.

2. LITERATURE REVIEW

In this section, the review of literature covered the theoretical framework, research model, conceptual framework and previous related literature.

2.1 Theoretical Framework

2.1.1 The Technology Enactment Theory

The study was underpinned by the technology enactment theory (TET) although election computerization can be linked to various theories (Schellong, 2007). The theory formed the research framework used to guide the process of research. TET was advanced and has mainly been propagated by Jane, E. Fountain since early 2000s (Founatain, 2001; 2005; 2014). TET presents a framework whose principle aspect is the distinction between objective Information Technology (IT) and Enacted Technology. Objective IT includes Information and Communication Technology (ICT) elements while enacted technology embodies the use of these elements (Founatain, 2001; Schellong, 2007). Specifically, some of the ICT elements include computer related mechanisms, namely computer hardware, software and the Internet in their original state of functionality. In particular, Enacted Technology involves technology integration dynamics (Founatain, 2005). TET therefore suggests that technology innovation cannot be complete unless there is an interaction between adoption and integration. Adoption may be limited to introducing a technology by providing ICT elements, which is a significant step but not conclusive. This will therefore require integration or utilisation of the elements which however depends on people literacy in the technology or ICT elements (Founatain, 2001; 2005; 2014; Schellong, 2007). On basis of its postulation, TET was relevant to this study because its perspectives of ICT elements could be perceived as the electronic voting systems adopted by Nigeria, while one of the integration dynamic under study was literacy about the technology. The interaction of these perspectives was basis of the conceiving the independent electronic voting variable perceived to influence election performance, as an outcome (Founatain, 2001), the study set out to explain.

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2.1.2 Research Models

There is a range of models related to technology utilisation, but in this study the review centres on the diffusion of innovations model (DOIM) and the motivation model (MM). The MM is very relevant to the concept of study, but the DOIM was the adopted model used to direct research because it offers a comprehensive theoretical scope for exhaustive analysis of the subject of research. According to Taherdoost (2018), DOIM model integrates three major components, namely characteristics of an innovation, adopter characteristics, and innovation decision process. The characteristics of an innovation component involves compatibility and complexity of innovation, while the adopter characteristics cog specifies categories of adopters, namely early adopters, innovators, early majority late majority and laggards. The innovation decision facet features knowledge, and implementation (Sila, 2015). All these conceptual angles the DOIM were very closely useful variable analysis of the current study. innovation characteristics were used to find out electoral implications of technology administrability while the innovation decision and adopter facets was used to examine the implications of technology literacy of poll workers and electorates about Nigeria's electronic voting adopted.

According to the Motivational Model (MM) technology use is determined by intrinsic motivation and extrinsic motivation. Extrinsic motivation involves the extent to which users are inspired to perform an activity perceived instrumental in achieving valued outcomes distinct from the activity itself such electoral credibility. In the case of intrinsic motivation users will want to perform an activity for no apparent reinforcement but the process of performing the activity per-se (Davis, Bagozzi and Warshaw, 1992). Davis et al. (1992) posit that extrinsic motivation can be conceived perceived usefulness of technology while intrinsic motivation may regarded as perceived ease of use. In this study, the ease of use of the main notion coopted for assessing the administrability of the new technology, people literacy levels of the technology and related implications on its perceived usefulness.

2.2 Conceptual Framework

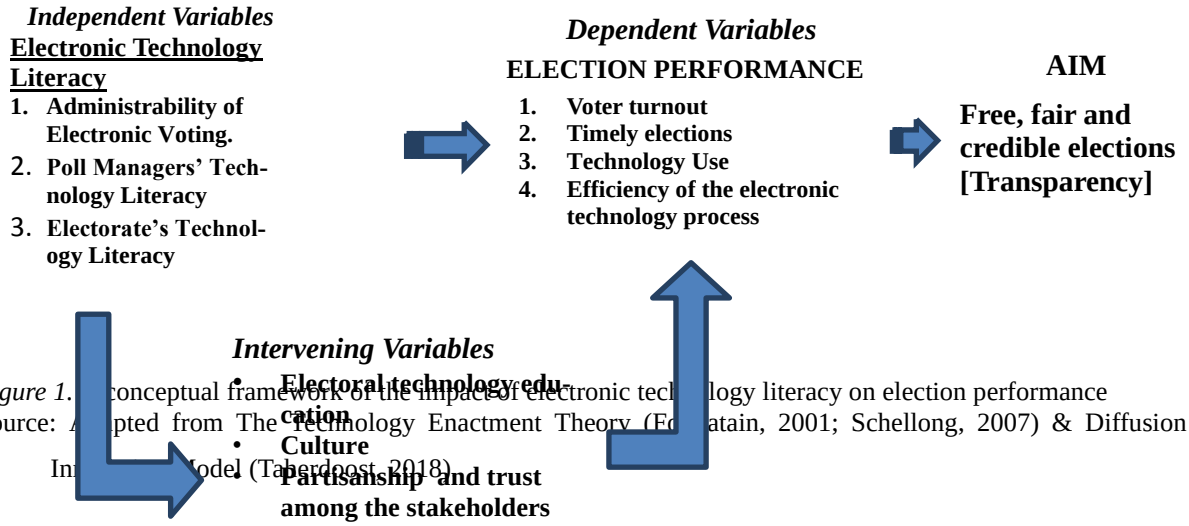


Figure 1. Conceptual framework of the impact of electronic technology literacy on election performance
Source: Adapted from The Technology Enactment Theory (Fountain, 2001; Schellong, 2007) & Diffusion of Innovation Model (Taherdoost, 2018)

2.3 Related Literature Review

In this section, the review of related literature was made along variable associations consistent with specific objectives of the study. The variable relationships included the effects of electronic technology adminstrability, poll workers' technology literacy, electorate's technology literacy and on election performance, respectively. To begin with, a report by Roggemann (2017) on "investments in internet access" specifies that digital literacy programs address the practical

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skills required to access, navigate, and use the internet and internet-enabled devices such as smartphones. Critical digital literacy, according to Gianfranco Polizzi from London School of Economics, aims to empower users to consume content critically by identifying issues of bias, prejudice, misrepresentation and, indeed, trustworthiness. Roggemann (2017) gathered that in highly digitalized societies like Western countries, critical digital literacy goes beyond understanding digital media content, to include knowledge of the wider socio-economic structures within which digital technologies are embedded. Like critical digital literacy, electoral related ICT literacy should go beyond computer applications literacy. It was however not clear whether election managers and adhoc staff in the whole of Nigeria were literate enough to effectively run the adopted e-voting system.

In a previous study by Achieng (2014) titled 'adoption and challenges of electronic voting technologies in South African', the findings suggest that e-voting has raised user competency issues due to the technology complexity involved. Achieng (2014) defines complexity in the context of the study as the degree to which electoral technology innovation is perceived by potential adopters as being relatively difficult to use and understand. It was found out among election managers and volunteers in South Africa that the easier technology is perceived, the greater the potential of adoption and vice versa. E-voting in the country, it was found out, is well administered by the sufficiently ICT literate (Achieng, 2014). Further, Achieng (2014) reports that, to the electorate the difficulty of using the technology was a major concern, especially when it comes to electoral involvement of all citizens regardless of their level of literacy. The findings revealed that electronic enabled elections are difficult to effectively manage and participate in by the ICT-illiterate with no prior knowledge of computerised applications to use on manipulate e-voting technologies with ease. The study reports that people in rural South Africa find e-voting technologies difficult to use especially those that have never used computers before. This observation is about South Africa, but it was also highly suspected in Nigeria, which in that respect remained obscure in existing e-voting literature due to the related knowledge gap.

In Amegnran's (2017) research sought to assess electoral process challenges through poll workers' performance in Togo's April 25, 2015 general elections, poor training is identified as of one of the key findings among deficiencies undermining poll workers' performance. Other challenges noticed include ill-conceived legal framework, lack of infrastructure, personal ineptitude, underfunding, partisanship, and tribalism. Findings further indicate that underperforming poll workers led to long lines of voters, voter suppression, inaccuracies in vote counts, and delay in results announcement. Accordingly, ICT was an impediment to what e-voting can contribute to election credibility. A similar assessment had to be made in Nigeria to cater for approach, contextual and locational research gaps considering that Amegnran's study was only qualitative and that Togo is a different locality with distinct contextuality.

In his keynote Lecture delivered at the 5th Covenant University Conference on e-Governance in Nigeria, Aderounmu (2018) pointed out that poor education is a challenge stalling the advantage of ICT in our electoral culture. It was further noted that **i**lliteracy is still rampant among Nigerians, yet ICT deployment needs some measure of literacy to be effective in the electoral process. And due illiteracy, some Nigerian voters face the risk of being disenfranchised due to the fear that they may not handle ICT tools deployed for election purposes. In relation to the above, Amuzie's (2015) research on electronic voting system and its role in ensuring credible electoral process in Nigeria had specifically observed the need for technical competency to manage the new electoral technology innovation. This, it was found out, is a key leeway to intensively address the discretionary and obscure fuss that had surrounded Nigeria's elections in decades. These were a leading hint of how ICT literacy could be a serious concern in Nigeria. However, there was need for a micro and quantifiable research to address the scope and approach gaps in Professor Aderounmu and Amuzie's presentation.

2.4 Summary

In the literature review above, the technology enactment theory analyzed and adopted as the underpinning theoretical framework used to guide the study. As such, it was adapted for designing the conceptual framework, which was in turn used to illustrate the study variable relationships. This guided the empirical literature review, made according to

the specific research objectives. The empirical review was used to identify research gaps, the main of which included the temporal gap, contextual gap, content research gap, approach gap, specificity gap and locational gap. These gaps were the reason why this study justifiably set out to assess the effects of electronic technology literacy on election performance in selected states in Nigeria.

3. METHODOLOGY

This study adopted three philosophical underpinnings as the research philosophy sought for comprehensive grounded theory used to design a methodology for data collection, analysis and interpretation (Mastin, 2008; Raddon, 2014; Uddin & Hamiduzzaman, 2009). The three philosophical compositions included phenomenological philosophy, positivist philosophy and interpretive philosophy. The study employed an exploratory, descriptive correlational research design based on the quantitative approach (Creswell, 2008; Harwell, 2010; Neuman, 2003; Van der Mescht, 2014). The study population targeted for research consisted of several categories each of which was represented in the study sample of 265 respondents from the six States of study as specified in Table 1. The study sample was determined using the Minimum Sample Procedure (Greene, 2012; Ireda, 2018).

Table 1

Study sample by category

Category	States ($\frac{C\ XS}{N}$)						Total
	Bauchi	Edo	Enugu	Kaduna	Lagos	Niger	
INEC[1]	16	14	15	13	19	17	94
SIEC[2]	16	14	15	13	19	17	94
PP[3] Executives	5	6	6	5	8	5	35
Electoral CS[4]	3	3	3	3	5	4	21
Electorate (Social Groups)	3	3	4	3	4	4	21
Total	43	40	43	37	55	47	265

Source: Researcher (2018)

The sample size in Table 1 was selected using purposive sampling, stratified random sampling and convenience sampling techniques. Eighteen (18) INEC staff and 7 political party executives were selected using purposive sampling and asked to fill interview guides. Other 76 INEC staff and 28 Political Party Executives as well as 94 SIEC staff were selected using stratified random sampling and asked to fill the 5-Likert Scale questionnaire. The rest 21 Electoral Civil Society executives and 21 members of the electorate were selected using convenience sampling. The electorate were represented by community development associations earmarked from across the six States.

The collected raw data was presented, analyzed and interpreted using descriptive and inferential statistics based on the Scientific Package for Social Scientists (SPSS), version 20. The descriptive statistical analysis tools used comprised the arithmetic mean ($\bar{x}$), and standard deviation (S). The inferential statistical analysis tools adopted included Pearson's correlation coefficient and multiple linear regression. In order to accurately interpret descriptions of the research variables and their covariance, respective interpretation scales were adopted for each of the analysis tools. The variables included election performance, electronic technology administrability, poll managers' literacy and electorate's literacy in the electoral technology. The arithmetic mean ($\bar{x}$) was interpreted as: 1 = 'Very low', 2 = 'Low', 3 = 'Moderate', 4 = 'High', 5 = 'Very High' (Kostoulas, 2013). The standard deviation scale indicated that ≥ 1.5=

[1] Independent National Electoral Commission

[2] State Independent Electoral Commission

[3] Civil Society

[4] Political Party

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more spread from the mean and <1.5= closely clustered or less spread around the mean (Bland & Altman, 1996). The Pearson's correlation coefficient scale was that ≤ 0.35= weak correlation; 0.36- 0.67= moderate correlation, 0.68- 0.89 = strong correlations and ≥ 0.9= very strong correlation (Asuero, Sayago, & Gonz´alez, 2006; Taylor, 1990). Statistical significance scale for Pearson's Correlations was $p \leq 0.01$ while for Multiple linear regression, it was $p \leq 0.05$ (SPSS, 20.0).

4. REASECRH RESULTS

The findings of the study were generated from 251 respondents of the initially planned 265 study sample. This represented a 94.7% response rate which according to Babbie (2007) was far above the recommended minimum rate of 70% at which the sample findings are enough to be generalized for the target population. The main findings in this section, were analysed, interpreted and discussed in a way corresponding to specific research objectives. In that case, the dependent variable was described, and its covariance with the independent variables was analysed hypothesis by hypothesis respectively drawn from the same research objectives. All this was however, preceded by findings on the background variables respondents.

4.1 Background of Respondents

Respondents' background was ascertained to authenticate their responses (Kaya, 2013). Only questionnaire respondents (n=192) were profiled considering their perceived average status in the study. Regarding gender, 62.2% of the respondents were male and the rest 37.8% were female. About age, almost half (46.9%) of the respondents were middle aged. Stern (2016) specifies that a middle aged person falls between 35 and 58 years. The rest 53.1% of the respondents were youths but all eligible to vote since they were above 18 years old (INEC, 2018). In terms of level of education, 6.3% of the respondents had a certificate of secondary education (CSE), while only 32.3% had a college diplomas, 37.5% had a bachelor's degree, and 21.4% were holders a master's degree, while 2.6% were PhD holders. None of the respondents had just primary education graduates. Concerning their period of stay (or work) in the States of research, majority (60.2%) of the respondents had been there for over 10 years. Even respondents with at least half a year's experience were conversant enough a reliable comment. For their electoral participation, almost all of respondents (99.7%) were involved in the 2015 elections. The rest had at least participated in a previous election. The profile characteristics above suggest that all respondents under scrutiny could be relied on for the questionnaire survey.

4.2 Description of the Dependent Variable: Election Performance

Performance of elections in each of the six States of study was investigated based on 3 constructs adopted as key electoral success indicators; vote casting success, collation reliability and election credibility. Both statistical and qualitative data were generated on these electoral performance indicators. The statistical findings were presented in Table 2.

Table 2

Descriptive statistics on election performance in selected States of study

Item	N	Mean	Std. Deviation
1. Vote Casting Success ('vtcsts')	192	3.45	1.09
2. Efficacy of vote collation process ('efvtcolp')	192	3.24	1.12
3. Election credibility	192	3.34	1.12
Grand Average Index ('Lvlelperf')	192	3.34	1.11

Source: Field survey (2018)

According to grand average indices ('Lvlelperf') in Table 2, the 2015 general elections in the States of study were rated as largely well performed ($\bar{x}$= 3.36; S= 1.11). This follows a highly rated vote casting ($\bar{x}$= 3.45; S= 1.09), a relatively rated vote collation process ($\bar{x}$= 3.24; S= 1.12) and a highly rated election credibility ($\bar{x}$= 3.34; S= 1.12). These statistics as well as interview and focus group discussion reports suggest that generally the level of performance

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of the 2015 general elections was high in much of Nigeria despite some reservations in some parts of the country. This electoral success could be partly attributed to the technology shift from manual to electronic technology which according to Laverty (2011), was for the first time adopted in 2011 following lingering great concern over electoral quality of Nigeria's past general elections.

Basing on statistics in Table 2 and the recommended rule of thumb (Bulmer, 1979), the average skewness of data on election performance was approximately symmetric ($b_{1=}$ -.381). This suggests that the data was normally distributed and could, according to the skewness principle (Sweet & Grace-Martin, 2003), be applicable to the following inferential analysis of Pearson's correlations and multiple linear regression adopted in this study to verify the research hypotheses.

4.3 Verification of Hypothesis One: Electronic Technology Administrability and Level of Election Performance

Findings in this theme are consistent with research objective one and were used verify the related null hypothesis. To clearly verify the hypothesis, the level of electronic technology administrability, as the implicit independent variable, was first described before inferential analysis could be made about its effect on election performance. The statistical descriptions of the variable were presented in Table 3.

Table 3

Descriptive statistics on the level of administrability of the electronic voting technology

Construct	N	Mean	Std. Deviation
1. Electronic voting require no complex computer knowhow	192	3.20	1.12
2. Electronic voting technology adaptable by poll workers	192	3.20	1.19
Average Index ('AdmeVt')	192	3.20	1.16

Source: Field survey (2018)

In Table 3, the average indices ('AdmeVt') suggest that the administrability of Nigeria's electronic voting technology was moderately rated in much of the states of research ($\bar{x}$= 3.20; s= 1.16). This generates from levels of simplicity of the new technology fairly rated at $\bar{x}$= 3.20; S= 1.12, and the adaptability of the technology also moderately rated at $\bar{x}$= 3.20; S= 1.19. That meant that the level of administrability of the new electoral technology was relative in the States of survey. This was supported by qualitative reports from related interviews and focus group discussions.

With knowledge of the level of electronic technology administrability, Pearson's correlation coefficient and multiple linear regression analyses were made to determine its effect on lection performance in the states of study and Nigeria in general as indicated in Table 4.

Table 4

Correlation and Regression (Model Summary) Coefficients

CORRELATIONS		
		Level of Election Performance
Electronic technology Administrability	Pearson Correlation	.967**
	Sig. (2-tailed)	.000
	N	192

**. Correlation is significant at the 0.01 level (2-tailed).

MULTIPLE LINEAR REGRESSION

CORRELATIONS			
			Level of Election Performance
Model	R	R Square	Adjusted R Square
1	.968a	.936	.936

a. Predictors: (Constant), Electoral voting technology requires computer knowledge and skills, 2. The electronic technology not been difficult to administer among poll workers.

Source: Field survey (2018)

According correlation results in Table 4 statistics r= 0.967**; p<0.001, suggest that there was a linearly significant association (H_A) between levels of electronic technology administrability and 2015 election performance in the States of survey. Regression results in the table show statistic R^2= 0.936. This means e-voting administrability predicted 93.6% elections success in such states. The rest 6.4% (0.064) was predicted by other electronic technology characteristics. It was concluded administrability of the new technology significantly affected election performance not in the States of study but the rest of Nigeria. Null Research Hypothesis One was rejected.

4.4 Verification of Hypothesis Two: Poll managers' Electronic Technology Literacy and Level of Election Performance

In this theme the independent variable about poll workers' technology literacy was also described before its effects on election performance could be determined. The descriptive findings capture the how poll workers were competent in handling the new electoral technology. The statistics registered were summarized in Table 5.

Table 5

Descriptive statistics on the level of Poll managers' technology literacy

Construct	N	Mean	Std. Deviation
1. Poll workers had prior computer application knowledge	192	3.24	1.16
2. e-Election managers well trained about e-voting	192	3.13	1.15
3. Job competency development provided for poll workers vis-à-vis e-Voting	192	3.24	1.12
4. Service delivery of poll workers good enough with the e- voting technology	192	3.14	1.17
Average Index ('Pwkcomp')	192	3.19	1.15

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Source: Field survey (2018)

The average indices ('Pwkcomp') in Table 5 suggest that, poll workers' literacy about electronic voting technology was relatively rated at $\bar{x}$= 3.19; s= 1.15. This transforms from individual descriptive statistics about Poll workers prior computer applications knowledge fairly rated at $\bar{x}$= 3.24; s= 1.16); e-voting training of Poll workers moderately rated at $\bar{x}$= 3.13; s= 1.15; Poll workers' technology competency development rated at $\bar{x}$= 3.24; s= 1.12, and Poll workers' e-supported service delivery also moderately rated at $\bar{x}$= 3.14; s= 1.17. This implies, there level of Poll workers' literacy about Nigeria electronic voting was moderate in the States of survey and the rest of the country.

Having described the level of Poll workers' electronic technology literacy, inferential tools were administered to determine the effect of such technology literacy on election performance. Accordingly, Pearson's correlation and Multiple Regression coefficients were computed as summarised in Table 6.

Table 6
Correlation and Regression (Model Summary) Coefficients

CORRELATIONS		
		Technology Acceptance
Poll workers' technology literacy	Pearson Correlation	.968**
	Sig. (2-tailed)	.000
	N	192
	**. Correlation is significant at the 0.01 level (2-tailed).	

MULTIPLE LINEAR REGRESSION			
Model	R	R Square	Adjusted R Square
1	.971[a]	.943	.942

a. Predictors: (Constant), Poll workers had prior computer application knowledge, e-Election managers well trained about e-voting, Job competency development provided for poll workers vis-à-vis e-Voting, Service delivery of poll workers good enough with the e- voting technology.
Source: Field survey (2018)

According to variable correlations in Table 6, the 2015 election performance in the States studied was linearly significantly associated with Poll workers' electronic technology literacy at r= 0.968; p<0.001. In particular, regression statistic R^2= 0.943 indicates that this kind of e-voting literacy predicted 94.3% success of such elections. The rest 5.7% (0.057) was predicted by other technology adopter characteristics. This deduces that Poll workers' literacy about the new technology significantly affected the 2015 election performance in the States of study and Nigeria in general. In that case, Null Research Hypothesis Two not accepted.**

4.5 Verification of Hypothesis Three: Electorate's Electronic Technology Literacy and Level of Election Performance

This section covers findings that describe the level of Electorate's literacy about Nigeria's recent electronic voting and

inferential statistics about its effect on performance of elections of study. The descriptive statistical results generated were presented in Table 7.

Table 7

Descriptive statistics on Electorate's literacy about Nigeria's electoral technology

Descriptive Statistics		Indices
Mean		3.21
	Upper	3.38
	Lower	3.05
Std. Deviation		1.15
Skewness		-.239

Source: Field survey (2018)

The statistics in Table show, Electorate's literacy about the electronic voting technology was fairly rated at $\bar{x}$= 3.21; *s*= 1.15 in the States of research. This suggests, Nigeria's recent electronic voting technology relatively known and interfaced by the electorate in such States and the country as whole.

This understanding was followed by Pearson's correlation and regression tests administered to determine the effect of such technology literacy on performance of the 2015 election as presented in Table 8.

Table 8

Correlation and Regression (Model Summary) Coefficients

CORRELATIONS		
		Technology Acceptance
Electorate's electronic technology literacy	Pearson Correlation	.963**
	Sig. (2-tailed)	.000
	N	192
	**. Correlation is significant at the 0.01 level (2-tailed).	

MULTIPLE LINEAR REGRESSION			
Model	R	R Square	Adjusted R Square
1	.963[a]	.928	.927

a. Predictors: (Constant), Electorate's Usability of e-Voting Technology.

Source: Field survey (2018)

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Correlation in the table above show that at r= 0.963**; p<0.001 2015 election performance in the States of study was at linearly significantly correlated to Electorate's literacy on Nigeria's electronic voting. Partially statistic R^2= 0.928 indicates that such literacy predicted 92.8% election success. The rest 7.2% (0.072) was predicted by other technology adopted features. It was thus deduced that the knowhow of the Electorate about the new electoral technology significantly affected performance of such elections in the States of research and the rest of Nigeria. As result Null Research Hypothesis Three was rejected.

4.6 Grand Multivariate regression analysis of technology acceptance and election performance

This section covers overall results on how the literacy about the electronic voting technology generally predicted the 2015 election performance in the states of study in Nigeria. The results were generated using a grand multiple linear regression analysis as presented in Table 9.

Table 9

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.969a	.938	.938	.25198

a. Predictors: (Constant), Administrability of e-Voting Technology, Poll workers' competency in the Technology, Electorate's Interface with the Technology

Source: Field survey (2018)

According to statistics in Table 9 at R^2= 0.938, level of literacy about Nigeria's e-voting predicted 93.8% success of elections in such states of research. The rest 6.2% (0.062) could be predicted by other technology dynamics of the country's electronic voting. This infers that increase in poll workers' and electorate's literacy about the new technology propelled election performance, and vice versa, in the States of research and Nigeria at large. Therefore Null Research Hypothesis Three was disapproved.

4.7 The Proposed Model: Jibia's Technology Literacy Model

A results of the research findings above study proposes a new model dubbed, "Jubia's (2019) Technology Literacy Model. The model was designed as presented in Figure 2.

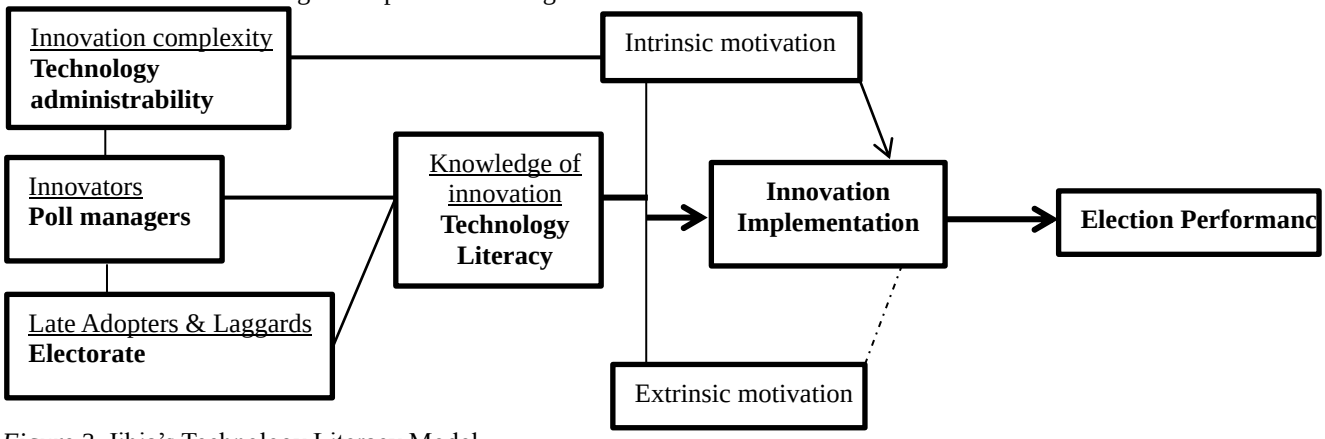


Figure 2. Jibia's Technology Literacy Model

Source: Researcher (2019)

Jubia's model builds on and forms an interplay of the diffusion of innovation (DOIM) model and motivation model (MM) (Davis *et al*., 1992; Taherdoost, 2018). The new model is specific about the postulations of the DOIM and offers more factors and the process that operationalize motivation of technology utilization especially intrinsically. The factors include the three independent variables of technology administrability, Poll workers' and Electorate's literacy while the process is implementation of the electoral technology.

5.5 Summary of Findings

The findings of the study were summarized hypothesis by hypothesis. Regarding null hypothesis one, the study describes the administrability of Nigeria's electronic voting technology as being moderate in much of the country. In particular, it infers that this level of technology administrability significantly affected the 2015 election performance in the country as opposed to the related null hypothesis. In the case of null hypothesis two, the study shows that the level of Poll workers' literacy about the new technology was widely relative in the country and that this also significantly affected performance of the elections of study. This invalidated the related null hypothesis. About null hypothesis three, the study specifies that Electorate's ability to interface with such electoral technology was also fairly rated. It however significantly affected the election result. According to the study, the 2015 election result was credible owing to the levels and forms of technology literacy above.

5.6 Conclusions

It was concluded that each of the factors of technology literacy of study has a significant impact on the performance of an election. Increase in technology administratbility, Poll workers' electronic voting literacy, and Electorate's proficiency to interface with the technology can positively propel election performance in the six States of study, the rest of Nigeria and world.

5.7 Recommendations

In view of the study findings, this study recommended that there was need to simplify further electronic voting and build or maintain competencies of all stakeholders including Poll managers and the electorate so as to boost implementation and electoral success of the technology inn Nigeria. Electoral technology competences should be well sustained or improved through continuous electoral technology education by electoral management institutions like INEC and SIEC and as well as other none state partners such as Electoral Civil Society.

The study also recommended that further research could be done on the following aspects to address perceived knowledge gaps: q) other technology factors affecting election performance; b) performance of elections in other institutional contexts, c) other States of Nigeria or elsewhere in the world and d) the same technology subject after a longer period.

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CIVIL SOCIETY AND THE CHALLENGES OF DEMOCRATIC CONSOLIDATION IN NIGERIA

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Abstract

The role of civil society in popular struggle in Nigeria spans through Nigeria's history beginning from the colonial area to the prolonged area of military era. The study, therefore, examines the roles of civil society towards the entrenchment and democratic consolidation in Nigeria since the

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beginning of present democratic dispensation in 1999. It argues that, the civil society is a platform to harness with both public and private sectors in making sure that government policies on social change is favourable. Using Social Exchange Theory to interrogate the discourse, the study adopts secondary sources of data gathering. It establishes that the independence of civil society is highly imperative for affordable service delivery and continuous impact. It concludes that, civil society is still a veritable tool to checkmate the excesses on the part of the government in ensuring that the dividends of democracy towards the consolidation of democracy in Nigeria is encouraged and sustained. The study, at the end of the discourse, recommends that the civil society should always, through timely press conferences, town hall meetings and several other gatherings, applaud the efforts of the government that focuses on national interest and criticize the government policies that are anti-welfarism.

Keyword: Civil society, Consolidation, Democracy, Government, Politics**.**

INTRODUCTION

Nigeria has vast natural, mineral and human resources that it could exploit to become a great nation. Its resources, growing population, ethnic diversities and rich cultural heritage, if well exploited, with visionary leadership would make the country a force to be reckoned with. However, the country presents a paradox. Since its independence in 1960, Nigeria has been confronted with various political and

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socio-economic challenges. They include: political challenges which have to do with managing elections, promoting national integration, establishing democratic values, curbing corruption and money laundering, ensuring efficiency and effectiveness in the public service sector; intra-state conflict with negative consequences for the polity; the Niger-Delta crisis; inequality – the widening gap between the rich and the poor; the issue of providing for the needs of its growing population and addressing unemployment, poverty, dearth of infrastructures and basic social facilities, among others (AU.APRM, 2009).

Retrospectively, colonial rule and its attendant harsh economic conditions imposed on the people by the colonial state was what led to the rise of civil society activism in Nigeria. Colonialism made civil society particularly, labour, professional, women, and student organizations, and the media so active in the politics of the colonial era. Particularly, repressive colonial policies –forced labour, dispossession and commercialization of peasants' lands, increased taxation including on women, and urban-biased development became sources of local resistance which significantly helped to nurture and strengthen civil society organizations in Nigeria (Mgba, 2015:183).

With this development, the governments became suspicious, intolerant and began to infiltrate, politicize, compromise, circumscribe and harass the civil society (Ikelegbe, 2013: 34). Despite the resistance experienced by these civil society organizations, they continued in their struggle for greater good of the greatest number of Nigerians even under military regimes that were known for their outright disregard for democratic principles and human right abuses, just as Mgba (2015: 185) puts it:

> Organized labour's role in popular struggle in Nigeria spans through Nigeria's history beginning from the Colonial era, to the prolonged period of military rule, and to the contemporary time of globalization.

Perhaps, it is in view of this that, Ranchod (2007) argues that CSOs could play a "watchdog" role over state actions spending and legislation". According to Foely and Edwards (1998:5), civil society is identified as an effort to rethink the bases of social order, placing it as a realm of politics situated between the state and citizenry or put otherwise, between government and those governed.

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It is on record that May 29, 1999 marks a watershed in the political history of Nigeria. On that day, the country transited into civil rule after 15years of unmitigated military dictatorship.Prior to the transfer of power, Nigeria went through three transition programmes which lasted for thirteen years. These were the transition programmes of General Ibrahim Babangida (1985-1993), General Sani Abacha (1993-1998), and General Abdulsalami Abubakar (1998–1999). With the advent of democracy since 1999 (termed as the Fourth Republic), one of the core objectives of civil society organizations have been a realistic consideration of democracy and its ideals. Indeed, consolidating or deepening democracy helps in "strengthening people's ability to hold public servants accountable for their actions and fostering democratic change by expanding social pluralism" (Marcussan, 1996:406 quoted in Allen, 1997:336). Nigeria's return to democratic rule was greeted with high hopes and expectations by the citizenry. Among the multiple expectations of the Nigerian people, two of them were salient. First, there were hopes that post-military dictatorship era would usher in a responsive and accountable political leadership that would be a radical departure from the authoritarianism that Nigerians were subjected to for one and a half decades. Secondly, the Nigerian people nursed the hope that democratic rule would bring about a marked improvement in their material condition (Oyediran, 1995). The active role played by civil society organization is unimaginably crucial. The various organizations that constituted the civil society were formed around some definite sets of interests, which border on issues of ethnicity, religion, gender, professionalism and a list of other determinants.

Thus, civil society has been emphasized in new democracy experiencing "democratic rollback" (Diamond, 2008), with a view to "deepening" or consolidating the process, that is, embedding democracy in a society such that "the likelihood of democratic reversal or even destabilization … is remote" (Heller, 2009:124). This is because, civil society is indispensible for democracy, so much so that one of the best ways to achieve democratization is to strengthen civil society (Gifford, 2000:495). Without mincing words, civil society groups are fundamentally "Conciliator Organisations" such as professional associations, religious groups, labour unions, citizen advocacy organizations where individualist like minds gather to promote their common good and enrich public

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participation in the entrenchment and sustenance of democratic culture. As a matter of fact, democracy requires a vibrant and autonomous civil society and an effective state capable of balancing the demands of different interest groups (Mercer, 2007:7).

However, there has never been a time in the history of Nigeria that the role of civil society organisations has come under much scrutiny than within the past 20 years of uninterrupted democracy. Civil society organizations have been widely recognized as an essential third sector that serves as a bridge between the state and the private sphere and work to seek the greatest good for the greatest number of the people. Civil society is therefore seen as an increasingly important agent for promoting good governance like transparency, effectiveness, openness, responsiveness and accountability (Ghans – Pasha, 2005:3). In other words, civil society is neither an arm of government nor institution of the state. It operates independently of government in pursuit of collective interest. It neither makes law, executes law, interprets law nor holds or control funds, yet it is one of the most powerful institutions for change. It is the watchdog of the people and has the capacity to mobilize citizens into a movement, build support across stakeholders and also bring credibility to the political system in promoting transparency, accountability and confidence in governance.

In short, civil society is a vehicle vital for social, economic, religious and political development activities of the state as developing societies like Nigeria depend on the effectiveness and efficiency of its civil society (Omade & Bakare, 2014). Therefore, the main focus of the study is to recapitulate into the factors that led to the formation of civil society organizations in Nigeria, examines their fundamental contributions to the enthronement of democracy in Nigeria, assess their challenges in democratic consolidation in Nigeria and possibly suggest ways through which the performance of civil society organizations can be improved, within the context of sustainable democracy.

Understanding Civil Society

Definitional issues revolve around the scope of civil society - does it include organizations and associations which are not always voluntary, such as churches or religious sects, and does it include political parties and trade unions, or should the term be confined to voluntary activist movements?

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The main conceptual issue is the surprised link between civil society and democracy, whether civil society is viewed as "the cornerstone of democracy" (Castells, 2008:78), with civil society seen as providing "the impetus for establishing elections, as well as the leadership and resources for political parties contesting these elections" (Holm et al, 1996:43). Thus, a definitional concern when looking at civil society organizations centres on delineating civil society groups in terms of whether they participate in social or political activism. This sphere is separate from the state and the market. Civil society is thus usually defined in relation to the state (Bayart, cited by Okuku, 2002:82-83); that is, the way society is organized outside the state, meaning 'the set of voluntary organizations and groups not created by the state' (Belloni, 2008:182). Nevertheless, much of civil society work is geared toward complementing state or government efforts.

The civil society sphere, which has a long history in political thought is sometimes referred to as the "Third Sector". But as movement or organization, in the form of CSOs, Civil Society refers to:

> Citizen initiatives, associations, and movements (which) have increasingly oriented themselves toward the defense and expansion of a variously described societal realm, the forms and projects of which are clearly distinguished from statism (Cohen & Arato, 1994:30).

In spite of its common usage in social and academic discourse, civil society 'resists easy definition, especially when discussing it as a global development' (Barnes, 2007:11). Generally, civil society is considered to encompass all spheres of organized societal activities located outside the realm of active politics. Proponents of this schools of thoughts distinguish the civil society from the political society – the domain of government institutions and political parties. Others view civil society as the society itself, whether organized or not, as long as it is different from the sphere of active politics. Whatever perspective one may prefer, there is an agreement that civil society has tremendously grown in strength and prominence in Africa in the last there decades. It is also widely accepted that groups making up civil society differ significantly in terms of their membership, goals, size, level of professionalism and impact on policy processes and social transformation (Koko, 2016:114).

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However, there is a continuum between these forms of activism, and groups may act differently at different times. One would normally associate political activism with party politics and civil society groups befitting the "political activist" tag would be those aligned to political parties or political causes, such as challenging the form of government or demanding human rights. In the same vein, groups identified as 'social activists' would probably be 'non-aligned' to party politics, and focusing on/advocating a range of causes that may include equal access to housing and water, the environment, access to medical facilities, minority rights, etc. The distinction between the two types of activism is generally based on where activism is targeted, with political activism conceptualized as activity targeting the state and political reform (Yang, 2009), whereas social activism might seek to change society.

Following largely from liberal thinking, civil society is conceived as an arena independent from the state (political influence) and market (economic influences) where individuals forge associational ties in pursuit of their interests (Tar, 2009:24). It refers to non-state and non-market forms of voluntary associations that are governed by communicative practices" (Hellner, 2009:124). Similarly, Thomson (2010:5) defines civil society as the organizations that arise out of voluntary association within society, found between the extended family and the state. Included in this group are professional organizations, labour unions, trade associations, women's groups, church assemblies, businesses, special interest companies, community groups, and so on, right down to sports and social clubs. Thus, civil society is viewed as an aggregate of institutions and bodies acting as an intermediary between the family and the state, its life is defined by distinctiveness and relative independence from the state and its objectives are essentially civil and public, while its activities are underlined by claims, contestations and popular struggles (Ikelegbe, 2001).

In all its forms, civil society is an appropriate locus of enquiry in a number of regards. Foremost, it is the social arena in which associative life is shaped by norms, practices and beliefs attached to faith. In the content of the discourse, what is important to note is that civil society is a contested and sometimes an ideological concept used in referring to social forces or groups that are independent of the state (Hearn, 2001).

Theoretical Perspectives

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The theoretical framework adopted in the course of this study is the Theory of the State. Nigeria as a socio-economic and political formation is constituted by the state and the civil society, both of which are organically and dialectically related. In the first instance, each cannot be properly understood except in direct reference to the other. Secondly, in a fundamental sense, and more so under the country's perennial military dispensations, the sate increasingly poses a sharp contradictions to the civil society. An understanding of the nature and role of the Nigerian civil society in democracy thus requires some insights into the structure and dynamics of the Nigerian state. In fact, the origin of the state is hotly contested; for Hegel, it is the objective concretization of the dialectics of Reason or Spirit ; for Weber, it is resultant of subjective obedience to various bases of legitimacy – traditional, charismatic and legal-rational; for contract theorists, the state arises from social contract between rulers and the ruled: while for some elitist theorists, the state is based on the superior political leadership qualities of state managers (Eteng, 1996:2). The functions of the state are also contradictorily posed. Thus, for some, its main objective is the maintenance of law and order while for others, it includes the promotion of general welfare, and its operation as a kind of clearing house for differing and competing interest groups in society. The scope of its functions has equally varied according to the conceptual whims of the analyst, being rather general and broad for some, or more restricted and limited for others, even as the state functions only as a part of the social order (Wilson & Kolb, 1949:517; Ballard, 1939:254).

Besides, the state is equally functionally distinguished from the government-in-office. Ballard (1939:233-4) thus sees the government as the mechanism through which the state acts, while Williams (1951:202) argues that the government is the structure by which the group's activity is controlled and regulated. The state, for Plato, as for Aristotle, existed for the purpose of seeking common good and moral perfection. To them, the state was not merely a political association but also served as a religious community and a socializing agency (Moten & Islam, 2011:71). Meanwhile, beginning with Niccolo Machiaveli (1946 – 1527 c.t), the emphasis and assumptions changed. Theorists now viewed the man as a self-interested creature who has a "perpetual and restless desire for power after power that ceases only in death" (Hobbes, 1968:161). Consequently, the focus has shifted from morality and virtue to power and authority. This is true for Karl Marx (1818 -1883) and for Max Weber (1864-1920), both of whom influenced the contemporary theorists of state.

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Both Marx and Weber assumed population, territory, government and sovereignty as self-evident features of the state needing no elaboration. Hence, they proceeded to a class or group analysis of the state and its behavior. For Marx, the state is the product of class contradictions and class struggle and is controlled by the economically dominant class (Pierson, 1996). To Weber, the state is a "human community that (successfully) claims the monopoly of the legitimate use of physical violence in a given territory (Weber, 1970:78). In addition, Dahl (1961), influenced by Weber, viewed the state as a collection of individuals occupying role positions (those of governing authority) and acting as a group to govern (Dahl, 1961). It is in view of this that GIddens (1985:20) defines a state as "a political organization whose rule is territorially ordered and which is able to mobilize the means of violence to sustain that rule.

The relevance of this theory lies in the fact that, civil society is the sphere of organized social life, association and professional solidarity, activism and engagement with the agencies of the state for social transformation (Shaw, 1994:647). It is not only distinction from the state but also in conflict with it (Heller, 2009:126). Ideologically, civil society is necessarily opposed to the state, not simply in the sense of confronting authoritarian regimes, but also primarily in the sense of constraining the scope and action of the state (Allen, 1997:331-335). From the Marxist's view, civil society is largely a contested space that reflect the struggles within wider society especially between the state and exploited classes (Mercer, 2002). The Marxist view of civil society popularized by Gramsci (1978:12) sees civil society as "a domain in which existing social order is grounded …… and a realm in which new social order can be founded… and an intellectual tool for fermenting change" (Cox, 1999:4-5). Civil society to Gramsci is an "ensembly of private groups" that challenges the coercive power of the state as an emancipatory instrument for the exploited classes and groups (Gramsci, 1978:12; Herbert, 2012:239-240).It is within this context that Hegel (1964:48) holds that civil society is contradictory construct, which is in continuous conflict with the state. None of the two concepts can be romanticized as they always tangle. He, however, opines that the state is a formation that encapsulates universal interests, which in turn contains and prevents particular interests in the civil society from exploding.

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To corroborate this, Marx (1964:49) theory also holds that the set of contradictions that obtain in the civil society are also reproduced in the state formation, almost simultaneously. This happens in such a way that the state promotes some set of interests in the civil society, while it at the same time undermine other interests. This view agrees with Marx's position that the civil society and the state are not entirely independent of one another, rather they criss-cross at various arenas (Cammack, 1989). It is also important to note that Karl Marx's position about the civil society coincides with his view of the economic substratum in the capitalist system. In fact, he sees the capitalist society as a logical product or epi-phenomenon of the civil society (Abutudu, 1995:3). In other words, while Hegel is of the view that the civil society consists of numerous and conflicting interactive private interests which are counteracted by the state, Karl Marx views civil society as a product of history, shaped by the perpetual conflict which arises as a result of unequal access to means and products of production. Thus, civil society is an essentially participatory, broad-based and self-governing formation engaged in shaping public affairs, public policy and governance. It is a formation that is voluntarily constituted, non-state, fairly autonomous, largely self-generating and self-supporting, and is conceived with civil and public purposes. Civil society is the private realm of the citizenry, in juxtaposition with the state and corporate realm (Diamond, 1994; Ikelegbe, 2005:243, Thomson, 2010:5). It is the associational life that allows for development of social capital/trust which binds members together and motivates them to act collectively whenever their group interest is threatened by forces opposed to them (Fukuyama, 2001; Haynes, 1997).

The Emergence of Civil Society in Nigeria's Political Space

Colonial rule, especially its attendant harsh economic conditions imposed on the people by the colonial state was the initial basis for civil society activism in Nigeria. Colonialism made civil society particularly labour, professional women and student organizations, and the media active in the politics of the colonial era. Repressive colonial policies – forced labour, dispossession and commercialization of peasants' lands, increased taxation including on women, and urban-biased development became sources of local resistance which helped in no small measure to nurture and strengthen civil society organizations in Nigeria. As a matter of historical fact, the rise of labour

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struggles and, indeed, other associational entities, is closely rooted in the process of colonial conquest, dependent capitalist and class formation (Tar, 2009: 89). In an overview of the historic struggles of civil society in Nigeria, Ibrahim (2003:29) clearly established:

> The dynamism of trade, professional and students unions in Nigeria is one of the clearest signs of the democratic drive embedded in its civil society. For example, Nigerian students have played a very significant role since 1934 when they established the Lagos Youth Movement (LYM), the core on which the first nationalist party, the National Council of Nigeria Citizens (NCNC) was built. In the post war years, the West African Students' Union (WASU) played a galvanizing role in the independence movements ….. Nigerian students have continued to play a significant role in the country's democratic struggles.

To corroborate this assertion, in actual fact, imaging the active role and impact of civil society in Nigeria prior to independence, Thomson (2010: 276) interestingly posits that:

> It had been civil society that actually overthrown the colonial state. Associational activity … trade unions, professional societies and community organizations had all contributed to make the nationalist movement the powerful forces that they were.

Apparently, the struggle by civil society in Nigeria for democracy clearly predates the upheavals in Eastern Europe and third wave of democracy in the 1980s and 1990s. The struggle for popular empowerment had been a continuing phenomenon since the immediate independence years (Bradley, 2005; I-IDEA, 2000: 199-201). And, the struggle of Nigeria's popular civil society organizations is influenced and engendered by the exploitative, hegemonic and dominant character of the state (Osiki, 2009: 156; Tar, 2009). In other words, civil society organizations have an age long connection with struggle for democratization in Nigeria (Igbokwe-Ibeto et. al, 2014). The historic

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antecedents of today's civil society organizations can be traced back in time to the pre-colonial and nationalist eras.

However, civil society existed in pre-colonial traditional states in Nigeria as associational forms that gave rise to participation, communication, information flow and influence between the citizens and the state, as well as means of social economic assistance, control of social existence and survival of citizens (Chazan, 1996; Ikelegbe, 2003). With the advent of colonialism, however, new social exchanges, modernism and attendant social dislocations provided a new platform of consciousness and agitation which accelerated the formation of communal, traditional, cultural and other groups (Ikelegbe, 2013). The nationalist movement and decolonization also provided the stimulants for associational blossoming. Consequently, the decolonization period is regarded as the springboard of modern day civil society (Young, 1992:37). According to Igbokwe-Ibeto et al (2014:6), several associational groups in the colonial era sought to restrain the colonial administration from enforcing unpopular laws like the imposition of taxes on some products. The Agbekoya revolt and the Aba Women Riot in the Western and Eastern Regions of Nigeria respectively, were some of these activities of civil society. Though, crude and unorganized as some may see it, these organizations were at the vanguard of ensuring equality and equity with the dictates of law. In other words, the consciousness to challenge an oppressive government or policies considered to be autocratic is not a new phenomenon in Nigeria. It is in view of this that Ekeh (1994) argues that:

> The structures and processes that are currently labeled civil society are not new. Historians and social scientists in the pre-1985 period used other concepts and terms to designate phenomenon that this fresh construct of civil society now claims for its domain.

Specifically, CIVICUS (2007) describes certain typologies of civil society organizations in Nigeria as follows: Professional Associations, Labour and students Groups which include: the Nigeria Bar Association (NBA), the Nigerian Medical Association (NMA), Nigerian Society of Engineers (NSE), the Academic Staff Union of Universities (ASUU), the Nigerian Labour Congress (NLC),

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and so forth. The Human Rights and Pro-Democracy Groups such as the Civil Liberties Organisations (CLO),Committee for the Defense of Human Rights (CDHR), Constitutional Rights Project (CRP), and the League for Human Rights(LHR); Primordial Groups such as the *Jama'atuNasril Islam* (JNI), Federation of Muslim Women of Nigeria (FOMWAN), and the Christian Association of Nigeria (CAN), among others. Undoubtedly, Nigeria has rich associational life, which defines the pluralistic and structurally associated terrain of civil society in Nigeria. The multiplicity of CSOs certainly makes their categorization or grouping cumbersome. However, Abutudu's (1995) and Diamond's (1994) classifications of CSOs can be very useful in classifying CSOs in Nigeria. Abutudu (1995), identified five classes of CSOs, namely: (i) professional associations, labour and students, (ii) human rights groups; (iii) primordial groups; (iv) business class; and (v) voluntary mutual support groups. By using goals and membership, Diamond (1994) classified CSOs in seven groups. These are; (i) economic (productive and commercial associations and networks); (ii) cultural (religious, communal and ethnic associations; (iii) informational and educational (organizations dedicated to the production and circulation of ideas and information); (iv) interest – based (designed to advance the interests of workers, professionals, etc); (v) development (NGOs and self-help groups; (vi) issue –oriented (movements for environmental protection, women's rights, etc); and (vii) civic (aimed at strengthening the political system and imparting democratic values).

The classification by Abutudu (1995) and Diamond (1994) only point to the fact that no single classification of CSOs can capture their essence and structural differentiation. Notable civil society groups, which are at the forefront of pro-democracy campaigns, judicial issues and the prevention of human rights abuses and extra – judicial murders includes: National Democratic Coalition (NADECO), United Action for Democracy, JACON, Civil Liberties Organisation (CLO), Democratic Alternative, Constitutional Rights Project (CRP), Campaign for Democracy (CD), Human Rights Africa (HRA), Universal Defenders of Democracy and Committee for Defence of Human Rights (CDHR). The establishment of these pro-democracy and human rights groups resulted in an unprecedented level of opposition to the intended transformation of the former military heads of state (General Babangida and late General Abacha) to civilian presidents and the heightening cases of human rights abuse and extra-judicial murders (Ajakaiye, Adesanya & Roberts,

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2002:274). Noticeably, there are some professional bodies of civil society organizations. These are: Academic Staff Union of Universities (ASUU), Non-Academic Staff Union of Universities (NASU), National Association of Nigerian Nurses and Midwives (NANNM), Nigerian Bar Association (NBA), Nigerian Medical Association (NMA), Nigerian Labour Congress (NLC), Manufacturers Association of Nigeria (MAN), National Association of Chambers of Commerce, Industries, Mines and Agriculture (NACCIMA), Nigeria Employers Consultative Association (NECA), Nigerian Union of Journalists (NUJ), National Union of Petroleum and Natural Gas (NUPENG) Workers, Petroleum and Natural Gas Senior Association of Nigeria (PENGASSAN); National Association of Nigerian Students (NANS) and so on are professional associations, trade or labour unions and students' bodies (Obasanjo&Mabogunje, 1992; Abutudu, 1995; Lewis, et al, 1998). These CSOs play advocacy and dissemination role in the area of constitutional and political reform to strengthen constitutional or limited rule, founded on the rule of law, pluralism, competitive party and electoral politics, promotion and protection of human rights and the war against corruption (Jinadu, 2013:74).

The conjuncture of the late 1980s activated civil society in Nigeria. Government, hitherto, unaccountable and despotic became even more authoritarian as they embarked upon unpopular belt – tightening programmes. The abuse of office, executive lawlessness and reckless political decisions became the order of the day as the state became the private property of those who ruled Nigeria. From the end of the civilian rule in 1983, through to the Babangida and Abacha regimes, the excesses of government continued to grow, activating a civil society determined to check the erosition of rights, freedoms and civic values. Thus, the conjuncture was also characterized by intense restlessness among citizens and civil groups, which demanded democracy, participation and justice, and sought compensation for the deficiencies in state welfare through alternative social provisioning. New forms of civil organization emerged n this context and new sets of policy platforms and issues were developed (I-IDEA, 2001:200-201). However, the introduction of Structural Adjustment Programme (SAP) into the political economy of Nigeria, and the elastic transition programme of the Babangida administration, provoked the emergence of the "NGO industry" (Alemika, 2003) with diverse areas of interest such as democratization, gender, human rights, poverty, conflict management, environmental and health. Some hitherto conservative professional

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bodies were also transformed into militant groups by the exigencies of the market logic and transition programme (Animashaun, 2008:27). While authoritarianism inhered in the different modes of accumulation that existed before the introduction of SAP, the implementation of the policy components of SAP expanded the totalizing and authoritarian thrusts of the state (Gana, 2000).

The major policy components of SAP included the formal introduction of the second tier foreign exchange market (SFEM); removal of petroleum subsidy, privatization and commercialization of state enterprises, wide-ranging introduction of deregulation; removal of controls in profit repatriation to stimulate foreign investment, and reduction of public expenditure etc (Kukah, 2003). Apparently, the Structural adjustment basically led to the disengagement of the state from economic production (parastatals), leading to a worsening of the financial conditions of the people. There are two important things to note about civil society intervention under SAP. First, government's gradual withdrawal from economic production and social provisioning led to the emergence of civil society particularly community-based organizations (CBOs) as alternative sites of economic production and social service delivery. Secondly, the authoritarian context within which SAP was implemented and the negative consequences of its implementation on the material conditions of the citizenry pitched civil society organizations in a deadly confrontation with the state (Animashaun, 2008: 27).

It is interesting to note that, since May 1999, when the Obasanjo civilian administration came to power, wives of the president, vice-President, state governors and other influential people in society have set up various pet projects and NGOs. These include Stella Obasanjo's Child Care Trust, Titilayo Abubakar's Women Trafficking and Child Labour Eradication Foundation (WOTCLEF), and Remi Tinubu's New Era Foundation for disabled and displaced persons. Other pet projects include Royal Advancement for Development; Health is Wealth, Youth Empowerment Scheme, Rural Empowerment Accelerated Programme started by the wives of the governors of Ogun, Oyo, Niger and Adamawa states, respectively (Ajayi, 2001:18). So far, in Nigeria, particularly since the return of civil rule in 1999, the number of registered civil society organization is estimated to be over 500,000 (Chukwuma, 2005:3).

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Studies have shown that the role of civil society is very indispensible for national development. It is not anti-government as may be perceived in some quarters. Clinton (2012) was of the view that civil society is not a threat but an asset. In a critical evaluation of the role of civil society organization in a democratic setting, Diamond (1999) asserts that:

> It provides the basis for the limitation of state power for the control of state by society and thus for democratic political institution as the most effective means of exercising that control; it supplement the role of political parties in stimulating political participation, increasing the political efficacy and skills of citizens, promoting an appreciation of the obligations and rights of democratic citizenship, it promotes civic awareness through the civic education for democracy; it disseminates information widely and so empowers citizens in the collective pursuit and defense of their interests and values through the enhancement of inclusiveness, responsiveness, accountability, etc.

In Nigeria, the activities of CSOs touches on different aspects of the nations life ranging from politics to the economy, religion, social life, among others. CSOs such as the Civil Liberties Organisation (CLO), Save Nigeria Group and National Democratic Coalition (NADECO0 are focused on political processes while development NGOs such as the Justice, Development and Peace Commission (JDPC) of the Catholic Mission in Nigeria, are also concerned with eradicating poverty, reducing unemployment and public enlightenment. There are other CSOs such as the Entrepreneurial Development Initiative (NDIP), providing vocational skills training and empowerment for the unemployed youth in the Niger Delta Region. Unlike in some African countries where CSOs in Nigeria represent the bridge between the government and the ordinary people. Their views are usually respected because they are considered to be non-partisan (Jiboku & Jiboku, 2017:169). Indeed, the activities of trade unions or labour movement under the umbrella of the Nigeria Labour Congress (NLC) in coalition with other civil society groups including pro-democracy and human rights groups during military dictatorship of the late 1980s and the 1990s hastened the return to democratic rule in the country in 1999 (Adejumobi, 1999; Adetula, 2011:10; Bradley, 2005; Yusuf,

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2009:151-160). According to Ojo (2011), many of the civil society groups like the Campaign for Democracy (CD), Save Nigeria Group (SNG), Civil Liberties Organizations (CLO), Committee for the Defence of Human Rights (CDHR), Transition Monitoring Group (TMG), etc, were instrumental in the restoration of civil rule.

Undeniably, these groups in collaboration with the Nigerian Labour Congress (NLC) fought the Nigerian military administration to a standstill. They mobilized students and workers for civil disobedience, strikes and protest marches across the nation. Many in their ranks were killed and maimed, while some lucky few were able to make good their escape into exile (Ojo, 2011). Of significance are chains of reactions that trailed the introduction of the economic policy (Structural Adjustment Programme) of the then Babangida's administration.

The advocacy of these organizations was against the "conditionalities" of the IMF (including privatization of state public utilities, deregulation and/or de-subsidization, down-sizing of public institutions, and devaluation of the naira) during the so-called 1986 national "debate". The critique of state policies of SAP by organized labour and civil society bodies was very vociferous and it hinged fundamentally on not only the "imposed hardship" of the policies on the livelihood of labour and its affiliate unions, women and impoverished Nigerians but also its erosion of national sovereignty. This resulted to an unprecedented wave of labour and popular repression by the Nigeria state (Adesina, 2000:144; Ikelegbe, 2001:8). The implementation of SAP led to political repression and exclusion which further expanded the social gulf between the state and civil society. The deleterious impact of SAP on the material status of the people propelled civil society organizations not only to stage mass protests and organize civil disobedience against the state but also to canvass for the democratization of the social space (Momoh & Seteolu, 2006). All the established and duly registered associations and groups fought gallantly against SAP and enthronement of democratic norms recorded many important gains, both quantifiable and non-quantifiable.

Emphasizing the civil society organisations' contributions to the fight against Structural Adjustment Programme (SAP) initiative, Jega (2000:32) vividly underscores that:

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> At the initial stages of the implementation of SAP, some organized civil society groups, notably labour movement, the students, and professional, were able to mobilize using brands of nationalists, patriotic and class-based identities …… university students organized under their national association, NANS, to agitate for collective demands and to oppose state education and other economic policies perceived as detrimental to the Nigerian people. Similarly, workers under the Nigeria Labour Congress (NLC) to advance collective economic and political interests, while professionals such as lawyers and university lecturers, under Nigeria Bar Association (NBA) and the Academic Staff Union of Universities (ASUU), respectively struggled, agitated against, or otherwise impacted upon state policies.

In specific terms, Yau (2015) identifies six areas in which the CSOs in Nigeria have played a significant role that resulted in the good conduct of the elections. These are: One, the setting up of the agenda for electoral reform through sustained advocacy; two, observation of the preparatory stages of the election; three, working with the INEC to provide constant oversight of the electoral umpire; four, voter education and sensitization campaign for peaceful election; five safeguarding the Independence of the Election Management Body (EMB); six, the role of political parties in the actual observation of election and their deployment of various election monitoring mechanisms. In view of this, it could be boldly argued that the Civil Society Organizations had played vital roles in the enthronement of democracy as well as the consolidation of democracy in Nigeria. Related to this, Saliu and Muhammed (2007:538) examined the contribution of civil society organizations in recent memory:

> First is the fight against authoritarianism which was consequent upon the "third term agenda". The third term agenda was an idea initiated by the then president of the Federal Republic of Nigeria, Olusegun Obasanjo, to elongate his tenure by another, an extra term. The covert controversial move by Obasnajo angered a cross-section of Nigerians

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> and especially antagonists of the third term bid across the country. The prominent actors who participated in the struggle included the then Vice-President, Atiku Abubakar, some members of the PDP, other political parties and civil society organizations.

Describing the contributions of these actors towards an outright abuse of power by the then incumbent president Olusegun Obasanjo, the Vanguard Newspaper of January 5, 2006 observes that:

> The National Civil Society Coalition Against Third Term (NACATT), Bamidele Aturu, the Steering Committee Chairman of NACATT, challenged president Obasanjo that the "third term agenda" is immoral, corrupt, divisive, insulting , an evident of failure, capable of creating a political uncertainty and, of course, it is unconstitutional

Other civil society organizations that participated in this protest against authoritarian leadership of president Obasanjo were: Peoples Problems and Solutions (PPS) Organization, Catholic Bishops Conference of Nigeria and individuals like Prof. Wole Soyinka, former governors and factional chairman of the Alliance for Democracy (AD), Chief Bisi Akande, Prof. Ropo Sekoni, Dr. Joseph Oladokun, Solomon Olufelo and Adeola Odusanya, among others. The persistent agitation and protests by the civil society groups culminated into the resolution of the legislative arm of the government on Wednesday May, 16, 2006 to strike out, in its entirely, a bill seeking 116 amendment/alterations of the 1999 Constitution of Nigeria which sought a three-term maximum of four years each for the president and the Governors as opposed to a two-term of four each stipulated by the constitution.

In Nigeria's political scene, the Third Term Agenda of former President Olusegun Obasanjo was resisted vehemently by CSOs such as National Civil Society Coalition Against Third Term (NACATT) led by the late Mr. Bamidele Aturu and used by the media extensively to campaign against the bid. In addition, religious organizations and individuals were also mobilized against the idea which eventually encouraged the Nigerian Senate to jettison the bill that would have given

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a legal backing to the Third Term bid. What happened was that the public campaign turned the issue into a national embarrassment for the law makers (Omede & Bakara, 2014).

Another fundamental role played by the civil society organization is the fight for the passage of Freedom of Information Act in entrenching transparency in the government of the day. According to Omode and Bakare (2014), the Freedom of Information Act is a law that stipulated that all institutions spending public funds will have to be open about their operations and expenditure while citizens will have the right to access information about such activities. However, due to personal elitist reasons, the machineries responsible for passing the bill slowed down the process and it took a very long time (over a decade) before the desired result was achieved. The result that was achieved is chiefly attributed to the relentless efforts of the coalition of Nigeria civil society groups who have long worked and advocated for the passage of the F.O.I Bill under the leadership of the Right to know Movement, Media Rights Agenda (MRA) and the Open Society Justice Initiative. Commenting on the success described, Edetaen (2011:112) succinctly affirms that:

> The signing of the F.O.I Bill into law is the clearest demonstration ever, of the power of civil society working together to influence public policy and initiate reform in making government work for the people.

To buttress this further, The Civil Society Organizations (CSOs) played important roles in terms of voter education and election monitoring , just as it was demanded of them by quite a number of opinion minds (Uya, 2000). Without mincing words, civil society groups are critical stakeholders in the Nigerian electoral process, they were, however, able to record only moderate success in curbing election related violence in the 2007 elections. This was because there was very limited opportunity for civil society to participate meaningfully in the electoral process in Nigeria, for instance, civil society does not command much respect among other stakeholders on the electoral process especially the political parties. Also, activities of CSOs are more often not organized to make specific demands.

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In short, drawing on the country's long history of a political vibrant civil society, Nigerian CSOs have been building on this history, since 1999, to nurture and strengthen multi-stakeholders' pro-democracy coalitions and networks in state and society to sustain and reinforce its watchdog role in electoral governance in the country. However, playing the role has underscored serious capacity deficits that have constrained the effectiveness, particularly of the oversight role of CSOs. The dynamics and the consequential contradictions of state-society relations in the country, structured and underlined by the salience of its rentier political economy, for example, ethnicity, religion, the urban-rural divide, clientelist patronage, corruption, and federalism, raise questions about the co-optation of various CSOs into the country's partisan politics and mainstream political culture, in a manner that not only dissociates them from civil society itself, but also privileges them (Jihadu, 2013:72).

Civil Society Organizations and The Challenge of Democratic Consolidation in Nigeria

The nurturing of civil society is widely perceived by Western donors and intergovernmental institutions as the most effective means of not only holding rulers to account to the citizens but also establishing the foundation for a durable and consolidated democratic government (Chazen, 1992:282). Perhaps, this explains better the relevance and persistent usages of the word in assessing and analyzing the magnitude and pace of development in the present democratic dispensation in Nigeria. Viewing this assertion from a radical point of view, Allen (1997:329), he argues thus:

> Civil society has become a popular concept in both the analysis of social bases of recent political change in Africa, and external policy support processes of liberal democratic political reform. … Its popularity and continued employment rest on its ideological underpinning, notably on claims that civil society is necessarily distinct from the state, in opposition to the state, and the source of liberal democratic values and pressures. It is thus the proponents of liberal democratic reform, notably those external to African politics that "need" civil society.

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It is an incontrovertible fact that, a fundamental challenge to democratic consolidation in Nigeria is the question of good governance. As Aiyede (2005) puts it, the leadership styles of the post-independence Nigeria elites were perceived to be responsible for the dictatorship, spoils politics and economic failures that have marked the country's political and economic history. The effect has been an uncaring society characterized by pyramidal patron/client relations that have left the society deeply fragmented and factionalized. What has been conspicuously lacking is good governance and accountability. Governance, broadly defined, is the means by which the state acquires and exercises authority to provide for citizens. The outputs of governance processes and systems, at their most basic, are at the core of what affects citizens on a daily basis – roads being built and repaired, health services being delivered properly, and public school teachers getting the supplies they need. Although governance system very greatly, they all tend to have three parts: how governments make things happen, how institutions hold government accountable through checks and balances, and how citizens are actively engaged in the governance process (Malena & McNeil, 2010:13). As the former Vice-President, Alhaji Abubakar Atiku opined:

> Poor governance, among other issues, is the cause of the rising wave of insecurity in Nigeria. What kind of society are we building when about 80 percent of school age children in the North-East and some parts of North-West are not in school? Our energies should be channeled on what needs to be done urgently; enforce rules, value the people, show fairness and equity and assist and protect the most needy and vulnerable (The Nation, November 22:57).

In addition, another major problem confronting Nigeria as a nations in sustaining democratic norm is the lack of accountability and transparency. Accountability is the corner stone of good governance. Unless public officials can be held to account, critical benefits associated with good governance – such as social justice, poverty reduction and development – remain elusive., In practical terms, accountability refers to (a) the broad range of actions and mechanisms (beyond voting) that citizens can use to hold the state to account, such as access to and ability to monitor public budgets, participate in budget formation, and citizens report cards on service delivery; and (b) actions on

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the part of government, civil society, media, and other societal actors that promote or facilitate these efforts (Makena, & McNeil,2010 :6).In the social context, accountability is often defined as the obligation of public power holders to account for or take responsibility for their actions. Accountability exists when power holders must explain and justify their actions or face sanctions. The accountability of state actors is a consequence of the implicit social compact between citizens and their delegated representatives and agents in a democracy. The social compact, in turn, derives from notions of human and citizens right, as enshrined in the General Assembly of the United Nations Universal Declaration of Human Rights (UNDHR) and in many national constitutions. A fundamental principle of democracy is that citizens have both the *right* and the *responsibility* to demand accountability and ensure that government acts in the best interests of the people. Public actors can and should be held accountable for both their conduct and performance. In other words, citizens have the right to ensure that public actors (a) obey the law and not abuse their power, and (b) serve the public interest in an efficient, effective and fair manner.

Nevertheless, Akindele and Adeyemi (2011) in their contribution to the discourse on the concept of accountability specifically contended thus:

> Accountability as a concept has been variously defined and classified; it has been conceptualized as a way of being answerable or liable for one's actions and/or inactions and, conduct in office or position. It has equally been defined as the process of making elected officials and other office holders accountable and responsible to the people who elected or appointed them for their actions while in office. Thus, accountability connotes the state or quality of being liable and required by a specified person or group of people to report and justify their actions in relations to specific matters or assigned duties.

However, these critical areas of emphasis by the civil society groups since the enthronement of democracy in 1999 will go a longer way to facilitate and enhance the consolidation of democracy.

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The concept of democratic consolidation as a phenomenon is subject to different interpretations. According to Diamond (1999):

> Consolidation is the process of achieving broad and deep legitimation such that all significant political actors, at both elite and mass level believe that the democratic system is better for the society than any other alternative they can imagine.

Linz and Stephen (cited in Ogundiya, 2011:254) offer an encompassing tripartite framework of understanding this phenomenon. They argued that the behavioural, attitudinal and constitutional frameworks are the major means of determining democratic consolidation. According to them:

> Behaviourally, democracy becomes the only game in town when no significant political opposition seriously attempt to overthrow the domestic regime or to promote domestic or international violence in order to secede from the state …. Attitudinally, democracy becomes the only game in town when, even in the face of severe political and economic crisis, the overwhelming majority of the people believed that any further change must emerge from within the parameters of democratic procedures. Constitutionally, democracy becomes the only game in town when all the factors in the polity becomes habituated to the fact that political conflict within the state will be resolved according to established norms and the violation of these norms are likely to be both ineffective and costly.

They concluded that with consolidation, democracy becomes regularized and deeply internalised in social, institutional and even psychological life as well as in political calculations for achieving goals. This suggests that consolidation on the one hand emphases that democracy must "make sense" to the generality of the people and on the other, it suggest the non-existence of delegitimizing challenges (Ogundiya, 2011). Put differently, Azeez (2005:24) posited that democratic consolidation does not simply mean the defeat of supposedly undemocratic forces and rulers or the putting in place of democratic institutions and paraphernalia. To him, survival and consolidation of

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democracy has a lot to do with how it is able to better the material conditions of the people in terms of provision of effective and affordable education, shelter, security of life and property, better health care, employment, food, portable water as well as to ensure political stability and thereby save the people from the scourge of war and other violent conflicts. Apart from ensuring socio-economic wellbeing of the people, democratic consolidation also entails the legitimization of the political institutions and processes. Whereas, Onuoha (2004) writing on democratic consolidation posits that:

> Democratic consolidation requires good governance the development of virile and society organizations that would serve as counteracting force to curb the excesses of democratic authorities.

Democratic consolidation implies the internalization of democratic culture and the institutionalization of democratic best practices by a polity that has successfully embarked on a democratic transition (Asiwaju, 200:13). This position is in tandem with the observation made by Diamond et al (1991:13) in the book "*Transition without End"*. In the introductory chapter, the editors of the volume affirmed that:

> If a transition to democracy is ever to be achieved and sustained in Nigeria, a deeper transition must somehow be effected from prebendalism to real institutionalism, where the legal and constitutional rules function, with effectiveness to constraint behavior. This will require not simply wise and imaginative institutional designs of which Nigerians have shown themselves imaginatively capable at times but powerful forces and agencies to enforce them*(Diamond, et al, 1999:13).*

One cannot agree more with this statement especially in the context of Nigeria. Democratic - consolidation, as much as democratic transition is never a smooth-sailing process. It has several ups and downs. Gunther et al (1995) reduce the democratization process to three phases: namely:

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- The fall of the authoritarian regime
- Consolidation and
- Enduring democracy

Whereas, O'Donnell (1992), on his part sees democratic consolidation as a two-step process based on the experience of Latin American countries. The first occurred during the 1970s when the return of democratically elected civilian governments was accompanied by setbacks. The second took place during the 1980s, as the hostility between important factions began to subside and the actors *few* accustomed to the rules of the democratic game (Monga, 2002:7). The point being made here is that the dynamics of power assumes greater complexity as democratization progresses. Conscious efforts must thus be made to prevent a reverse of the gains of democracy on a constant basis. As Monga (2003:7) righty noted:

> The democratic consolidation process is more circular than linear in nature. Indeed, any step forward can be followed by a setbacks, for movement here is a reflection of the clash of different social groups, conflicting interest. Those who stand to lose out are unlikely to give up the status quo without a fight.

His statement brings out the paradox of democratic transitions and shows in clear terms the enormity of the task of democratic consolidation in Nigeria.

In a clear term, if Nigerian CSOs are to play this complex role effectively, in sustaining their mobilizational and conscientising political activities and protect the autonomy of society from the state, they must be strengthened, capacitated and empowered to play the role, in a manner that cushions them from idiosyncratic funding by the international donor community. Within the constraints of Nigeria's political economy, their own resource constraints, their leaders and members of Nigerian CSOs must adopt and utilize creative fund –raising strategies to self-generate, self-sustaining independent funding and seize the opportunity created by the return to democratic rule in the country for political participation, inclusiveness and accountability, which lies at the core

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of constitutional government as limited government and of Nigeria's accession to the African Peer Review Mechanism (APRM) (Jinadu, 2013:86).

Summary and Conclusion

Without mincing words, Nigeria is on the path of democratic consolidation. The idea that civil society is sacrosanct to good governance is incontestable. In Nigeria, the civil society has been central to the democratic struggles, more especially the human right groups. Surprisingly, the civil society on the whole has become moribund or less aggressive (except few human right groups) after the nation re-democratized in 1999. This seriously portends ills for good and responsible governance in the country. Consolidation of democracy via good governance rests primarily on a virile and vibrant civil society.

Since 1999, there has been quite a lot of challenges in the democratic structure with a reasonable approaches. Noticeably, there has been a successful transition from authoritarianism to democratic rule and from one ruling party to another. Notwithstanding, the conduct of elections is still below commendable level, but there are a lot of development in the electoral processes. Within this context, the civil society organisations still need to play a formidable role. The attitude and behaviour of the political class who are only interested in capturing and retaining power at all cost need to be checkmated. No better group or organization can achieve this better than the civil society. Clearly, in the present democratic dispensation, the activities of civil society organizations have enhanced democratic consolidation in Nigeria through the execution of diverse programmes such as voter education, election observation, campaign finance monitoring, election tribunal monitoring, electoral reform advocacy, conflict mitigation, access to justice, public interest litigation, budget tracking; consistency outreaches as well as research and documentation in thematic areas of democracy and governance. These initiatives have made remarkable impact on democratic consolidation in Nigeria (Ojo, 2011).

In sum, consolidation of Nigerian's democracy is not just a question of holding periodic elections. Important as this is, it means developing a democratic culture underpinned by the rule of law. The country must build an egalitarian society with careers open to talents. It should be possible for any

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Nigerian of talent to rise to any position that these talents entitle him or her. The present politically expedient policy of federal character, not functioning as a true federalism should be corrected to reflect appropriate federal state or alternatively, a confederation. This is the only way by which the sense of patriotism will be fostered. There is at present, a feeling in some parts of the country that this republic is not based on equality of its citizens. Such feelings will have to be assuaged through practical power sharing mechanism. In fact, there is need now in this country for convocation of a Sovereign National Conference for all the stakeholders to deliberate on the efficaciousness of Nigeria remaining an entity.

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Impact of Service Quality on Electronic Technology: A Performance of Elections in Nigeria

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Abstract

This study examined the effects of service quality on electronic technology performance in 2015 general elections of the six states in Nigeria such as Bauchi, Edo, Enugu, Kaduna, Lagos, and Niger. These efforts were studied to provide a more credible electoral process, leading to increased citizen participation in future voting exercises and the adoption of several blueprint on electronic voters' registration (EVR). The data collection was conducted based on descriptive correlational research design using quantitative and qualitative approach. The results showed that the level of performance in 2015 general election was high despite the little challenges found in some parts of the country. This trend is attributed to high service quality of automated electoral technology, relative level of acceptance and moderate literacy rate. The result suggested that the electronic voting technology adopted in Nigeria significantly influenced the performance of elections in the six states. It is recommended that the Independent National Electoral Commission (INEC) and other electoral stakeholders should adopt different strategies to improve on the service quality of electronic voting technology for better consistency of election performance.

Keywords: *Service quality, electronic technology, EVR, INEC, electoral stakeholders.*

1. Introduction

The Federal Republic of Nigeria has embarked on a mission to computerize all ministries by increasing the level of adoption and use of information and communications technology (ICT) in the country. The plan involves the initiation of a diversified scope of information systems within governmental organization. For instance, the INEC is one of several organizations targeted by the electronic innovations as a means to

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advance the policies and agendas (McGrath and Maiye, 2010). The application of electronic innovation was to deployed digital technologies by replacing it with EVR, voter verification, and results transmission. Electronic voting (e-voting) is one of the innovations in which governments try to engage citizens in a development initiative with strategic importance for upholding democracy in a society. E-voting is seen as having the potential to bring transparency to governments' activities and decisions, combat the manipulation that often affects electoral activities (Avgerou et al., 2007).

Indeed, there are many research studies on the effect of e-voting system and adoption of the technology in Africa, but less research work has been conducted on technology performance and service quality of elections, and potential challenges of transition. (Mensah, 2017) studied the factors affecting adoption and use of an e-voting system in Ghana using technology acceptance model. The results showed that over 71.1% of the respondents recommended Ghana's Electoral Commission (GEC) to adopt an e-voting system, and other 28.9% felt the contrary. This was attributed to individual differences with regard to perceived ease of use, system integrity, and perceived credible elections (PCE). (Achieng and Ruhode, 2013) investigated the adoption and challenges of e-voting technologies in South Africa. It was found that e-voting has raised user competency issues due to the technology complexity involved. In addition, the people in rural experience e-voting technologies difficulties to use especially those that have never used computers before. Another similar study conducted in Togo by (Amegnran, 2017), reported that poor training is one of the key findings among deficiencies undermining poll workers' performance. According to the literature reported by (Bowman and Githaiga, 2015), 2013 Kenya elections encountered several technological problems; laptop batteries were running dead at some polling stations, biometric kits were crashing, and electronic results transmission failure. This trend may be attributed to the lack of technological performance testing and service quality before election.

In Nigeria, (IshaqSalimonu et al., 2013) studied the determinants of e-voting adoption by INEC. A questionnaire survey and 500 managerial staff of the electoral commission as the units of observation was adopted for data collection. An analysis of the data reveals that significant captivated of e-voting in Nigeria were political goodwill, electoral technology progress on the African continent, people confidence in the technology reform and capacity to invest in new technology. It was suggested that there was need for a micro and quantifiable research to address the scope and gaps hinted early on service quality consideration and technology performance in Nigeria. Most of African countries, especially in Nigeria, it is difficult to register voters close to their homes. This trend is due to the insufficient number of voters that

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biometric smart card readers (SCRs) are programmed to accept in a given polling station. Many voters are therefore registered very far away from their place of residence, and this creates confusion among them when it comes to locating their proper polling station on election day (Iwuoha, 2018).

This research paper aims to study the impact of service quality on electronic technology and performance of elections in Nigeria. In addition, the population target by the study include the entire grownup population (18 years plus) of the six states in Nigeria such as Bauchi, Edo, Enugu, Kaduna, Lagos, and Niger. The purpose of selecting the entire grownup and adult population is to target the population involve in a set of units with quantifiable potentials for which the data are used to make inferences.

2. Research Approach

This study is based on research data collected during post-election, long field trips visits across six geopolitical zones in Nigeria, namely, Niger in North Central (NC); Bauchi in North East (NE); Kaduna in North West (NW); Enugu in South East (SE); Edo in South-South (SS); and Lagos in South West (SW). The federal states engaged in this study are as follows: Bauchi, Edo, Enugu, Kaduna, Lagos, and Niger. The population size of these states, from largest to smallest is as follows: 9,113,605 in Lagos; 6,113,503 in Kaduna; 4,656,066 in Bauchi; 3,954,772 in Niger; 3,267,837 in Enugu; 3,233,366 in Edo (Wikipedia, 2018). The recent statistics in 2018 indicate that there were 2,462,843 registered voters in Bauchi; 2,210,534 in Edo; 1,944,016 in Enugu; 3,932,492 in Kaduna; 6,570,291 in Lagos, and 2,390,035 in Niger (INEC, 2018).

The interviewees mostly belonged to the uneducated, educated and semi-educated middle class, with only shallow knowledge about the government and its activities. The population target by the study include the entire grownup population (18 years old and over) within the six states, and who understand how its affairs are managed. However, the recorded interviews, informal conversations and discussions took place throughout the fieldwork with a diverse group of informants such as websites of the government, INEC, state independent electoral commission (SIEC) officials, local electoral civil Society (CS), political parties (PP) executives, and external agencies; this fundamentally enlightened and influenced the research.

The number of respondents in the sample strategies through the interview, questionnaire, and focus groups discussion (FGDs) were presented in Table 1. For purposely selection, 27 respondents were asked to fill the interview guides as key informants. As the results selected from stratified random sampling, 198

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respondents were asked to fill the questionnaire. In addition, 40 respondents were conveniently selected to participate in the FGDs as summarized in Table 1. The data collected was analyzed and presented using descriptive statistics; arithmetic mean and standard.

Table 1. Summary of the sampling procedure

Sampling strategy	Category	Sampling frame	Sample	Method
Purposive sampling	INEC	521	18	Interview
	PP Executives	205	09	
	Sub total		27	
Stratified random sampling	INEC	503	76	Questionnaire
	SIEC	521	94	
	PP Executives	196	28	
	Sub total		198	
Convenient	Electoral CS	113	20	FGDs
	Electorate	109	20	
	Subtotal		40	
Grand Total			265	

Source: Field survey (2018)

3. Results and Discussion

3.1. *Response rate*

The rate of response from the designated sample was computed. The original sample size was 265 respondents intended for the questionnaire survey, interviews and FGDs. The purpose of minimizing the response gap is to dispensed 200 questionnaires instead of 198 as planned, 29 interview guides instead of 27, and invited 44 FGD participants instead of 40 as reported in section 2. The response rate of the intended field survey informants is shown in Table 2.

Table 2. Field research response rate

Instrument	Category	Sample	Returns	Unreturned	*RR (%)	**ARR (%)
Questionnaire	INEC	76	72	04	97.3	98.4
	SIEC	94	92	02	97.9	
	PP Executives	28	28	00	100.0	
	Subtotal	198	192	06		
Focus Group	Electoral CS	20	18	02	90.0	92.5

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Instrument	Category	Sample	Returns	Unreturned	*RR (%)	**ARR (%)
Discussion (FGD)	Electorate	20	19	01	95.0	
	Subtotal	40	37	03		
Interview Guide	INEC	18	15	3	83.3	
	PP Executives	9	9	0	100.0	91.7
	Subtotal	27	24	3		
	Grand total	265	253	12		
Grand Average Response Rate (%)						94.2

Source: Field survey (2018) Note: * Rate of Return; ** Average Rate of Return

The results were sufficient to be address as research objectives, because it is recommended that a response rate < 70 % is adequate in social science research (Fincham, 2008).

3.2. *Quality of e-voting technology*

The sample distribution (*n*=192) on item A and B in Table 3 shows that 17.2% and 14.1% of the respondents strongly agreed and 35.4% and 33.3% others agreed that the electronic voter registration technology was good. Also, 28.1% and 24.5% of the respondents were neutral, while 15.1% and 20.3% disagreed and the rest of 4.2% and 7.8% strongly disagreed in A and B respectively. The results indicate that the electronic technology used for voter registration was good in areas by 52.6% and 47.4% of the respondents, fairly good in parts overseen by 28.1% and 24.5%, and poor in localities of 19.3% and 28.1% of the respondents, respectively.

Table 3. Description of electronic e-voter direct data capture technology

Descriptive tool	Response scale	(A) e-voter registration technology good	(B) e-voter verification technology efficient
Distribution (n=192)	SD	8 (4.2%)	15 (7.8%)
	D	29 15.1%)	39 (20.3%)
	N	54 (28.1%)	47 (24.5%)
	A	68 (35.4%)	64 (33.3%)
	SA	33 (17.2%)	27 (14.1%)
Mean		3.46	3.26
Std. Deviation		1.073	1.163

Source: Field survey (2018)

The statistical result shows that at ($\bar{x}$=3.46) and ($\bar{x}$=3.26) for both A and B respectively, the arithmetic mean

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is high and the standard deviation generated was very spread at 1.07. This connotes that the quality of electronic direct data capture of voters was highly rated by respondents in most of the states of research despite some reservations from a few respondents.

3.3. *Quality of e-voting technology vs. level of election performance*

The multiple linear regression used in this study was to determine the exact service quality of electronic technology and predicted election performance in the states of study. The results presented in Table 4, shows the specific regression statistics of electoral predictions and quality of electronic technology applications for individual and main activities of the election process. Table (4) and (5) shows the analysis of variance for *P*-values, where a *P*-value of less than 0.0500 indicates that the model terms are significant. In this case, electronic voter data capture, vote cast assistive technology, vote collating, vote safety and dissemination are quite significant influences on election. Values greater than 0.1000 indicate the model terms are not significant (Yusuf and Inambao, 2019). The predicted coefficient of determination (R^2) was found to be 0.952 which is in reasonable agreement with the adjusted coefficient of determination (R_a^2) of 0.964; the difference is less than 0.2. This shows that the (R_a^2) was found to be very high, which implies that the model accounted for 96.4% of the variability in the data.

Table 4. Predictive statistical regression co-efficient of electronic technology adopted for individual electoral activities of the general elections

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	0.141	0.046	-	3.040	0.003	0.050	0.233
1. Electronic direct voter data capture	0.287	0.089	0.314	3.227	0.001	0.112	0.463
2. Electronic voter identification (for vote casting)	0.305	0.147	0.343	2.072	0.040	0.015	0.595
3. Electronic vote collating	0.235	0.117	0.258	2.013	0.046	0.005	0.466
4. Electronic vote safety & dissemination	0.064	0.116	0.071	0.550	0.583	-0.165	0.292

Source: Field survey (2018) Dependent variable: Level of election performance

In the regression statistics, all the electronic poll technologies were important but the most required for

improved election performance was electronic voter identification for vote casting, electronic voter data capture, electronic vote collating, electronic vote safety and dissemination in that direction.

Table 5. Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.982[a]	0.952	0.964	0.19243

Note: [a] Predictors: (Constant), e-direct data capture, e-vote collating, e-vote cast assist, e-vote safety and dissemination.

According to Table 5, R^2= 0.952 predict that the service quality of e-voting technology contributed 96.4% to the performance of the 2015 general elections. The rest of the factors related to technology predicted 4.8% (0.048). The multiple linear regression model was determined using equation (1) below (Kilic, 2013):

$$Y= \beta o+ \beta_1 X_1+ \beta_2 X_2+ \beta_3 X_3+ \varepsilon \quad (1)$$

Where:

Y = Dependent variable (Election performance)

β_0 = Constant or intercept (value of the dependent variable at zero factors).

$\beta_1, \beta_2, \beta_3, \beta_4$ = Regression coefficients of independent variables.

X_1, X_2, X_3 = Independent variables (electronic voter data capture, vote cast assistive technology, vote collating, vote safety and dissemination).

ε = Stochastic or disturbance term or error term.

The election performance was determined using regression equation (2) below:

$$Y= 0.141+ 0.287 X_1+ 0.305 X_2+ 0.235 X_3 + 0.064 X_4 \quad (2)$$

It is suggested that increase in the service quality of electronic technology for every activity of the electoral process may lead to increase in the level of election performance. Therefore, the quality of automated electoral technology significantly influenced election performance in all federal states.

Conclusion

In conclusion, the application of electronic innovation was to deployed digital technologies by replacing it with e-voting. This is the innovations which governments try to engage citizens in a development initiative

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with strategic importance for upholding democracy in a society. However, some of the key findings of this study are summarized below:

1. The electronic technology performance was highly rated due to the significant influence on e-direct voter data capture, despite some quality concerns in some parts of the country. This may attribute to the failure occur on kits distributed without power or with no time for their charging.
2. Increase in service quality of this electoral technology led to increase in the level of election performance.
3. The finding shows that most required areas of improvement for election performance are electronic voter identification for vote casting, electronic voter data capture, electronic vote collating, and electronic vote safety and dissemination.

These electoral experiences did not happen by default but rather due to electoral technology differences. Besides, INEC, SIEC and external agencies should ensure that appropriate strategies are adopted to maintain, replicate and improve service quality reported about the following electoral bound electronic technology applications.

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Understanding the landscape of behavioral finance biases and the adoption of mathematical models in strategy formulation

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Abstract

Persistent occurrences and phenomenon in the economic and financial systems about which there appears to be no sustainably effective solution are of concern to various stakeholders. Following the financial crisis of 2007-2008 there was a flurry of research activity geared towards explaining what the major causes of this and similar occurrences before were. Similar soul searching occurs after every such phenomenon, as evidenced when the South Sea Bubble burst centuries ago and other such crises that have occurred in the financial markets. This paper reviews some of the theories and what, in behavioural finance, are referred to as biases. An emerging strand of research is the field of neuroeconomics according to which medical imaging technology now allows us to look at brain activity as decisions are being made. The approach helps us to understand the nature and reasons for certain behavioural biases. Recent scientific studies have demonstrated that individuals with brain lesions that impaired emotional decision-making were more likely to behave as rational investors than individuals with normal brains. The paper reviews some of the quantitative or mathematical models used to explain behaviour underlying strategies used to make decisions in financial markets in particular and investment in general, namely, Prospect theory model, Quantitative Behavioural Model (QBM) and Igor's portfolio rule and investment strategies model.

Key words: Behaviour, Finance, Biases, Mathematical Models, Theories

1. Introduction

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The use of mathematical and quantitative approaches as tools of explaining behaviour and phenomenon in finance has won admiration from academics and practitioners. Using probabilistic theory to quantify risks and quadratic programming to derive solutions to economic and finance questions, Markowitz is among the earliest and most notable contributors to neoclassical finance and economics. He is among others, credited for developing the mean–variance portfolio selection model[1]. About twenty years later Black and Scholes of the option pricing theory fame, offered an alternative by way of Itoˆ calculus and partial differential equations to explain issues of finance and economic behaviour[2]. Most specifically for behavioural finance, Daniel Kahneman, originally a psychologist deservedly won a Nobel prize in 2002 for his work on the prospect theory. However, evolving and application of mathematical and quantitative tools has been slow in behavioural finance, and this has been attributed to the fact that behavioural problems bring in highly unconventional and challenging features for which the known mathematical techniques have had very limited application, thus the need of new mathematical theories and approaches, instead of mere extensions of the existing ones[3]. Behavioural finance may also be viewed from the perspective of being micro or macro. Micro behavioural finance analyses behavioural biases identifying individual investors considered as totally rational economic beings, homo economicus. It questions the authenticity of the traditional rational decision-making theories. Its proponents argue that behavioural biases have a profound impact on decision-making and can make suboptimal decision- making and errors that directly contradict with traditional finance. Macro behavioural finance, on the other hand, analyses market anomalies that distinguish financial markets from efficient markets assumed by traditional finance and it questions the informational efficiency of markets. According to this approach to behavioural finance, financial markets are impacted upon by behavioural influences, such as market anomalies, bubbles, excess volatility and limited arbitrage[4].

2. Traditional approaches

The traditional approach to finance adopts a normative approach, outlining how the real world should function. However, it simplistically assumes players in the market to be rational Homo economicus, permanently seeking continuous dynamic optimization and equilibrium as postulated in accordance with the efficient market hypothesis. It is the basis of Modern portfolio

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theory, mean variance analysis (expected returns, volatility of returns), Capital Asset Pricing Model and such other models of positive approach, which attempt to describe how the real world conceivably functions. Dissatisfied with some of the theories and models, some researchers adopted the behavioural finance approach. It is based on academic research in cognitive psychology and adopting the thinking that unlike the rational Homo economicus of the traditional finance school, players in the real world market are more likely to display irrational behaviour, guided more by emotions, optimism, pessimism, greed and fear than by rationality.

A landmark development in explaining market behaviour in finance was the efficient market hypothesis (EMH) according to which in prices of securities or shares is impounded all available information at that point in time and that therefore such prices are optimal estimates of the true value of investment in these securities or shares[5]. The hypothesis posits that there are three levels of efficiency. The first is the weak form, which is when the decision maker only has past prices and returns as a guide. The second is the semi-strong form, when the decision maker has all information that is publicly available. The third and desirable form is the strong form, that is, when the decision maker has all public and private information as well.

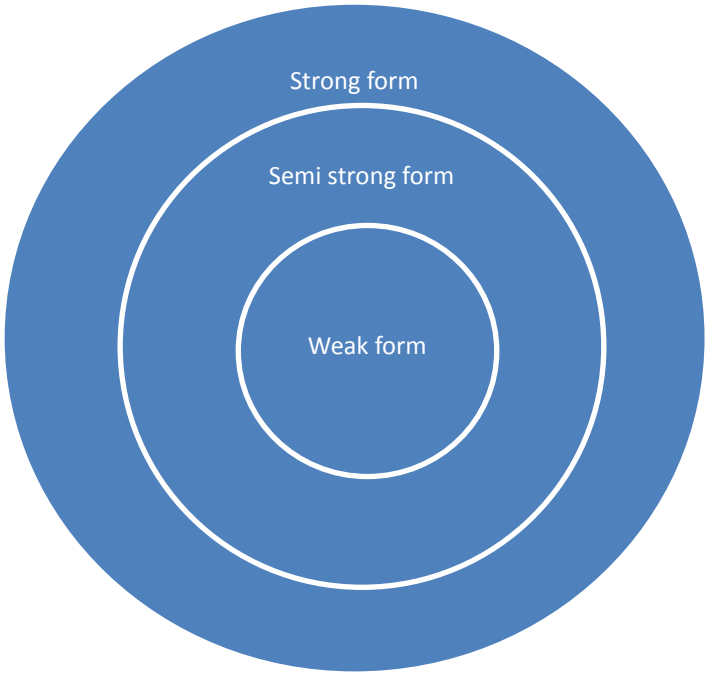


Figure I: Three Forms of Efficiency

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Proponents of EMH premised their arguments on the key assumption that investors behave rationally on the basis of the information available and incorporated at the point in time, reinforcing this with the subsidiary arguments that there are incentives to gather and process information about securities and trade on the basis of the decision makers analysis until individual participant's valuation is similar to the observed market price and therefore that it can be concluded that when prices are thus determined, opportunities to earn above-normal rates of return on a consistent basis are limited.

The EMH principal and subsidiary arguments as well are diluted and proven fallacious in light of the fact that on a daily basis and globally, there is evidence of irrational behaviour in financial markets in particular and others in general. The traditional finance philosophy of rationality in decision making in financial markets is blurred by the inadvertent influence of beliefs, values and attitudes driven by socio-psychological and economic factors. These translate into behavioural biases which impact on the decisions eventually arrived at and this is so despite the multiplicity of financial models and technology available to facilitate decision making. Furthermore it is practically impossible to have all information that can enable one to precisely make valuation similar to the observed market price because like Donald Rumsfeld observed regarding ambiguity *"Reports that say that something hasn't happened are always interesting to me, because as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns — the ones we don't know we don't knowns."*[6]

3. **Multidisciplinary Approach to Behavioural Finance**

The role of law, politics, ecology as well as science and technology as factors influencing decision making by investors cannot be underestimated. Similarly, suspicions and uncertainties created when there is friction between the major global economic powers or those generated to join or leave an economic or political grouping greatly impact on investor behaviour and decision making. Regarding ecology, climatic change and the resultant effect on flora and fauna greatly impact on the human activities including agriculture, trade, manufacturing as well as the resultant decisions to invest or not, productivity and production of sectors and the returns of

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ventures invested in.

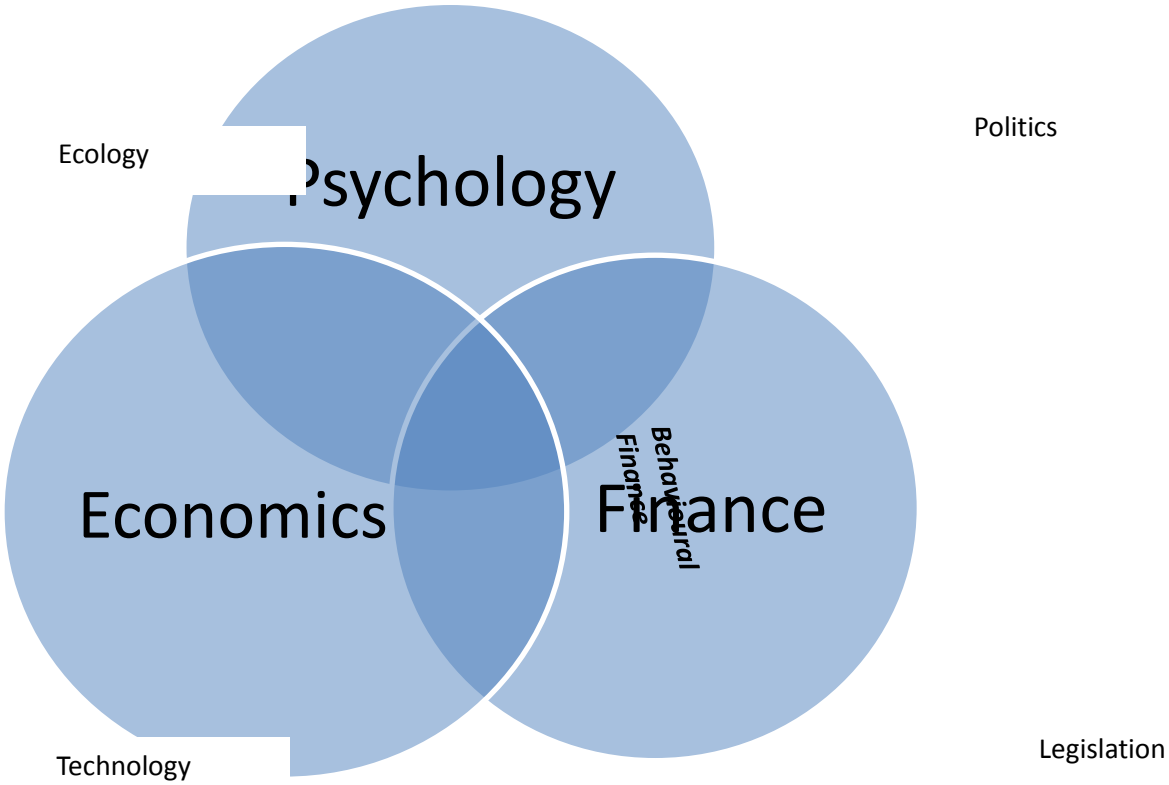


Figure 2: Multidisciplinary nature of Behavioural Finance

One emerging strand of research is the field of neuroeconomics. Medical imaging technology now allows us to look at brain activity as decisions are being made. This helps us to understand the nature of and reasons for certain behavioural biases. A recent study demonstrated that individuals with brain lesions that impaired emotional decision-making were more likely to behave as rational investors than individuals with normal brains. Other imaging studies have confirmed that the rational parts of our brain are in tension with the emotional or limbic sections of our brain[7]

4 Theoretical Framework of Biases Heuristics

As the behavioural finance discipline evolves various theories, and what have been referred to as biases have been used to explain the decision-making process and mindset of investors to arrive at what they believe may be winning strategies. One such approach has been to categorise as either general-purpose heuristics and special purpose heuristics. Examples of general-purpose

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ones are availability, causality, fluency, similarity and surprise. The six special purpose heuristics included attribution substitution, outrage, prototype, recognition, choosing by liking and choosing by default.

Another approach has been to divide biases them into four categories. The first category is that of those arising out of rigidity of opinion (cognitive dissonance) including conservatism, Status quo, confirmation, representativeness, illusion of control, disposition, belief perseverance and hindsight. The second category are those pertaining to information processing, namely, anchoring and adjustment, mental accounting, asset aggregation, framing, under-reaction and over-reaction, effect randomness, herding behaviour, and availability. The third category are emotional based biases including loss aversion, regret avoidance, prospect theory, over optimism, overconfidence, illusion of knowledge, self-attribution, self-control, loss aversion, status quo, endowment, regret aversion, escalation of commitment, gambler's fallacy and home bias.

In the sections that follow below some of these biases are discussed.

4.1 Rationality

When a person has consistent preferences, he or she is said to be rational. However, it is difficult to find such a person in the real world because choices and pay-offs are logically premised on priors such as beliefs and predictably human behaviour is characterised by individuals appearing to have inconsistent preferences much of the time. Human behaviour is the potential and expressed capacity for physical, mental, and social activity during different phases of one's life cycles. Behavioural finance has its roots in the need to provide a discipline with a multidimensional approach to explaining behaviour of players in the market on the one hand and market phenomenon like depressions, bubbles and bursts, scams and crashes on the other. It has been defined as a study of human psychology and the rationality of making financial decisions not blurred by the traditional assumptions of expected utility maximization as had been assumed in efficient market hypothesis[9].

In comparison with mainstream approaches to finance decision making, which assume a fully optimal and efficient market, behavioural finance has, as a major objective, enabling a practical appreciation of financial decision-making and analysis as opposed to the former that assume that

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financial markets are inherently fully optimal and efficient. In recognition of its strategic and global importance of the behaviuoral finance discipline, the Behavioural Finance Working Group (BFWG) was established. It was from the brilliant works on cognition that Daniel Kahneman was awarded a Nobel Prize[10].

Many of the behavioural finance biases are generally relative to the Bayes rule for updating our priors on the basis of new information which exists to influence the decision-making processes of players in the financial markets. The biases relate to how we process information to reach decisions and the preferences we have. As they are domiciled deep in our psyche it is pertinent that we appreciate not only their existence but also the potency with which they can impact on our decisions and eventually the results of our decisions. This way we may be able not only to reduce their influence and learn to work around them, but we may indeed be able to extrapolate the benefits or returns. Some of these are the subject of discussion below.

4.2 Prospect Theory

The likelihood of a certain outcome or outcomes resulting from an action or actions is a key driver or demotivator for a person acting in a certain direction or not. The prospects theory explains the apparent regularity in human behaviour when making decisions in situations of uncertainty. The theory states that individuals place much more weight on the outcomes that are perceived more certain than those that are considered merely probable. This aspect of the theory is referred to as the certainty effect. Accordingly, gambles are evaluated relative to a reference point, whereby decision makers analyse assumed gains and losses differently and that incremental value of a loss is larger than that of a gain, that is, the hurt of a $1000 loss is more painful than the benefit of a $1000 gain. The key conclusion of the prospect's theory is that misfortunes, losses and impediments have more prominent effect on inclinations than increases and preferences[11].

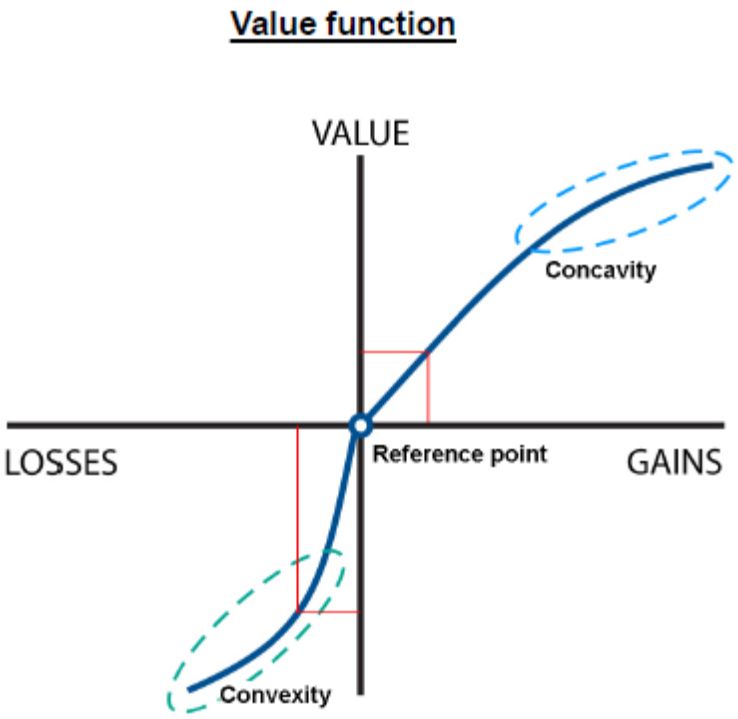
Psychology regarding decision making has been categorised as being either intuitive and deliberate mental processes. Intuitive processes are effortless, implicit and often emotionally charged. Deliberate ones are effortful, explicit and consciously controlled[12]. Two main cornerstone features of the prospect theory are that value is assigned to gains and losses rather than to final assets (value function) and that probabilities are replaced by decision weight (weight

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function).

Figures 1 and 2 below give a graphic description of these features. Along the number line continuum gains and losses originate from a reference point and the vertical line represents values. The value function is defined on deviations from a reference point and is normally concave for gains (implying risk aversion), commonly convex for losses (risk seeking) and is generally steeper for losses than for gains (loss aversion). The about 2 times steeper curve (2x) for losses compared to x for gains confirms the thinking in prospects theory that people feel losses(convex). much more than gains(concave). It is the relative values that are of significance when making decisions rather than absolute values.

Figure 1 Value Function



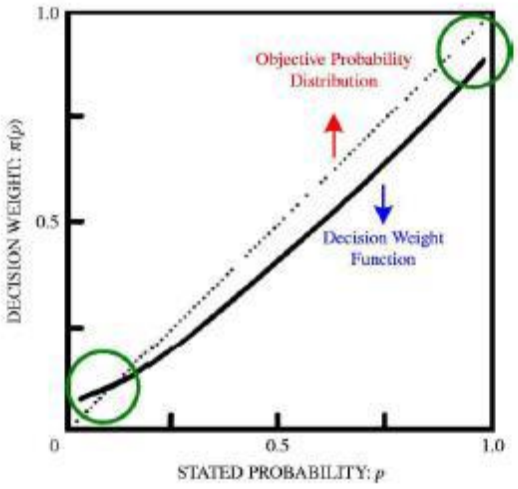
Regarding weighting the tendency is to over weigh probabilities of the higher and lower magnitude and under weigh those in the middle of the continuum. Like for the value function this makes the middle probabilities more realistic and therefore more reliable.

Figure 2 Weighting Function

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Weighting function

(second cornerstone of prospect theory)



The experiments carried out in respect of the prospect's theory confirms a distinctive fourfold pattern of risk attitudes, namely, risk aversion for gains of moderate to high probability and losses of low probability, and risk seeking for gains of low probability and losses of moderate to high probability.

The function is normally concave for gains (implying risk aversion), commonly convex for losses (risk seeking) and is generally steeper for losses than for gains (loss aversion). The function predicts a distinctive fourfold pattern of risk attitudes: risk aversion for gains of moderate to high probability and losses of low probability, and risk seeking for gains of low probability and losses of moderate to high probability[13].

4.3 Cognitive Dissonance

The tendency to adjust beliefs to justify past actions is a psychological phenomenon termed as cognitive dissonance. Research findings indicate that investors differ in their propensity to rely on a quick, affect-based decision mode, with the conscious planning based mode being a main feature of choosing among a repertoire of strategies available to them. With regard to investment decisions, individuals seek to reduce by adjusting their beliefs about the efficacy of past investment choices in the context of investment decision-making, especially when they find that

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their convictions and suspicions defy their expectations. They will accordingly tend to disregard new data that negates known convictions and choices[14].

4.4 Loss Aversion

It is predictable and logical for investors not to wish for loss and therefore to engage in mental processes geared towards eliminating or reducing the psychological impact of loss. They therefore have a natural desire to avoid admitting an error and incurring a loss. Such tendency is referred to as regret or loss aversion. It is the reason behind investors holding on to losing positions too long and staying out of a market that has recently generated losses even when gainful investment bargains exist. For example, an investor who buys shares for £1,000, which rises quickly to £1,500 in a market would be tempted to sell it in order to lock-in the profit, whereas if the investment dropped to £500, the investor would tend to hold it to avoid locking in the loss. The assertions above have been confirmed by earlier researchers who concluded that investors are about twice as averse to taking losses compared to enjoying an equal level of gains. Thus, most would require an even (50/50) chance of a gain of £2,500 in a gamble to offset an even chance of a loss of £1,000 for the proposition to be attractive[15].

The implication is that the general tendency is for investors with losing positions to prefer breaking even, that is investors tend to be highly risk-averse when facing a profit-making prospect which results in their selling to lock in the sure gain. The reverse is inevitably true, with investors being more risk tolerant or risk seeking when faced with incurring a loss, and they therefore tend to hold onto the investment in the hope that the market prices will favourably increase again. In some behavioural finance literature, the tendency for investors to sell a winning shares or stock and retaining a losing stock is called the *disposition effect*. It indicates that investors tend to sell winners and hold losers[16].

In a situation of what has been described as *myopic loss aversion*, too much importance is attached to routine daily fluctuations in the market, while it is sub optimal behaviour to abandon a long-term investment venture when faced with normal market behaviour. Accordingly, whereas risk aversion has for long been deemed to accurately describe investor behavior with gains. It is also true that when faced with a loss-making situation, investors often show risk seeking behavior.

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4.5 Overconfidence

The tendency to believe that certain things are more likely than they really are is referred to as overconfidence. It is the complete opposite of many of the biases noted in behavioural finance research findings such as regret avoidance and loss aversion, among others. With that state of mind investors overstate their knowledge and competences, exaggerate their ability, under estimate and take risks in the hope that things will conform to their expectations.

At the extreme, either out of lack of knowledge or sheer recklessness, some investors do not diversify their investment. This stance is a result of an inflated view of their abilities. The quite common trait affects much of our lives with research indicating that most people rate themselves in the top third of the population. Indeed, many studies – of company CEOs, doctors, lawyers, students, and doctors' patients tend to overrate the accuracy of their views of the future[18].

Despite some shortcomings, this attitude enables people to overcome or recover from life's disappointments far faster than they would have done if they did not have the trait. Quite often they overlook traditional financial theory which argues for holding diversified portfolios as a means of risk management, and with what appears 'misguided conviction', the overconfident investors go for what they believe are good or even excellent prospects. Many go for major contractual bids with quite sophisticated "theoreticians" whom they beat with intuition and displayed versatility! Overconfidence relates to how well individuals comprehend their own particular capacities and the points of confinement of their knowledge[19].

4.6 Self attribution bias

Some investors are so highly motivated by the skill and luck which they attribute to themselves ('self-attribution bias) that when faced with a positive outcome following a decision, they will view that outcome as a reflection of their ability and skill. However, when faced with the prospect of a negative outcome, it is attributed to bad luck or misfortune. Unfortunately, this attitude blurs the feedback process as it allows decision- makers to block out negative feedback and the resulting opportunity to improve future decisions. Many psychologists have concluded that a large portion of the financial specialists tend to dangerously overestimate their capacity to make correct decisions.

4.7 Herding behaviour

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In life there is general belief that there is security or comfort in numbers. It is therefore not surprising that investors and analysts scan the environment to observe the actions and reactions of other players, and in response, head in the direction where the majority are moving, rationally or irrationally. This is likened to the movements of herds of animals, whether domestic or wild. The herding behaviour theory has been often used to interpret and predict price movements as well as to explain economic phenomenon like bubble build ups and bursts and other financial or economic crises. In effect herding could be a contradiction of the overconfidence bias and of information efficiency. It predictably leads to market stress by pushing asset prices away from their fair values as supported by the economic fundamentals, hence driving up market volatility[20].

The subprime crisis in the US is the most recent experience of herding behaviour with great ramifications on the global financial system. Between 2000and 2007, real estate prices in the country skyrocketed on account of investor's herding behaviour. They borrowed loans to buy houses for short-term profits. The temptation was not only the preserve of low-income households but also institutional investors who went in droves throughout the country to acquire mortgages. The relatively sophisticated institutional investors had the advantage of better access of information, which however was basically the same, and that was, that of historically low interest rate. Given the aversion bias in the context of stock market after bubbles, they homogeneously made decision to change their preference in housing investment. In their excitement banks heavily, and almost indiscriminately, lent out in the mortgage sector and their predicament was compounded by doing so on the basis of loose lending standards. Predictably this was followed by massive defaults, delinquencies and panic in the financial markets. Institutions ironically referred to as "too big to fail" had to be rescued through funding by government.

4.8 Groups and Crowds

It is important to appreciate how groups and crowds when, whether as natural persons or corporates are required to make decisions. Groups are typically appreciated on the basis of synergies which they are supposed to confer on the participants, including benefiting the competences or endowments of each participants. From the social point of view individuals

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prefer belongingness to isolation. In a 'ask the audience' feature of the Who Wants To Be a Millionaire quiz show research, the audience findings indicated that the range of knowledge and experience is diverse and that individuals give their opinion independently of the opinions of others[21].

According group-mind theory, individuals who became part of a crowd would lose all sense of self and responsibility when but they would gain a sentiment of invincible power due to their numbers[22]

4.9 Representativeness

It is logical to believe that a well-run company represents a good investment, which in turn implies that other factors follow accordingly. Therefore, representativeness is judgment based on stereotypes. The notion of 'representativeness bias reflects the case where decisions are made based on a situation's superficial characteristics (what it looks like) rather than a detailed evaluation of the reality. A common financial example is for investors to assume that shares in a high-profile, well-managed company will automatically be a good investment. This idea sounds reasonable, but ignores the possibility that the share price already reflects the quality of the company and thus future return prospects may be moderate. Another example would be assuming that the past performance of an investment is an indication of its future performance. In our psyche representativeness makes us believe that things that share similar qualities are quite alike. Players in financial markets especially technical analysts interchange a good company with a good investment and vice versa and when faced with firms having stocks characterised by a consistently good history of earning growth, they would tend to overvalue them. This is inherent in the various share or company valuation models such as dividend valuation and dividend growth models.

4.10 Framing

Unlike in traditional finance theory where it is recommended that all of an investor's investments should be treated as a single pool, or portfolio, such that risks of one or several cancel out with those of others through this diversification, in behavioural finance it is recommended that investors highly focus on the behaviour of individual investments , strategic business units or securities. Under this later approach the emphasised 'individualism' or 'narrow

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frames' heighten investor sensitivity to loss as opposed to 'aggregation' under which investors comfort themselves with the risk reducing covariance of the 'wide' frame, which enables investors to exhibit a greater tendency to accept short-term losses and their effects, with little consideration of the long term results.The main argument in favour of the behavioural finance approach is that there were justifications and merits for the investor to opt for a particular investment, strategic business units or securities and not others and have them as part of the portfolio. Record of the individual elements of the portfolio enable the investor to make more rational evaluation about whether individual securities or investments or market circumstances are changing so as to warrant change in the composition of the portfolio or strategy or both.

4.11 Hindsight Bias

The tendency to remember positive outcomes and repress negative outcomes is referred to as hindsight bias. There is therefore the temptation for investors to reminisce, with good memories, strategies that delighted them and not to dwell on the numerous times the strategy did not work. In statistical term an outcome's occurrence increases its perceived ex-ante probability of occurrence. The result is for investors to unambiguously violate rationality precepts in adjusting their estimates of the ex-ante probability of an outcome they know has occurred. This is if, but only if, they underestimate the possibility that the actual distribution of observed outcomes is a result simply of sampling error.

4.12 Mental Accounting

Mental accounting is a behavioural finance bias according to which there is a tendency for people to categorise their money into separate accounts based on a variety of subjective criteria such as the source of the money and the purpose for each account. It has also been referred to as the tendency to "put things in boxes" and track them individually. The mental accounting process involves three components. The first one involves establishing the intended outcomes of a decision or decisions and how subsequently these will be evaluated. Secondly the decision is made on as to what will be carried out in relation to specific accounts and how inflows and outflows relating to the activities relating to these accounts will be tracked. Finally, outcomes are periodically reviewed and balanced.

In our mindsets we separate wealth and allocate it into various buckets or pools according to our

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objectives of having it and the risks related thereto, quite often according to time horizons. In practice individuals have criteria according to which they use or allocate their money, say on a monthly basis one may, using their discretion, save 30% for precautionary measures, 20% for investment and the remaining 50% for subsistence. For businesses they may be divided into strategic business units and funds allocated accordingly. In doing all these, whether for individuals or businesses there is criteria or policy adopted whether formally or informally. This way the individuals or businesses allocate their cash into distinctive mental accounts based on a mixture of subjective criteria, similar to the source of the cash and reason for every account.

4.13 Asset Segregation

The tendency to look at investment decisions individually rather than as part of a group is referred to as asset segregation and it makes an investor concerned more about those individual holdings which perform below expectation even when majority in the portfolio excel.

4.14 Anchoring

When making numerical prediction, estimates may be made by starting from an initial value referred to as an anchor to arrive at final judgements or answers, which may be suggested by the formulation of the problem, or it may be the result of a partial computation. In making investment decisions**,** as an introductory point, investors tend to remember the price they paid for a stock, and this information influences their subsequent decisions about what price they charge their customers. In forecasting when there are previous periods, there will be a closing figure for the most last period which can be adjusted to yield the final answer, although this may be insufficient without well thought out assumptions[23]. In the financial sphere, values such as market index levels can act as anchors. Round numbers such as 5,000 points on the FTSE 100 Index, seem to attract disproportionate interest, despite them being numbers like any other.

4.15 Availability bias

This is a judgmental heuristic in which a person evaluates the frequency of classes or the probability of events by availability. It refers to the ease with which relevant instances come to mind.' Accordingly, recently observed events are believed to influence decision. A witness of a disastrous passenger plane crash in the recent past is more likely be very cautious when offered an opportunity to invest in the airlines sector or will be sceptical to travelling by plane than one

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who has not done so. In business investors who have observed a particular sector experiencing difficulty or an unstable financial market are likely to be sceptical before engaging in it. Psychologists refer to this as the 'availability bias'. It leads to overestimating the chances of disaster[24].

4.16 Conservatism bias

Even with new information available in the business decision making environment, some investors may be slow in responding and making changes to their original decisions or at most they may only slightly or partially adjust. This behaviour bias is referred to as conservatism bias. Thus, investors who buy shares in a high-profile company may be slow to adjust their view of the company's prospects even after the company's profitability deteriorates or if another company whose profile, they are not sure of presents an attractive proposition.

5 Mathematical Models in Behavioural Finance

Over time, behavioural finance has graduated through a predominantly narrative discipline, to one whose theories are augmented by use of quantitative or mathematical models. Those explored here are the Prospect theory model, Quantitative Behavioural Model (QBM) and Igor's portfolio rule and investment strategies model

5.1 Quantitative Behavioural Model (QBM)

Based on the assumption there is a market and after observing the behaviour of each of the participant in a market, a researcher will have knowledge that in that market there are many participants whose behaviour is very different from each other and that the actual market price is an aggregation of all the participants' expectations in the financial market. The proportion of each participant (called weight) determines how important they are in influencing the direction of the market.

The representative Quantitative Behavioural Model (QBM) model is:

$$E(Y_{QBM}) = W_1 * E(Y_{Investors}) + W_2 * E(Y_{Speculators}) + W_3 * E(Y_{Retail}) \ldots\ldots\ldots \text{(i)}$$

$E(Y_{QBM})$ is the actual market aggregation, $E(Y_{Investors})$ that of investors, $E(Y_{Speculators})$ that of the speculators and $E(Y_{Retail})$ that of the retailors.

Because of difficulty in finding the weights (W_1 W_2, and W_3), the optimisation algorithm called Swam Particle Swam Optimisation (PSO) model technique, (adopted after studying the

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behaviour of schools of fish and flocks of birds), which is a type of a stochastic optimisation technique, was used to find the weights[25].

Vi(k+1) = w(k).Vi(k) + C1.R1(k).(Pbesti(k) – Xi(k)) + C2.R2(k).(Gbesti(k) – Xi(k)) (ii) Xi(k+1) = Xi(k) + Vi(k+1) ……(iii)

Where Vi(k+1) is the velocity of (k+1) th iteration of *ith* individual, Vi(k) is the velocity of kth iteration of *ith* individual, w(k) is the inertial weight used as a trade-off between global and local exploration capabilities of the swarm. The objective function for the PSO algorithm is the root mean square error obtained from equation i. The parameters are W_1, W_2 and W_3. For the gold data, the proportion of long-term investors are about 52%, short term speculators are about 41% and stochastic retail investors are about 7 %, our weights predictions are consistent with the rarely available market data[26]

The PSO algorithm is based on three principles. Given a swarm of size n., each particle Pi (i =1, 2, . . . , n) from the swarm is characterized by: 1) its current position Xi (k)∈Rd , which refers to a candidate solution of the optimization problem at iteration k; 2) its velocity Vi (k)∈Rd ;and 3) the best position Pbesti (k)∈Rd that is identified during its past trajectory. Assume the best global position found over all trajectories that are travelled by the articles of the swarm to be Gbesti (k)∈Rd. Each of n particles fly through the d-dimensional search space Rd with a velocity V (k) i, which is dynamically adjusted according to its personal previous best solution Pbesti (k) and the previous global solution Gbesti(k) of the entire swarm. The velocity updates are calculated as a linear combination of position and velocity vectors. The particles interact and move according to the following equations:

5.2 Igor's portfolio rule and investment strategies model

In his contribution to mathematics as a tool of behavioural finance, Igor V. Evstigneev focused on developing a new theory of market dynamics and equilibrium, which he believed was a plausible alternative to the classical General Equilibrium theory (Walras, Arrow, Debreu, Radner and others). The characteristic feature of his work was to combine systematic application of behavioural approaches with the evolutionary modelling of financial markets. He believed that his approach would provide answers to the fundamental questions and problems pertaining to finance and financial economics, especially those related to equilibrium asset pricing and

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portfolio selection.

He assumed A vector $\Lambda^i_o \in \Delta^k$ and a sequence of measurable functions with values in $\Delta K.\Lambda^i_t (S^t, H^{t-1})$, t = 1, 2..., form an investment strategy (portfolio rule) Λ^i of investor i.

For basic strategies, that is, those for which Λ^i_t depends only on S^t, and not on the market history Igor derived what he called portfolio rules basic thus: $H^{t-1} = (P^{t-1}, X^{t-1}, \lambda^{t-1})$. To determine investor i's demand function, given a vector of investment proportions $\lambda^i_t = (\lambda^i_t, 1..., \lambda^i_t, K)$ of investor i, the i's demand function is$X^i_t, k(P_t, X^i_{t-1}) = \alpha\lambda^i_t, KB^i_t (Pt, X^i_{t-1})$, where α is the investment rate.

Short-run (temporary) equilibrium: for each t, aggregate demand for every asset is equal to supply: $\sum^n_{i=1} = X^i_t, k(P_t, X^i_{t-1}) = V_k$, K = 1...,K.

Igor's argued that portfolio rule is called a survival strategy if the investor using it survives with probability one (irrespective of what portfolio rules are used by the other investors! He further asserted that given a strategy profile $(\Lambda^1,..., \Lambda^N)$, it can be said that the portfolio rule Λ^1 (or the investor 1 using it) survives with probability one if Inf $r^1_t \geq 0$ (a.s.),(the market share of investor 1 is bounded away from zero a.s. by a strictly positive random variable).

6. CONCLUSION

Despite its short history compared to other disciplines like economics and traditional finance it has appealed to both intellectuals and practitioners by providing a foundation for evolving theories for a deeper understanding of the psychological processes involved in financial decision-making. No single discipline can explain behaviour in the markets and the interdisciplinary nature of behavioural finance would help in structured guidelines and rule of thumb investment choices for individuals by drawing attention to potential mental mistakes, hopefully leading to increased investment returns. Irrational behaviour is demonstrated not only in security markets but also in property, bullion, and commodities markets. No 'cure' may be arrived for all the biases, but awareness about them enables players to appreciate their existence and their effect, and help them possibly avoid the major pitfalls. A major component of finance is numeracy and it would be foolhardy for one to believe that when handling decision making about it one can avoid the application mathematical or quantitative models.

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Evolution of E-Funds Transfer and its Impact on Customer Satisfaction in Uganda: a Case study of Stanbic Bank Uganda Limited

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Abstract

The purpose of the study was to trace the evolution of e-funds transfer and its impact on customer satisfaction in Uganda with Stanbic Bank Uganda Limited as the case study. A cross-sectional approach, involving collecting of data at once from employees and customers was adopted. A combination of quantitative and qualitative data analysis techniques was employed. Quantitative data analysis techniques involved the use of descriptive statistics such as frequencies and percentages to summarize responses on issues of E-transfer of funds and customer satisfaction while the Pearson's correlation coefficient was used to establish the relationship between dimensions of E-transfers and customer satisfaction as study objectives. Findings from descriptive statistics indicated that on average the respondents agreed to the statement that e-fund transfer have an effect customer satisfaction. Respondents argued that with less work hours required through e-transfers to serve customers the bank can reallocate resources to planning, policy implementation and other value enhancing bank activities. Customer touch points are user friendly. A coefficient of determination (Adjusted R Square) is 0.093 in the study implies that E-funds transfer accounts for 9.3% of the variance in *customer satisfaction*. There are therefore other factors outside E-fund transfer that contribute to the greater percentage of *customer satisfaction.*

Key words*:* Electronic, Transfer, Customer Satisfaction, E-banking, Monitoring, Data, Banks, Account, Technology, Payments

1. Introduction

As a means of enhancing competitive edge, banks have had to spend more on digital information and communication technology than other companies in the financial industry. It is for this reasons that, financial technology, Fintech, the innovative financial services using new technology tools, such as big data, cloud computing, and mobile technology has assumed a lead position in the sector. [1] One of the most notable developments in the financial services sector is

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electronic funds transfer (EFT) technology. There are numerous definitions of what electronic funds transfer (EFT) is. For example, it refers to transfer of funds initiated through an electronic terminal, telephone, computer (including on-line banking) or magnetic tape for the purpose of ordering, instructing, or authorizing a financial institution to debit or credit a consumer's account.[2] For the avoidance of doubt it has been emphasised that EFTs include, but are not limited to point-of-sale (POS) transfers, automated teller machine (ATM) transfers, direct deposits or withdrawals of funds, transfers initiated by telephone and transfers resulting from debit card transactions, whether or not initiated through an electronic terminal. **EFT** has also been defined as the electronic transfer of money from one bank account to another, either within a single financial institution or across multiple institutions, through computer-based systems and without the direct intervention of bank staff.[3]

2. Progress of Electronic Funds Transfer use in Uganda

In 1998 the Bank of Uganda, in its efforts to reduce transactions on cash basis in the country, established the National Payment System Secretariat (NPSS), with the major goal of reducing barriers to the use of electronic and non cash based payments. Subsequently, payment systems and platforms such as electronic cheque clearance, electronic funds transfer and real time gross settlement were introduced. A key result of these initiatives were agreements between commercial banks and some of the key utility providers (for example of water and electricity) enabling the payment of user charges at banks and platforms for payment of taxes to the Uganda Revenue Authority (URA). The fast-tracking of e-transfer of funds benefited from two technological developments. First was the introduction of GSM mobile phone networks in 1993, which revolutionised the way that people communicated and conducted business. Second was the widespread internet connectivity including mobile broadband and 3G networks. The combined results included reduced costs of access, variety of new platforms and systems for revenue collection, billing, payments and relatively reliable data connections.[4]

In August 2003, as a means of facilitating the provision of a variety of adequate payment instruments to the growing corporations and the corresponding increase in their transactions, Bank of Uganda implemented the Electronic Funds Transfer (EFT) method for both credit transfers and direct debits. The Bank of Uganda lauds Electronic Funds Transfer (*EFT*) as a system providing

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fast, convenient, reliable and secure domestic payment and collection of funds and in its Strategic Plan 2017-2022, it has as an objective, the reduction of the use of paper money and cheques. By end of 2018, between 75 per cent and 85 per cent of retail transactions in Uganda were being effected using cash.[5] Direct debits are being used, especially with customers authorising a bank to pay, from their account, as settlement of an obligation due to an utility services provider, as noted with utilities above. Some customers have embraced similar arrangements with providers of telephone and insurance services, among others.

In 2007, the Bank of Uganda introduced EFT system of fees payment in educational institutions, drawing samples from selected secondary schools. The Direct Debit Agreements (DDAs) with the commercial banks have been appreciated by some parents for the benefits of flexibility and convenience. Commercial Banks are expected to credit a beneficiary's account within 24 hours upon receipt of a credit transfer instruction, and to debit the payer's account within 48 hours on receipt of a direct debit instruction confirmed against a mandate [6]. With long ques experienced at the beginning of terms and semesters, school fees payment has been one of the biggest challenges for parents and students. Therefore, online payments can be adopted to solve the problem [7]. However, since its inception in 2007 by Bank of Uganda in collaboration with the commercial banks, the EFT system of paying fees in educational institutions has experienced low levels of acceptance and it has indeed faced some resistances from some parents. At the extreme some students have been removed from schools that used this system. A study carried out with regard to this matter indicated that a large proportion of parents expressed their preference towards use of old systems like bank slips, cash and some who have tried to modify use drafts [8].

In 2017, Cabinet approved The National Payment Systems Policy for Uganda. The major objective was promotion of the safety and efficiency of payment systems in the country as one of the pillars for fostering financial sector stability and economic growth. The policy gives special recognition of the use of electronic payment systems in Uganda for having dramatically enabled more people to gain access to financial services and thus the need to ensure that payment systems operate in a secure and efficient manner [9]. The number of countries gearing towards cashless economies is growing, and the most cited example is Sweden, where cash payments constituted

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only 2% of total payment value in 2015 and are expected to fall to 0.5% in 2020[10].
The realisation that e-funds transfer can greatly transform financial transaction was also recognised by other stakeholders. For example, on recognising that cash payments can be dangerous, costly, and lacking in transparency, because they are hard to track, NGOs accepted guidance of the United States Agency for International Development (USAID), to form what they called the Better Than Cash Alliance (BTC Alliance). Members of the alliance agreed to adopt electronic payments as a solution to the challenges related to transacting with cash. One such solution was mobile money. The challenges had been particularly noted with regard to issuing per diems for training participants and paying field staff.[11] The choice of mobile money technology was motivated by the very impressive success experienced between 2009, when the mobile network operator, MTN, launched mobile money services and 2012 when a case study was launched by USAID. Findings indicated that over that period subscribers registered for mobile money services rose from zero to approximately 7 million in the country. This represented nearly half (47%) of the total number of registered SIM cards. This was attributed to customer satisfaction with the safety, relatively low cost as well as efficiency of the system in sending and receiving money around the country. It is therefore not surprising that NGOs of various type have embraced electronic money transfers, notably mobile money. They have chronologically moved from in-kind aid, to cash transfers, then to digital cash transfers, with increasing intensity [12]. There is abundant evidence pointing to the fact that e-payment services, such as mobile money, offer multiple benefits, including making financial transactions more affordable, efficient and transparent. It also enhances the capacity of individuals to power their own financial future, for example with easy-to-use savings and borrowing methods [13]. By the last quarter of 2015, there were over 21.1 million registered mobile money users in the country. This represented an impressive 54% penetration. This technology of money transfer effectively spurred financial inclusion from 28% in 2009 to 54% in 2013. [14]

Table 1: Statistics for mobile operators with mobile money services in March 2015

Mobile network/ mobile money service	Mobile subscribers (millions)	Mobile money subscribers (millions)	Market share %

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MTN Uganda/MTN Mobile Money	10.4	7.3	58.4
Airtel Uganda (Warid)/Airtel Money	7.5	3.4	27.2
Uganda Telecom/M-Sente	9.8	1.3	10.4
Africell Uganda (Orange) Uganda/ Africell Uganda Money	0.6	0.5	4.0
Total	**20.5**	**12.5**	**100.0**

Source: Okwii (2015a) m http://www.dignited.com/12624/ airtel-uganda-is-leading-the-mobile-money-uganda-innovation-train/

3. Payment Systems

A payment system is a set of processes and technologies that transfer monetary value from one entity or person to another. Creativity in payment systems can create or enhance opportunities of banks to interface with current and potential customers at reduced costs, help in managing risk of system or counterparty failure as well as check on cybercrime and conventional fraud.[15]. Examples of systems that have transformed conduct of transactions are RTGS (Real Time Gross Settlement) and SWIFT (Society for Worldwide Interbank Financial Telecommunication) and the mobile wallet. The RTGS system refers to the continuous (real-time) settlement of fund transfers individually on an order by order basis (without netting). It involves the processing of instructions as soon as they are received rather than at a later time, thus the description 'Real Time.' It has been identified as being particularly relevant for large value transactions. SWIFT (Society for Worldwide Interbank Financial Telecommunication) is a bank-to-bank messaging system, and as its name implies, it is very relevant for counterparties dealing internationally. It provides a standardized language that institutions use to communicate payment instructions and other information to each other [16]. The mobile wallet (m-wallet), is an online payment system where customers can make payments online rather than having to carry cash. The wallet offers the features of convenience, speed and security, which has made it the new rage in the banking

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industry since the introduction of technology into banking services. It can be used either online or through a smart phone application. Even a person without access to bank or banking services, can easily access their accounts under this system.[17]

4 Theoretical Review

In both government and the private sector huge investments are made with the intention of introducing new technologies to assist a paradigm shift in the life style of the users. Unfortunately, many have met differing degrees of success. Major examples of disappointing projects, despite huge investments of funds, include the failed diffusion of the Electronic Health Record (EHR) and the Enterprise Resource Planning system (ERP) **[18]**

4.1 Technology Adoption Models and Theories

Over time researchers have advanced various theories on innovation and motivations for adoption, including among others, the Theory of Reasonable Action (TRA)the Theory of Planned Behavior (TPB) , the Technology Acceptance Model (TAM),Theory of Diffusion of Innovations (DIT)), Decomposed Theory of Planned Behaviour, the Technology Acceptance Model 2 (TAM2) and Technology Acceptance Model 3 (TAM3) [19] Some are discussed below.

4.2 Theory of Reasonable Action (TRA)

Ajzen Icek and Martin Fishbein's Theory of Reasonable Action (TRA) has its roots in the Persuasion Models of Psychology of the late of 1950s. It was intended to provide a theory that could predict, explain, and influence human behavior. It was developed in the field of social psychology by Ajzen and Fishbein in 1967, and like many of the models of that time it emphasised the study of the individuals' behavior through the impact of attitude as either a direct or an indirect effect on behavior, and as a result of either one-dimensional or multidimensional factor. The two viewed this theory as being moderated by two main constructs, namely, attitude toward behavior and subjective norm.

4.3 Theory of Planned Behavior

Ajzen extended TRA by a construct of perceived behavioural control. It is theorized to be an additional determinant of intention and behavior. Accordingly, Theory of Planned Behavior TPB is a composite of the main constructs of the TRA, as well as the new one, the perceived

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behavioural control.

4.4 Technology Acceptance Model (TAM)

Intended to correct the defects of the theory of reasoned action, this theory integrated aspects of expectation theory and self-efficacy theory, and is used mainly to study behavioural intentions of those who use technology. Its distinguishing aspect are the concepts of perceived usefulness and perceived ease of use, especially as they relate to the adoption of new technology by consumers. Perceived usefulness is the he degree to which a consumer using this new technology would improve the work efficiency of that consumer [20]. Several researches have indicated that consumers have tended to perceive the adoption of information technology as a means of enhancing ease and convenience in Fintechs. A bank that has better competences than another in mining and use of data to construct a user knowledge map will outcompete the lesser endowed.[21] Two major conclusions of the TAM are that there is a positive attitude toward new technology premised on intentions to adopt this technology and that there is a significantly positive correlation between users' attitudes toward a certain technology and their adoption intentions, which has been widely confirmed in the research of the banking field.[22]

4.5 Technology Acceptance Model 2 (TAM2)

It has been noted above in TAM that its distinctive aspects are the concepts of perceived usefulness and perceived ease of use. In a bid to improve the earlier TAM, Venkatesh and Davis added the subjective norm construct. Thus, the Extended Technology Acceptance Model or TAM2 [23]. A relationship exists between subjective norm and both perceived usefulness and intention of use. perceived usefulness is moderated by the user experience, and the intention of use is moderated by the user experience and voluntariness of use. Continued satisfactory experience with a good or service will reinforce its acceptance, that is, the existence of experience moderator will show the increase in the level of users' experience in technology over the time, and this will cause a tangible change in technology acceptance to them [24].

4.6 Technology Acceptance Model 3

TAM3 is a turnaround of the homological network of what determines decision to adoption and use of information technology. Unlike the TAM2 which suggested only one addition to TAM, subjective norm, TAM3 added three constructs after subjective norm , namely computer

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playfulness (the degree of cognitive spontaneity in microcomputer interactions.), perceived enjoyment(the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use) and objective usability. The comprehensive nature of the model has endeared it to academics and practitioners arguing that it provides a good basis for decision makers and managers in various fields, especially urban managers [25].

4.7 Theory of Diffusion of Innovations (DIT)

Diffusion of innovations theory was propounded by Everett Rogers and it seeks to explain how, why, and at what rate new ideas and technology spread. He argues that diffusion is the process by which an innovation is communicated over time among the participants in a social system, and that it occurs over five stages, namely, awareness, interest, evaluation, trial, and adoption. They are integral to this theory, with the possibility of the individual rejecting an innovation at any time during or after the adoption process [26].

4.8 Decomposed Theory of Planned Behaviour (DTPB)

It is an improved TPB, which in turn means it is an enhancement of TRA. In addition to the constructs of these two models, DTPB adds relative advantage, compatibility, and complexity. Relative advantage refers to the degree to which an innovation is perceived as being better than its precursor. Accordingly, (DTPB) attempts to decompose attitude toward behavior, subjective norm, and perceived behavioural control into multi-dimensional belief constructs within technology adoption contexts [27].

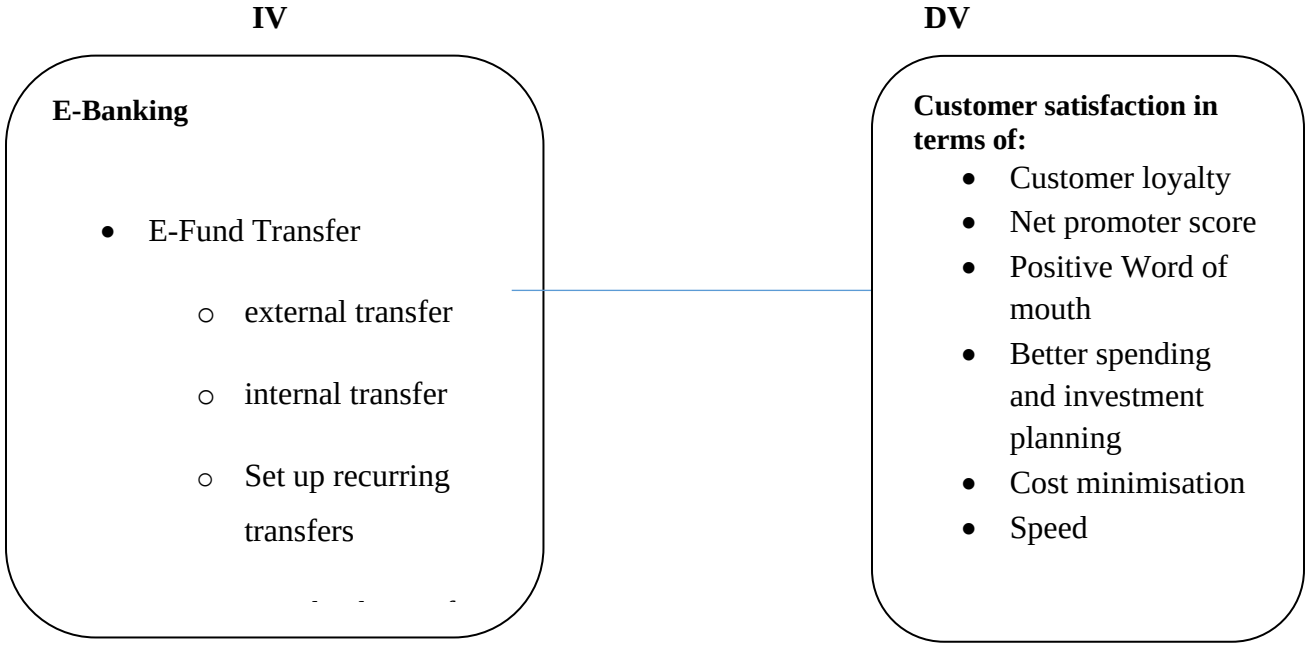
4.9 Combined TAM and TPB (C-TAM-TPB)

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Developed in 1995, the model combines features of the TPB model whose origins are in social psychology field and TAM from information technology field. Both TPB and TAM theories are premised on the assumption that behavior is determined by the intention to perform the behavior. Intention itself is determined by the attitude towards behavior. Both perceived usefulness and perceived ease of use are positively influencing on attitudes. Thus, attitudes, subjective norms and perceived behavior control are positively influencing on usage behaviours.[28]

5 Conceptual Frameworks

A conceptual framework is an interconnected set of ideas (theories) about how a particular phenomenon functions or is related to its parts and it serves as the basis for understanding the causal or correlational patterns of interconnections across events, ideas, observations, concepts, knowledge, interpretations and other components of experience.[29] The conceptual framework offers many benefits to a research. For instance, it assists the researcher in identifying and constructing his/her worldview on the phenomenon to be investigated [30]



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Source: Adapted and Modified from Shields et al, (2013)

Where: IV means Independent Variable and **DV** means Dependent Variable

There are various types of transfers. They may, among others, be external, internal, recurring, intra or interbank. Whatever the type of transfers, there are at least two parties to the transaction. At all stages time is of great essence, just as are expense control, management of all types of risks including loss through theft or fraud and currency risk, convenience and user friendliness. Use of an electronic payment system can incredibly reduce fees of transactions to 1% of the total amount chargeable by an internet service provider or a mobile account replenishment through the unattended payment terminal (UPT). As stakeholders, banks leverage e-banking and e-transfers to save operational costs, increase customer base, achieve mass customisation for e-business clientele, effectively and efficiently communicate with external publics and save time for exploring and developing non-core business. [31]

6 Methodology

In this section the researcher presents the methods and procedures for conducting this study in the following sections: research design, area of study, study population, sampling procedures, data collection methods and instruments, quality control methods, data management and processing, data analysis, and ethical considerations.

6.1 Research Design

This investigation was based on a case study of Stanbic Bank Uganda Limited Uganda Limited Head office in Kampala Capital City. The reasons of using a case study were that, it was a good source of ideas about behavior, it was a good method to study rare phenomena and it was a good method to challenge theoretical assumptions. Within this design, a cross-sectional approach was adopted. This involved collecting data at once, from employees of Stanbic Bank Uganda Limited head office in Kampala Capital City and customers.

6.2 Study Population

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The target population of this study comprised of employees in Uganda's commercial banking sector. However, the accessible population comprised of employees of Stanbic Bank Uganda Limited head office and some customers that visited the branch in the same location. According to the Head of Human Resources, Head office on crested towers was the biggest branch of Stanbic Bank Uganda Limited with over 110 employees.

6.3 Determination of Sample size

This sample size was chosen as per guidance below.

Table 1: Showing the sample size of the respondents

	Target population	**Sample size**
Managers	5	5
Middle Level staff	10	10
E-banking operative staff	5	5
Customer relationship officers	8	8
Customers of Stanbic Bank Uganda Limited.	75	63
Total	103	91

Source: Krejcie, Robert V., Morgan, Daryle W., "Determining Sample Size for Research Activities", Educational and Psychological Measurement, 1970. The study involved 5 managers, 10 Middle Level staff involved in E-banking operations, 5 Head office (Stanbic) E-banking operative staff, 8 Customer relationship officers attending walk-in-customers and 63 Customers of Stanbic Bank Uganda Limited.

6.4 Sampling techniques and Procedures

Both probability and non-probability sampling techniques were employed in the study. The probability technique of proportional stratified random sampling was used in selecting employees to participate in the study. Proportional stratified random sampling involves dividing the population into mutually exclusive and exhaustive strata, and then selecting a random sample of subjects which is proportional to size of a given stratum. The non-probability technique of

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purposive sampling was also used.

6.5 Data Collection Methods and instruments

Questionnaire and field guides were used. Questionnaire survey involved collecting quantitative data from selected employees and customers of Stanbic Bank Uganda Limited. The researcher obtained written permission from the bank's administration to interview respondents. The researcher then employed a combination of data collection methods including questionnaire survey, key informant interviews, and documentary review. Questionnaires were used because they were cost-efficient to gather quantitative data. Apart from being inexpensive and flexible, questionnaires were also a practical way to gather data. They were targeted to groups chosen and were managed very well. The major study variables were measured using structured close-ended items adopted from previous research studies and assessed using a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree. Close-ended questions were used.

6.6 Procedure of Data collection

Employees were given questionnaires and requested to fill them within a specified time period, and were collected from the respondents upon completion. Key informant interviews involved collecting qualitative data through in-depth face-to-face engagements with selected heads of department of Stanbic Bank Uganda Limited departments in the bank to compliment data obtained through questionnaire surveys.

6.7 Data Analysis

A combination of quantitative and qualitative data analysis techniques was employed in this study. Quantitative data analysis techniques involved the use of descriptive statistics such as frequencies and percentages to summarize responses. Pearson's correlation coefficient was used to establish the relationship between dimensions of E-banking and customer satisfaction as specified in the study objectives.

7.0 Presentation, Analysis and Interpretation of Results

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This section presents data collected using the questionnaire, and interviews and the corresponding interpretations according to the study objectives. The findings were arrived at by analysing and interpreting the available data using SPSS and Microsoft Excel software.

7.1 Response Rate

The total number of respondents who constituted the sample used in this dissertation are summarized below.

Table 2: Showing the Response Rate

Sample	Frequency	Percentage
Bank Employees and customer		
Response	87	96%
Non-response	4	4%
Total	**91**	**100**

Source: *Primary Data*

From table 1 above, the total of respondents was ninety-one (91) where eighty-seven (87) questionnaires were returned and all interviews were conducted. The response rate was therefore ninety-four (96%) which is highly reasonable response rate.

7.2 The Relationship between E-fund Transfer and Customer Satisfaction;

The researcher proceeded to statistically establish whether e-fund transfer positively influence customer satisfaction.

7.3. Correlation Analysis

The study tested the study question of whether e-transfers have an impact on customer satisfaction at a 95% level of significance (two-tailed) using Pearson's product-moment correlation coefficient.

Table 3: Correlation Matrix for e-fund Transfer and Customer Satisfaction;

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Correlations

		E-fund transfer	Customer satisfaction
E-fund transfer	Pearson Correlation	1	.323**
	Sig. (2-tailed)		.003
	N	82	82
Customer satisfaction	Pearson Correlation	.323**	1
	Sig. (2-tailed)	.003	
	N	82	82

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3 above shows that there is a moderate positive relationship between e-fund transfer and customer satisfaction; (r=0.323 p=0.003 n=82). The relationship is statistically significant at 95% confidence level since p-value (Sig.) is less than 0.050 (=0.000). This implies that improvements in e-fund transfer shall be related to improvements in customer satisfaction. Similarly decline in e-fund transfer shall be related to decline in customer satisfaction.

7.4 Regression Analysis

Regression analysis was used to establish the extent to which *e-fund transfer* affects *customer satisfaction*. The coefficient of determination (R Square) was used and the results are presented in the table below.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.323[a]	.105	.093	.58439	.105	9.337	1	80	.003

a. Predictors: (Constant), E-fund transfer

Table 4 above shows that the coefficient of determination (Adjusted R Square) is 0.093. This

implies that E-funds transfer accounts for 9.3% of the variance in *customer satisfaction*. There are therefore other factors outside E-fund transfer that contribute to the greater percentage of *customer satisfaction*.

7.5 Employee views on e-banking

The objective of the study was to examine the effect of e-fund transfer on customer satisfaction in Stanbic Bank Uganda Limited. The table below indicates employee views on e-banking using 7 items scored on five-point Likert scale of 1=strongly disagree, 2= Disagree, 3=Neutral, 4=Agree, 5= strongly agree.

Table 5 Employee views on e-banking

	N	SDA	DA	NS	A	SA	Mean	Std. Deviation
There is ease in external fund transfer	32		16%(5)	28%(9)	22%(7)	34%(11)	3.75	1.107
There is ease in internal fund transfer	32		3%(1)	6%(2)	34%(11)	56%(18)	4.44	.759
There is reduction fraud cases	32		3%(1)	6%(2)	38%(12)	53%(17)	4.41	.756
Ease of transfer of peer to peer funds	32		3%(1)	6%(2)	34%(11)	56%(18)	4.44	.759
Less paper work in banking halls	32		0%	3%(1)	34%(11)	63%(20)	4.59	.560
Less man hours are applied to customers	32		0%	13%(4)	38%(12)	50%(16)	4.38	.707
Resources are skewed to other bank activities	32		3%(1)	9%(3)	47%(15)	41%(13)	4.25	.762

***Source:* Field Primary Data**

Key: SD= strongly disagree, D=Disagree, NS = Not sure, A= Agree, SA=strongly agree

From table 5 above, the respondents were asked in order to find out whether, there is ease in

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external fund transfer; respondents were asked to state the extent to which they agreed with the above. There are two major results as reflected by way of standard deviations and means. First was the issue of whether there is ease in external fund transfer using e-means. The standard deviation was 1.107, accompanied by a mean of 3.75. Of the total respondents, 34% strongly agreed, while 22% agreed, 28% were neutral, while 16% disagreed and 0% strongly disagreed. This implies that the 56% of the respondents were in approval, 16% disagreed. The other major result was on the issue of whether there was lesser working paper, the standard deviation was 0.560 accompanied by the highest mean of 4.59. Of the total respondents, 63% strongly agreed, while 34% agreed, 3% were neutral, while 0% disagreed and 0% strongly disagreed. This implies that the majority, 97% of the respondents were in approval, with a mean of 4.59 and SD of 0.560. From the statistics above with 97% in agreement this is an aspect to the bank stakeholders need to uphold comparison to the 0% who were in disagreement. From the findings above this shows that to deliver on the e-banking on customer satisfaction this aspect should be keenly addressed.

In determining whether Ease of transfer of peer to peer funds, the study revealed that; of the total respondents, 56% strongly agreed, while 34% agreed, 6% were neutral, while 3% disagreed and 0% strongly disagreed. This implies that 90% of the respondents were in approval while 3% disagreed and 6% had a neutral opinion with a mean of 4.44 and SD of 0.759. From the findings above this shows that this is a key attribute which should be well managed by the bank stakeholders in Stanbic Bank Uganda Limited. In order to find out whether, less paper work in banking halls; respondents were asked to state the extent to which they agreed with the above. The above findings show that bank stakeholders have done some work to do regarding this aspect in totality. From the findings of the study the respondents were asked about less man hours are applied to customers. Of the total respondents, 50% strongly agreed, while 38% agreed, 13% were neutral, while 0% disagreed and 0% strongly disagreed. This implies that 88% of the respondents were in approval while 0% disagreed and 13 % had a neutral opinion with a mean of 4.38 and SD of 0.707 from the statistics above, this shows that this is a key attribute which should be addressed by the bank stakeholders. From the findings of the study the respondents were asked about resources being skewed to other bank activities. Of the total respondents, 41% strongly agreed, while 47% agreed, 9% were neutral, while 3% disagreed and 0% strongly disagreed. This implies that 88% of the

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respondents were in approval while 0% disagreed and 9 % had a neutral opinion with a mean of 4.25 and SD of 0.762 from the statistics above, this shows that this is a key attribute which should be addressed by the bank stakeholders.

Table 6: Customer views on e-banking

	N	SDA	DA	NS	A	SA	Mean	Std. Deviation
There is ease in external fund transfer	50	2%(1)	2%(1)	2%(1)	48%(24)	46%(23)	4.34	.798
There is ease in internal fund transfer	50	2%(1)	0%	4%(2)	46%(23)	48%(24)	4.38	.753
There is reduction fraud cases	50	16%(8)	28%(14)	44%(22)	8%(4)	4%(2)	2.56	.993
Ease of transfer of peer to peer funds	50	2% (1)	6% (3)	6%(3)	54%(27)	32%(16)	4.08	.900
Less paper work in banking halls	50		0%	2%(1)	52%(26)	46%(23)	4.44	.541
Less man hours are applied to customers	50		0%	2%(1)	52%(26)	46%(23)	4.44	.541
Resources are skewed to other bank activities	50		2% (1)	6%(3)	54%(27)	38%(19)	4.28	.671

Source:* *Field Primary Data

Key: SD= strongly disagree, D=Disagree, NS = Not sure, A= Agree, SA=strongly agree

From table 6 above, the respondents were asked in order to find out whether, there is ease in external fund transfer; respondents were asked to state the extent to which they agreed with the above. Of the total respondents, 46% strongly agreed, while 48% agreed, 2% were neutral, while 2% disagreed and 2% strongly disagreed. This implies that the 56% of the respondents were in

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approval, 16% disagreed with a mean of 4.34 and SD of 0.798. From the statistics above with 94% in agreement this is an aspect to be addressed by the bank stakeholders." in comparison to the 4% who were in disagreement. From the findings above this shows that to deliver on e-banking this aspect should be addressed.

From the findings of the study the respondents were asked if there is ease in internal fund transfer. Of the total respondents, 48% strongly agreed, while 46% agreed, 4% were neutral, while 0% disagreed and 2% strongly disagreed. This implies that 94% of the respondents were in approval while 2% disagreed and 4% had a neutral opinion with a mean of 4.38 and SD of 0.753 from the statistics above, this shows that this is a key attribute which should be well managed by the bank stakeholders in Stanbic Bank Uganda Limited. The respondents were asked whether there is reduction fraud cases. The results from the study revealed that, of the total respondents, 4% strongly agreed, while 8% agreed, 44% were neutral, while 28% disagreed and 16% strongly disagreed. This implies that the majority, 12% of the respondents were in agreement as shown by the statistics, with a mean of 2.56 and SD of 0.993. The different statistics implied that this is an aspect to be addressed by the bank stakeholders in the bank. In determining whether Ease of transfer of peer to peer funds, the study revealed that; of the total respondents, 32% strongly agreed, while 54% agreed, 6% were neutral, while 6% disagreed and 2% strongly disagreed. This implies that 86% of the respondents were in approval while 6% disagreed and 6% had a neutral opinion with a mean of 4.08 and SD of 0.900. From the findings above this shows that this is a key attribute which should be well managed by the bank stakeholders in Stanbic Bank Uganda Limited.

In order to find out whether, less paper work in banking halls; respondents were asked to state the extent to which they agreed with the above. Of the total respondents, 46% strongly agreed, while 52% agreed, 2% were neutral, while 0% disagreed and 0% strongly disagreed. This implies that the majority, 98% of the respondents were in approval, with a mean of 4.44 and SD of 0.541. From the statistics above with 97% in agreement this is an aspect to the bank stakeholders need to uphold comparison to the 0% who were in disagreement. From the findings above this shows that to deliver on the e-banking on customer satisfaction this aspect should be keenly addressed. From the findings of the study the respondents were asked about less man hours are applied to customers.

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Of the total respondents, 46% strongly agreed, while 52% agreed, 2% were neutral, while 0% disagreed and 0% strongly disagreed. This implies that the majority, 98% of the respondents were in approval, with a mean of 4.44 and SD of 0.541 from the statistics above, this shows that this is a key attribute which should be addressed by the bank stakeholders. From the findings of the study the respondents were asked about resources being skewed to other bank activities. Of the total respondents, 38% strongly agreed, while 54% agreed, 6% were neutral, while 2% disagreed and 0% strongly disagreed. This implies that 92% of the respondents were in approval while 2% disagreed and 6 % had a neutral opinion with a mean of 4.28 and SD of 0.671 from the statistics above, this shows that this is a key attribute which should be addressed by the bank stakeholders.

8 Conclusions and Recommendations

Findings from descriptive statistics indicated that on average the respondents agreed to the statement that e-fund transfer have an effect customer satisfaction. With less work hours required through e-transfers to serve customers the bank can reallocate resources to planning, policy implementation and other value enhancing bank activities. Customer touch points are user friendly. The study recommends that a similar research incorporating in other aspects like, leadership and working conditions, working and organization culture and practices among others. Future researchers can focus on looking at the other factors other than those mentioned and studied. This clearly shows a critical look at the above areas derives a holistic picture of ways and avenues affecting understanding electronic-banking and customer satisfaction.

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TOTAL OUTSOURCING AND SERVICE DELIVERY IN THE PRIVATE SECTOR: A CASE OF AFRICELL KAMPALA, UGANDA

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Abstract

The importance of outsourcing to modern business cannot be overemphasized. Outsourcing helps business firms and individuals worldwide to obtain specialized services which would not be cost efficient for them to provide. Hence, this study examined the effect of selective outsourcing and total outsourcing or service delivery in Africell Kampala, and the study employed a descriptive correlational and cross sectional survey research design. A sample of 168 respondents was determined from 290 target population. Both qualitative and quantitative approaches were adopted to analyze data collected through questionnaire. The results of qualitative analyses using frequency and percentage distributions, means and standard deviations show majority of the respondents were females (58.3%) while 41.7% were male; majority of respondents (67.9%) were aged between 28-37 years, whereas minority of the respondents aged 58 years and above; and majority of the respondents (31.0%) had been in their line of work for a duration of 6 – 10 years. The results further show that the respondents agree that that outsourcing firms are professionals, respond to issues immediately and are flexible in service provision; and that selective outsourcing would enhance performance of Africell Kampala Uganda. The result of quantitative analyses using Pearson's Linear Correlation Coefficient revealed that there is a significant positive relationship between selective outsourcing and service delivery (r=.368, sig=.000). The study however, did not find a significant relationship between total outsourcing and service delivery (r=-.105, Sig=.175). It was concluded that selective outsourcing enables organizations significantly transform their operations in line with the objectives for which a given outsourcing vendors was selected. The companies improve their service delivery, improve and expand activities that generate revenue, minimize the effort spent on maintaining the infrastructure that support the core of the business, exploitation of the skills and technology.

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***Keywords**; Total Outsourcing, Service Delivery, Customer Satisfaction, Africell Kampala.*

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1. Introduction

Outsourcing originally started thousands of years ago, Blaxill, Mark and Eckardt, Ralph (2009). When societies began to form, individuals began to develop specialized skills, certain tasks were given to these individuals, and thus outsourcing was born. Today, outsourcing is an important part of the business world because it helps businesses and individuals worldwide come together to serve customers more efficiently.

Man realized the need for outsourcing thousands of years ago, and how it would be impossible for them to fulfill all their needs by themselves without depending on someone else to service the, Herman and Loriana (2010). The service provider possessed specialized skills, which enabled him to do the work faster, cheaply and more efficiently. As such in early societies, every man had a part to play. He could be a father, merchant, soldier or barber, Gamoiski (1988).

The great industrial revolution (1900-1950) that took place in Europe provided much impetus to the development of outsourcing, Ashton, Thomas (1948). The period saw a manifold increase in the production of goods; the market widened and profits were like never before. Many companies began to outsource such activities like accounting, insurance, engineering and legal needs to specialized firms. These firms were within the country and not offshore. At this point of time, outsourcing was exploitative ad ugly, for instance, the Indian farmers were forced to provide raw materials like cotton and indigo for British companies, instead of food crops which were in high demand at the time. Megad (2000), emphasized that outsourcing results to increased employment and income levels of farers. The education and skill levels too improved. The governments in these countries took care to develop adequate infrastructure necessary for manufacturing companies to maximize profits.

Conceptually outsourcing and service delivery constitutes the broad concept of the study. Bucki (2012), defines outsourcing as any task, operations, job or process that could be performed by employees within an organisation on or offsite, but instead contracted to third party or an independent organisation and ceasing to perform that function or process internally. Hadfield (2006), opined that outsourcing can be defined as the strategic use of outside sources to perform

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activities traditionally handled by internal staff and resources sometimes known as "facility management."

In this study, outsourcing was understood as full and selective purchases of products or services from an outside supplier, while service delivery was understood as efficiency and customer satisfaction. To this end, service delivery is a combination of capability to deliver on the promises that were made, people deliver the work required on time and quality, customers that appreciate what is being delivered, internal organizations and a degree of excellent to meet customer's expectations.

Outsourcing is an emerging concept presently adopted by manufacturing and multinational organisations in Uganda, with notable examples of organisations like East African Breweries Limited (EABL), Crown Beverages Limited, Sheraton Hotels, Mukwano Industries and MTN Uganda. These companies are said to outsource with the objectives to improve capacity, timelines and quality and cut down costs all of which are key elements to quality service delivery.The desire to deliver quality service beyond the expectation of the customer is Africell Uganda's reason for outsourcing most of its operations in the network and IT department, security, marketing among others.

Companies may lose management and control of certain business functions, thus being unable to manage the entity as effectively desired problems with quality can arise if the outsourcing provider does not have proper processes and or is inexperienced in working in an outsourcing relationship. Furthermore, some outsourcing providers may work with other customers, hence might not give 100% time and attention to a single company, which may result in delays and inaccuracies in the work outside. These constraining factors, infringed the researcher to undertake a study into Africell's service delivery amid growing concerns among the company's customers over its declining quality, among other complaints.

Despite all efforts by Africell to improve its performance, poor service delivery has persisted. There us persistent poor network quality, and according to Uganda Commissions Commission survey (2014), Africell Kampala Uganda exceeded the maximum 3.3% blocked and 2.5% drop call rates and blocked due to network failure and premature termination respectively. The network

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quality is also characterized by persistent outages, congestion and heavy interruption that have left subscribers frustrated and the company unable to maximize its potential as well as achieve its promises in terms of time lines, reliability and profitability. If these problems continue, Africell Kampala Uganda will lose its valuable customers according to Uganda Communications Commission survey (2014).

The purpose of the study was to establish the effect of Total outsourcing on service delivery at Africell Kampala, Uganda with specific objectives of establishing the relationship between selective outsourcing and service delivery, and also investigate the relationship between total outsourcing and service delivery at Africell Kampala Uganda.

2. Conceptual and Theoretical Review

Conceptually outsourcing and service delivery constitutes the broad concepts of the study. According to Webster New International Dictionary (1993), outsourcing is an act of a company or organization to purchase goods or sub contract (services) to an outside supplier or source. In other words, it seeks to contract out Jobs, services etc. as the means of obtaining goods or services from an outside source.

Bucki (2012) defines outsourcing as any task, operations, job or process that could be performed by employees within an organization on or off site, but is instead contracted to a third party for an independent organization and ceasing to perform that function or process internally.

According to Hadfield (2006), outsourcing can be defined as the strategic use of outside source to perform activities traditionally handled by internal staff and resources sometimes known as "facility management. Outsourcing can be defined as a strategy by which organization contractors out some of its major functions to specialized and efficient service providers, who become valued business partners. Companies have always hired contractors for particular types of work or to levels off peaks and term relationships with firms whose capabilities complement or supplement their own.

In this study outsourcing was understood as full and selective purchases products or services from outside supplier, while service delivery was understood as efficiency and customer satisfaction. To this end, service delivery is a combination of capability to deliver on the promises that were made,

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people deliver the work required on time and quality customers that appreciate what is being delivered, internal organization and a degree of excellence to meet customers' expectations.

The study was guided by the Transaction cost theory (TCT). According to Ronald Coase, people begin to organize their production in firms when the transaction cost of coordinating production through the market exchange, given imperfect information, is greater than within the firm.

3. Empirical Review

According to Murray and Kotabe (1999), Total Outsourcing is the process of Outsourcing 100% of business operations to an outside vendor. Bravard and Morgan (2006) claim the total outsourcing involves transferring more than 80% of the organizations function to a vendor. Total outsourcing increases profitability and reliability. It is possible that total Outsourcing companies increase their liquidity through injection of cash from Liquidation of redundant assets or proceeds from assets transfer of service providers.

Klepper and Wendell (2008) illustrated that total Outsourcing is a major undertaking and no organization should do it without considerable thoughts. In fact organizations that enter into Out Sourcing arrangements will spend considerable time, effort and money analyzing the deal before entering into contract with any vendor. In other words, organizations entering total Outsourcing arrangements would never undertake it lightly.

Current competitive environment induced by globalization and advances in information technology have forced companies to focus on service delivery, and in particular customer satisfaction and customer loyalty in order to efficiently maximize revenues. In the age of customer delivering quality service, it is considered an essential strategy for success and survival in today's competitive environment (Scott Armstrong and Kesten C. Greene, 2007). The focus of any business system is to provide all customers with the level of service delivery they require and as no budget is unlimited.

Zlad Dalloul (2004), in a report on Africell Kampala Uganda mentioned that the some management of Africell networks has been outsourced by Huawei, Seagate Co LTD Uganda telecom, IT and customer care to Vodafone, Payroll to Deloitte. All its cleaning services out sourced to Dream clean executive cleanliness and all its catering services to sunset restaurant.

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This was done to achieve increased profitability time lines and deliver quality services to its stake holders, employees and customers most importantly. Furthermore companies have increasingly turned to total outsourcing in order to reduce costs and improve service delivery in Uganda. However, Outsourcing is yet to be fully practiced as in other economies of the world. Today only a few local organizations are Outsourcing and none seems to have totally outsourced its operations.

In the recent years, there has been a significant shift in the balance of power between the consumers and the organizations providing those products or services. Business the world over is struggling for competitiveness in a rapid globalizing economy. The heat of competition is being felt in all areas of the economy. Due to the competitive pressure, corporations started outsourcing non-core operations to outsiders who are experts in doing that job with efficiency, effectiveness and at reduced cost (Sople, 2004). An increasing number of business functions are being outsourced. To meet competitive challenges, corporations are outsourcing to highly specialized firms that can use their expertise to increase the efficiency of an outsourced function. The increase in outsourcing has resulted in lower staffing levels, reduced costs, and more flexibility.

Quinn (2001) claimed that extensive Outsourcing is becoming more and more compelling, across the commercial spectrum indeed when properly developed Outsourcing substantially lowers costs, risks and fixed investment while greatly expanding flexibility, innovative capabilities and opportunities for catering higher value added and stake holder returns.

Elmuti and Kathawala (2000) argue that outsourcing provides institution with opportunities to add more experts to their resource pool hence chances of increasing innovative performance may improve.

Flows (1998), claims that processing clients orders is a critical function in any sales cycle completing customer orders in a timely manner is one of the things that strengthen client relationships and helps build new ones. Flows further states that whether selling products or providing services, it is necessary to process customers' requests quickly.

In such a competitive environment, those offering better customer services, faster order processing and the timely delivery of services will eventually increase and maintain their customer base, in

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support of the above Outsourcing can undoubtedly bring tremendous benefits to organizations. In the case of order processing specifically, organizations can strengthen relationships with existing clients and easily build new ones by providing a constant and efficient service that deals with the timely processing of orders.

4. Methodology

The study was conducted using a descriptive correlational survey and cross sectional design. As recommended by Amin (2005), the design involved collecting data from a large sample of respondents (168) at one point in time, without influencing it in any way. The study also involved correlating the descriptive data to establish the relationship between the independent variables (selective outsourcing and total out sourcing) and dependent variables (efficiency and customer satisfaction). The study mainly took a quantitative approach despite the fact that there are some aspects of qualitative nature. The quantitative aspects of the study aimed at measuring and analyzing variables with statistical procedures (Bakkabulindi, 2008).

5. Results and Discussions

One sample statistics:

Questions on Total Outsourcing	Mean	Std. Dev.	Interpretation
To improve on performance all network services should be outsourced	1.9881	.72581	poor
For better performance all IT technical staff is outsourced	1.7083	.85719	poor
All marketing services are outsourced for better performance	1.8333	.82380	poor
All activities of the organization are outsourced to improve on the performance	2.2262	.93950	poor
Major tasks of Africell are outsourced for better performance	2.1429	.93684	poor
Average	**1.97976**	**0.856628**	**Poor**

Source: Primary Data

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As revealed by the findings in the table above, most of the respondents agreed with most of the items that were examined. The first ranked items that were examined. The first item was that "To improve on performance all network services should be outsourced" (mean=1.9881, Std. Dev. =.72581 and rank=1). This was interpreted as poor. Secondly the respondents disagreed with the items and this was that" For better performance all IT technical staff is outsourced" (mean=1.7083, Std. Dev. =.85719 and rank=2). This item was interpreted as poor with the overall average 1.97976 and also interpreted as poor. The third ranked item was that "All activities of the organization were outsourced to improve on the performance" (mean= 2.2262, Std. Dev. =.93950 and rank = 4). This mean was interpreted as poor. The fourth ranked Item was "All marketing services are outsourced for better performance" (mean=1.8333, Std. Dev. = .82380 and rank= 3). This was interpreted as poor. Lastly the last item was that" Major tasks of Africell are outsourced for better performance" (mean= 2.1429, Std. Dev= .93684 and rank= 5). This was interpreted as poor. Generally, the respondents do not agree that total outsourcing could enhance performance of Africell Kampala Uganda.

6. Discussions of findings

The results showed that there is no significant relationship between total outsourcing and service delivery at Africell Kampala Uganda. These results are contradictory with most studies, because they found significant positive relations ship between outsourcing and performance. Elmuti and Kathawala (2000) argue that outsourcing provides institution with opportunities to add more experts to their resource pool hence chances of increasing innovative performance may improve.

Total out sourcing does not have a significant relationship with service delivery. Total outsourcing cannot be used as a strategy to improve on service delivery. If all core and noncore services are out sourced, the company may not have effective control of it activities. This makes it not to develop competence internally.

7. Conclusions and Recommendations

Outsourcing can enhance customer experience through between quality of service board the best

people across the globe to manage networks , get access to least technology expertise and processes leading to improved productivity, reliability and affordability. In simpler terms, outsourcing enables organization deliver seamless customer experience, higher customer satisfaction and more profitable growth. From the study findings, the following recommendations were offered;

Managers of business organizations should use selective outsourcing as the best strategy to enhance service delivery in their organization. Organizations should only outsource some services or tasks from contractors while the rest should be performed by the staff of the organization internally. This will result in increased efficiency and customer satisfaction.

When using selective outsourcing, core services should not be outsourced; they are the backbone of the company. Core activities are the very sensitive activities which require the organization itself to handle.

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SELECTIVE OUTSOURCING AND SERVICE DELIVERY IN THE PRIVATE SECTOR: A CASE OF AFRICELL KAMPALA, UGANDA

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ABSTRACT

The importance of outsourcing to modern business cannot be overemphasized. Outsourcing helps business firms and individuals worldwide to obtain specialized services which would not be cost efficient for them to provide. Hence, this study examined the effect of selective outsourcing and total outsourcing or service delivery in Africell Kampala, and the study employed a descriptive correlational and cross sectional survey research design. A sample of 168 respondents was determined from 290 target population. Both qualitative and quantitative approaches were adopted to analyze data collected through questionnaire. The results of qualitative analyses using frequency and percentage distributions, means and standard deviations show majority of the respondents were females (58.3%) while 41.7% were male; majority of respondents (67.9%) were aged between 28-37 years, whereas minority of the respondents aged 58 years and above; and majority of the respondents (31.0%) had been in their line of work for a duration of 6 – 10 years. The results further show that the respondents agree that that outsourcing firms are professionals, respond to issues immediately and are flexible in service provision; and that selective outsourcing would enhance performance of Africell Kampala Uganda. The result of quantitative analyses using Pearson's Linear Correlation Coefficient revealed that there is a significant positive relationship between selective outsourcing and service delivery (r=.368, sig=.000). The study however, did not find a significant relationship between total outsourcing and service delivery (r=-.105, Sig=.175). It was concluded that selective outsourcing enables organizations significantly transform their operations in line with the objectives for which a given outsourcing vendors was selected. The companies improve their service delivery, improve and expand activities that generate revenue, minimize the effort spent on maintaining the infrastructure that support the core of the business, exploitation of the skills and technology.

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Keywords; Selective Outsourcing, Service Delivery, Customer Satisfaction, Africell Kampala.

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8. Introduction

Outsourcing originally started thousands of years ago, Blaxill, Mark and Eckardt, Ralph (2009). When societies began to form, individuals began to develop specialized skills, certain tasks were given to these individuals, and thus outsourcing was born. Today, outsourcing is an important part of the business world because it helps businesses and individuals worldwide come together to serve customers more efficiently.

Man realized the need for outsourcing thousands of years ago, and how it would be impossible for them to fulfill all their needs by themselves without depending on someone else to service the, Herman and Loriana (2010). The service provider possessed specialized skills, which enabled him to do the work faster, cheaply and more efficiently. As such in early societies, every man had a part to play. He could be a father, merchant, soldier or barber, Gamoiski (1988).

The great industrial revolution (1900-1950) that took place in Europe provided much impetus to the development of outsourcing, Ashton, Thomas (1948). The period saw a manifold increase in the production of goods; the market widened and profits were like never before. Many companies began to outsource such activities like accounting, insurance, engineering and legal needs to specialized firms. These firms were within the country and not offshore. At this point of time, outsourcing was exploitative ad ugly, for instance, the Indian farmers were forced to provide raw materials like cotton and indigo for British companies, instead of food crops which were in high demand at the time. Megad (2000), emphasized that outsourcing results to increased employment and income levels of farers. The education and skill levels too improved. The governments in these countries took care to develop adequate infrastructure necessary for manufacturing companies to maximize profits.

Conceptually outsourcing and service delivery constitutes the broad concept of the study. Bucki (2012), defines outsourcing as any task, operations, job or process that could be performed by employees within an organisation on or offsite, but instead contracted to third party or an independent organisation and ceasing to perform that function or process internally. Hadfield (2006), opined that outsourcing can be defined as the strategic use of outside sources to perform

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activities traditionally handled by internal staff and resources sometimes known as "facility management."

In this study, outsourcing was understood as full and selective purchases of products or services from an outside supplier, while service delivery was understood as efficiency and customer satisfaction. To this end, service delivery is a combination of capability to deliver on the promises that were made, people deliver the work required on time and quality, customers that appreciate what is being delivered, internal organizations and a degree of excellent to meet customer's expectations.

Outsourcing is an emerging concept presently adopted by manufacturing and multinational organisations in Uganda, with notable examples of organisations like East African Breweries Limited (EABL), Crown Beverages Limited, Sheraton Hotels, Mukwano Industries and MTN Uganda. These companies are said to outsource with the objectives to improve capacity, timelines and quality and cut down costs all of which are key elements to quality service delivery.The desire to deliver quality service beyond the expectation of the customer is Africell Uganda's reason for outsourcing most of its operations in the network and IT department, security, marketing among others.

Companies may lose management and control of certain business functions, thus being unable to manage the entity as effectively desired problems with quality can arise if the outsourcing provider does not have proper processes and or is inexperienced in working in an outsourcing relationship. Furthermore, some outsourcing providers may work with other customers, hence might not give 100% time and attention to a single company, which may result in delays and inaccuracies in the work outside. These constraining factors, infringed the researcher to undertake a study into Africell's service delivery amid growing concerns among the company's customers over its declining quality, among other complaints.

Despite all efforts by Africell to improve its performance, poor service delivery has persisted. There us persistent poor network quality, and according to Uganda Commissions Commission survey (2014), Africell Kampala Uganda exceeded the maximum 3.3% blocked and 2.5% drop call rates and blocked due to network failure and premature termination respectively. The network

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quality is also characterized by persistent outages, congestion and heavy interruption that have left subscribers frustrated and the company unable to maximize its potential as well as achieve its promises in terms of time lines, reliability and profitability. If these problems continue, Africell Kampala Uganda will lose its valuable customers according to Uganda Communications Commission survey (2014).

The purpose of the study was to establish the effect of outsourcing on service delivery at Africell Kampala, Uganda with specific objectives of establishing the relationship between selective outsourcing and service delivery, and also investigate the relationship between total outsourcing and service delivery at Africell Kampala Uganda.

9. Conceptual and Theoretical Review

Conceptually outsourcing and service delivery constitutes the broad concepts of the study. According to Webster New International Dictionary (1993), outsourcing is an act of a company or organization to purchase goods or sub contract (services) to an outside supplier or source. In other words, it seeks to contract out Jobs, services etc. as the means of obtaining goods or services from an outside source.

Bucki (2012) defines outsourcing as any task, operations, job or process that could be performed by employees within an organization on or off site, but is instead contracted to a third party for an independent organization and ceasing to perform that function or process internally.

According to Hadfield (2006), outsourcing can be defined as the strategic use of outside source to perform activities traditionally handled by internal staff and resources sometimes known as "facility management. Outsourcing can be defined as a strategy by which organization contractors out some of its major functions to specialized and efficient service providers, who become valued business partners. Companies have always hired contractors for particular types of work or to levels off peaks and term relationships with firms whose capabilities complement or supplement their own.

In this study outsourcing was understood as full and selective purchases products or services from outside supplier, while service delivery was understood as efficiency and customer satisfaction. To this end, service delivery is a combination of capability to deliver on the promises that were made,

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people deliver the work required on time and quality customers that appreciate what is being delivered, internal organization and a degree of excellence to meet customers' expectations.

The study was guided by the Transaction cost theory (TCT). According to Ronald Coase, people begin to organize their production in firms when the transaction cost of coordinating production through the market exchange, given imperfect information, is greater than within the firm.

10. Empirical Review

Service delivery is a set of components that provide service delivery architecture (such as service creation, session control and protocols) for a type of service. Service delivery often requires integration of telecommunication and information technology capabilities and the provision of services that are unmatched in the industry (Burnes 2004).

Experience elsewhere, shows that there is a relationship between work methods and performance in service delivery. It is imperative that for the service to deliver the desired outputs, it needs to strive to look or encourage better ways of performing the delivery process. Service organization may not necessarily directly deliver the service but much as a matter of policy such as outsourcing should develop benchmark processes that are effective and efficient in delivery of services (Cornner, 2004).

To Kakabadese (2002) Outsourcing is a strategic decision of a company to use an outside organization to perform work that would be typically done within the company. To Marray and Kotabe (1999) Outsourcing is a process that occurs when a company purchases product or services from an outside supplier, rather than performing the same work within its own facilities in order to cut costs.

According to Gilley and Rasheed (2000) given the diverse nature of business process a firm has to manage today, it is nearly impossible for a firm to manage all of its processes by solely depending on its own resources. Even if it is feasible, the firm may lose focus efficiency hence Outsourcing some or all of its non-core business processes to enable such a firm to focus on core competences rather than services that fall outside its expertise. This cannot only improve function effectiveness and flexibility by accessing a support network with highly qualified and specialized man power, but also helps firms control their costs and business risks by transforming highly fixed costs to

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predictable expenditures. Like traditional selection processes, the Outsourcing process includes all the steps of planning, selection and managing service providers.

Selective outsourcing involves outsourcing only part of an activity and performing the rest of the activity in-house. Selective outsourcing is generally more successful than total outsourcing for two main reasons. First, companies that outsource an entire activity tend to be constrained in their ability to control the supplier. This means that companies that outsource an entire activity no longer have a sufficient level of expertise in-house to control or manage their supplier. Second, when companies perform a part of the activity in-house, they have access to the operational knowledge and information required to design effective reporting systems. Hence, it is far more difficult for the supplier to behave opportunistically (Quinn, 2001).

In comparison with purchasing or contracting out, Outsourcing differs in the strategy that drives it. In general, it is a strategy that allows companies to focus their talent and resources on improving and expanding activities that generate revenue, minimizing the effort spent on maintaining the infrastructure that supports the core of the business while also exploiting the skills and technology of some suppliers to strengthen their core competency as well as maintain their non-core activities (Murray & Kotable, 1999).

In view of the above, driven by the notion that a single vendor cannot process world-class capacities in all areas of business, this has forced many companies to embark on selective out sourcing of multiple vendors. Selective outsourcing involves outsourcing only part of an activity and performing the rest of the activity in house. Selective outsourcing is generally successful among organizations because it allows companies to perform part of their activities in house, hence gaining access to the operational knowledge and information required to run the activity.

Furthermore, through selective outsourcing, firms can save on capital investments and thus reduce on financial risks (Gilley & Rasheed, 2000). Watson (2006) claimed that organizations selectively outsource in search of expertise in certain areas of their operations in order to improve their overall performances. However, the increased level of focus on cost reduction, efficiency, customer satisfaction and festiveness has elevated outsourcing companies to a strategic level of value creation and competitive advantage.

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In Uganda, Africell first selectively outsourced some of its core operations by contracting Huawei, Seagate Co LTD, Uganda Telecom (UTL) network and IT in Uganda to handle its network operations with the help of the signal boosters and as its back born (2014). However the Gambia and Sierra Leon network known as Hits telecom holdings giant that has since taken over orange Uganda and then to Africell Uganda, the company has out sourced office supplies, travel catering services, temporary labour, security, printing services and facilitates management. In addition Africell Uganda has most recently decided to outsource part of its core business activities like promotions in order to increase timelines quality and profitability.

11. Methodology

The study was conducted using a descriptive correlational survey and cross sectional design. As recommended by Amin (2005), the design involved collecting data from a large sample of respondents (168) at one point in time, without influencing it in any way. The study also involved correlating the descriptive data to establish the relationship between the independent variables (selective outsourcing and total out sourcing) and dependent variables (efficiency and customer satisfaction). The study mainly took a quantitative approach despite the fact that there are some aspects of qualitative nature. The quantitative aspects of the study aimed at measuring and analyzing variables with statistical procedures (Bakkabulindi, 2008).

12. Results and Discussions

One sample statistics:

Questionnaires on selective outsourcing	Mean	Std. Dev.	Interpretation
For better performance only some activities/ tasks are outsourced	3.7798	1.27352	Good
Very sensitive departments of the organization are outsourced for effective performance	3.3631	1.42445	Good
Some non-technical and technical services are outsourced by this organization	3.4524	1.29859	Good
Very sensitive tasks of the organization are outsourced	3.1845	1.36527	Good

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Average	**3.44495**	**1.3404575**	**Good**

Source: Primary data

According to the findings in the table above, (mean=3.7798, Std Dev.=1.27352), most of the respondents agreed with the items that "For better performance only some activities/tasks are outsourced "This item was interpreted as implying that respondents did not have challenges while carrying out the research and this was good. The second rated item was that "Very sensitive departments of the organization are outsourced for effective performance (mean = 3.3631, Std. Dev. =1.42445), which the respondents rated as good. The third question was whether "Some non-technical and technical services are outsourced by this organization". This item was also interpreted as Good, with the mean level of (mean=3.4524, Std. Dev. = 1. 29859), the respondents believe that it is not easy for them to gain good service deliveries implying that it is cost-effective to outsource some technical services in the firm. Furthermore, the respondents agree that very sensitive services should be outsourced for effective performance, with mean = 3.1845 and Std. Dev. =1.36527. Generally, the respondents believe that selective outsourcing would enhance performance of of Africell Kampala Uganda.

Discussion of findings

The study revealed that selective outsourcing has a significant weak positive relationship with service delivery at Africell Kampala Uganda. This is in line with Harris, (2003) who found out that there existed a positive correlation between factors of outsourcing of noncore services influencing organizational performance. Akewushola and Elegbede (2012) found that outsourcing has operational advantages such as increased efficiency as a result of activities being carried out by specialized firms, and reduction in permanent staff, which then became variable costs related to the level of activity. Further, Nordin (2008) asserts that outsourcing of some value chain activities can generate operational efficiency by reducing capital investment and commitment as well as ensuring maximum utilization of the existing resources in a way that generates maximum value from the least possible inputs. Therefore, if done well, the strategic outsourcing relationship

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can result in increased operational efficiency in service delivery.

Greer et.al, (1999) also noted selective outsourcing business operations and processes usually inevitable in instances where a specific firm has no knowledge or skills for performing the task within the organization. Besides, company can also outsource in order to minimize workload, attain financial economies, increase ability to focus on core competencies and strategic issues, access to technology and specialized expertise, ability to demand measurable and improved service levels, and achieve competitive advantage

7. Conclusions and Recommendations

The study concludes that selective outsourcing has a positive significant effect on service delivery in Africell Uganda. Selective outsourcing is a strategy through which organizations can resort in order to reduce costs and improve service delivery. It can enable organizations to concentrate on their core competencies and at the same time reach the market with the most efficient and cost effective services guaranteeing continued success for the firm and the best on the market products for customers.

Outsourcing can enhance customer experience through between quality of service board the best people across the globe to manage networks , get access to least technology expertise and processes leading to improved productivity, reliability and affordability. In simpler terms, outsourcing enables organization deliver seamless customer experience, higher customer satisfaction and more profitable growth. From the study findings, the following recommendations were offered;

Managers of business organizations should use selective outsourcing as the best strategy to enhance service delivery in their organization. Organizations should only outsource some services or tasks from contractors while the rest should be performed by the staff of the organization internally. This will result in increased efficiency and customer satisfaction.

When using selective outsourcing, core services should not be outsourced; they are the backbone of the company. Core activities are the very sensitive activities which require the organization itself to handle.

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Intercultural Management Practice: The Effect on selected Organizations in Nigeria

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ABSTRACT

The need for Nigerian organizations to pay attention to intercultural management practices have become necessary following the challenges posed by cultural diversity in workplace. Hence, management needs to pay strict attention to the diverse workforce. The main objective of the study is to investigate effect of Intercultural Management practices in Nigerian organizations. It specifically examined the effect of managerial behavior on intercultural management and impact of culture on organizational performance. It purely employed primary sources of data collection. The finding revealed that managerial behaviors have effect on intercultural management in Nigerian organizations and also culture has impact on organizational performance. It was recommended that management of various organizations in Nigeria should establish structures in their organization that will encourage good ethical behavior of all levels of managers and even employees as this has significant effect on the organizational performance.

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KEYWORDS: Intercultural Management, Managerial Behavior, Culture, Practices, Organizational Performance.

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INTRODUCTION

In recent times, there has been growing recognition for contemporary managers to develop a universal focus to management practices as narrow view is inappropriate due to diversity in culture which often time poses some serious challenges for managers in today's organization. Approaches, perceptions, practice and concept of management, differ in various cultures. As a result of the globalization of business operations, with its attendant culturally diverse workforce, there is the need to pay attention to the roles and effect of intercultural aspect of management in organizations. Hence, it is pertinent for managers to instill social cultural issues in management practices, opportunity to enter into, contribute to, and learn about a new culture, present an opportunity to learn new ways of thinking about the management of people, resources and processes in organization, about working with and through people across a range of national and international business and management backgrounds, in order to enable management professionals clearly identify with the effect of different cultural values on management and leadership styles in different cultures globally. Hicks and Gullet (2012) observe that a general applicability of management fundamental is culture bound as many applications on organization and leadership were inappropriate to local situations, as the native culture and personality play a significant role in organizational success.

STATEMENT OF THE PROBLEM

Cultural differences do affect managerial behavior and practices such as planning, organizing, staffing and controlling. It is unquestionable that culture influences management practices mainly through motivation, respect, reward system, promotion and authority (Bagwell, Kyle, and Ramey, Garey 2015). Ewanlen, Ogendengbe & Rebman (2017), posit that the way of doing things in one culture may not always be the same in another country. Hence, what is good in one culture may be bad in another, as people tend to act, perceive, see things and do things in different ways, at different time and at different places. Ewanlen et al (2017) further asserts that Cultural differences do affect managerial behavior and practices such as planning, organizing, staffing and controlling. In line with this view, Donnelly, Gibson & Ivancevich, (2014) affirm that Culture also affects

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interpersonal relations as seen in negotiation; hence it is essential that being aware of cultural difference is a prerequisite for personal and organizational success. However, Schein (2012) opined that organizational culture is even more important today than it has been in the past due to increased competition, globalization, mergers, acquisition, takeovers, alliances and various workforce development which have created a greater need for coordination and integration across organizational units in order to improve efficiency, quality, and speed of designing, manufacturing and delivering product and services, product strategy and process innovation and ability to successfully introduce new technologies, such as information technology, effective management of dispersed work unit and increasing workforce diversity, and managing of workforce diversity facilitation and support teamwork. In the same vein, Dasanyaka and Mahakalanda (2018) note that there is greater need to adapt to external and internal changes of organizational culture because it has become imperative today as the world is moving towards knowledge based economy. Maximizing the values of employees as intellectual assets requires a culture that promotes their intellectual participation and facilitates both individual and organizational learning, new knowledge creation and application, and the willingness to share knowledge with others (Dasanyaka and Mahakalanda 2018).

OBJECTIVES OF THE STUDY

The main objective of the study is to investigate intercultural management effect on Nigerian organizations.

The specific objectives are as follows:

1. To examine the effect of managerial behavior on intercultural management in Nigeria organization;

2. To examine the impact of culture on organizational performance**.**

RESEARCH QUESTIONS

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(1) To what extent does managerial behavior effect has on intercultural management on the organization under study?

(2) How does culture enhance organizational performance in the organization under study?

RESEARCH HYPOTHESIS

(1) H_o: Managerial behavior has no significant effect on intercultural management

(2) H_o: Culture has negative impact on organizational performance

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REVIEW OF RELATED LITERATURE

2.1 Basic Definitions and Concepts of Intercultural Management

Adler (2011) defines intercultural management as the description, comparison and interaction of organizational behavior within countries and cultures, organizational behavior across countries and cultures; and between co-workers and other people from different countries and cultures.

According to Ewanlen et al (2017), Intercultural management is the study of the behavior of people in organization located in cultures and nations around the world. It focuses on the description of organizational behavior within countries and cultures, on the comparison of organizational behavior across countries and cultures and most importantly, on the interaction of people from different countries working with the same organization or within the same environment. Ewanlen et al (2017), note further that the implication is that often time different meanings, interpretations may be given to similar activities in two different cultures but the diverse nature of the workforce accounts for the variations of interpretation given to employee behaviors depending on its cultural setting.

Intercultural management mainly deals with concepts such as values, attitudes, assumptions, behavior and organizational outcomes such as motivation (Steers & Sanchez-Runde, 2012). Some other concepts employed in intercultural management are derived from social psychology, sociology, anthropology: cognition, perception and attributions. Some of these concepts are most relevant and they include *Cognition, perception, attribution, attitudes, Values norms and rules.*

Lahey, (2013) state that Cognition encompasses the intellectual processes through which information is obtained, transformed, stored, retrieved, and used. Gudykunst (2016) posit that perception may be defined as our awareness of what is taking place in the environment or as one's experience of an event or the process by which a person senses reality and comes to a particular understanding or view. Gudykunst (2016) define attributions as the attempts made by people to explain

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others' behavior. In other words, attribution signifies determining why events occur and the reason may be either *personal* or *situational*.

Adler, (2011) observe that attitudes are formed through direct, personal experience, genetic and physiological factors, and third determinants like parents and groups, and mass media, and can, but are not necessarily predictive of behavior. Unlike attitudes, Hofstede (2015) identify that *values* are general in nature; they do not focus on a specific event, but they cover many attitudes. Rokeach, (2011) defines values as enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence. Hofstede (2015) further explain that values as broad tendency which exhibited by people to prefer certain states of affairs over others. Gudykunst (2016), state that *Norms* are guidelines of how we should or should not behave. They have a basis in morality. According to Hofstede (2015), *rules* are guidelines for the ways we are expected to communicate, and are not based in morality.

2.2 The effect of Managerial Behavior on Intercultural Management practice in Organization

The importance of top management taking the lead role in an organization, defines top management's behavior that is supposed to determine how the organization as a whole are perceived by stakeholders.

However, unethical, aggressive, arrogant behavior on the part of top management is immediately translated as an attributed that affect cultural management systems as whole in most organization in Nigeria.

According to Hodgetts and Luthans, (2016), cultural effect on management is reflected by basic values, attitudes, beliefs and behavior of the people that exist in organization. Culture can affect technology transfer, managerial attitudes, managerial ideology and even government-business relationships. Moreover culture affects how people think and behave in most Nigeria organizations. Hence, between top management behavior and organizational culture is that top management must

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identify personally with the defined organizational culture, as lack of identification and subsequent deviant behavior will leads to uncertainty, both internally and externally.

Richard, Carlos, and Luciara (2016) observe that traditionally, global managers have been advised to deal with cultural conflicts by adapting to the other culture. Hence, academic and management training programs have long recognized a fairly typical pattern of behavior and accommodation of managers assigned overseas for instance. That is, managers assigned overseas initially experience stress and anxiety as a result of being immersed in an unfamiliar environment (This is referred to as culture shock). However, with time, they learn new ways of coping and eventually feel more comfortable living in the culture of the host country. They are able to be effective in dealing with people from another country by learning the foreign culture in depth and behaving in ways that are appropriate to that culture (Richard, Carlos, and Luciara 2016. Following the above views, we therefore hypothesized that, H_1: *Management Behaviour has significant effect on intercultural practices in Nigerian organizations.*

2.3 Impact of Intercultural Practices on Organizational performance.

Denison and Mishra (1995) note that an important factor influencing the challenges, understanding and interpretation of the appraisal process, its development, implementation, and other appraisal related elements and functions in Organizations, is related to important organizational outcomes such as performance. According to Brooks (2016), an intimate knowledge of interculture should improve managerial ability to analyze organizational behavior in order to manage and lead people in organizations. Brooks (2016) state that intercultural management practices enables managerial ability to analyze organizational behavior which translates into superior corporate performance. McShane and Glinow (2015) observe that intercultural cultural management practice help employees to understand organizational event, and employees can communicate more efficiently and effectively thereby, reaching higher level of cooperation with each other because they share common mental models of realities.

Aluko, (2013) point out that intercultural management practices influences organizational performance. To this end, Jones (2010), cited in Aluko, (2013), suggest that the reliability of interculture

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and organizational performance encourages the identification of relevant determinants of organizational performance. In compliance with this thought, some indicators were used to examine the impact of intercultural practices on organizational performance.

Zakaria (2011) cited in Aluko (2013), contend that one of the relevant determinants of organizational performance is employee behaviour. He further observed that some of the intercultural factors that determine employee's behaviour such as the family background, beliefs and religion, values, attitudes and perception of work, commitment to work; norms and collectivism versus individualism have positive impact on workers. According to Aluko (2013), when workers exhibit positive work values and attitudes in organization, this will reduce the incidences of lateness to work and absenteeism, labour turnover are very low, the level of commitment to work is relatively high while the premium and emphasis placed on the achievement of power, wealth and prestige made the workers to put more effort at work

Ojo (2018) emphasizes the impact strong powerful culture has on organizational performance. He posited that strong culture have been hailed as key to improved performance. However, strong culture has almost always been the driving force behind continued success in business. Accordingly, strong culture firms are said to generate an almost tangible social force field of energy that empowers employees and drives the organization towards superior performance. Saffold (2012) cited in Ojo (2018), have connected strong shared values with commitment to self-confidence, ethical behavior and reduced job stress. On the other hand, Barney (2014) argue that for firm's culture to provide sustained competitive advantages and thus by implication, be source of sustained superior financial performance, certain conditions must be fulfilled; the culture must be valuable, it must enable a firm to do things and behave in ways that lead to high sales, low costs high margins, or in other ways add financial value to firms. However, Barney (2014) posits further that superior financial performance is an economic concept; hence for culture to generate such performance, it must have positive economic consequence. As such, Barney (2014) suggests that culture must be rare; it must have attributes and characteristics that are not common to the cultures of multiple firms. Therefore, such culture must be imperfectly imitable; and firms without these

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cultures cannot engage in activities that will change their culture to include the required characteristics and if they try to imitate these cultures they will be at some disadvantages e.g. reputational, experience e.t.c. compared to the firm they are trying to imitate (Barney 2014).

In line with the discussion above, we therefore, formulate the hypothesis that *H_2: Intercultural practices has significant impact on organizational performance.*

2.3 Effect of Globalization on Intercultural Management.

It is also imperative for a manager that wants global presence to place strong emphases on the external environment. It is a recognized fact that culture differs widely within the same country, not only in countries that are large and diverse but also within geographically small and relatively homogeneous countries. Hardly therefore can firms ignore the global environment, even if the firm has no plan to operate abroad. Increasingly, firms are now known to employ people from different nations with different cultural background within and outside its global environs.

2.4 Perceptions on Intercultural Management Practices around Africa

The culture of a society describes the pattern of behavior which relates to the values and beliefs that are developed over a period of time. The cultural impact of management on organizations is reflected in the basic beliefs and behavior of managers. The most common aspect is how people think and behave (Iguisi, 2004) For example in s South Africa which is made up of a population of well over 42 million people, comprising of about 75% Blacks, 12% Whites, 9% colored and 3% Indians, is already known as is a culturally diverse nation. This diversity goes on, as population grows and long exposure to western education and management practices persist, it has influenced different styles of management in South Africa (Richmond and Gestrin, 2013).

However, Ewanlen, Ogendengbe & Rebman (2017) observe that Ghana, comprises of about 100 linguistic and cultural groups whose major ethnic groups are Akan, Ewe, Mole-Dagbane, Guan and Ga-Adangbe. These ethnic groups share a common cultural heritage, history, language and origin. The major languages are Twi, Fanth, Ga, Hausa, Dagbane, Ewe, and Nzema with English Language as the official language. The management style prevalent in a culturally diverse society

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like Ghana can be appraised in line with the common characteristics of Africa society and Hofstede's (2015) classification of societal cultures. Moreover, Ewanlen, et al (2017) note that organizational power in Ghana is based on clear system of hierarchy as autocratic leadership style is common place as a result of organization hierarchy and respect for age in Africa. Hence, authority is rarely questioned and decision making is highly centralized as absolute objectives rests with God. Managers are paternalistic in nature as they show adequate concern for the welfare of the subordinates and harmony is thus maintained.

METHODOLOGY

This study employs quantitative approach, through administration of structured questionnaires. A stratified random sampling technique was used to select the fifty (50) respondents consists of management staff from various organizations drawn from different tribes in the six (6) geo-political zone in Nigeria. The questionnaire prepared in likert scale form comprises of a total of 4 questions, 2 from each sections relating to the objective of the study.

The statistical instrument employed for testing the hypotheses formulated is the Analysis of Variance (ANOVA). The decision rule is that we accept the hypothesis if the f-statistic value calculated is greater than the critical value (from the ANOVA distribution table) is greater than the critical value which is 1.53 at 5% significant level and a degree of freedom of 49, otherwise we reject the hypothesis

3.1 Interpretation and Test of hypothesis

Table 1 Effect of managerial behavior on intercultural management practice in Nigeria organizations.

	RESPONSES					
QUESTIONS	**SA (%)**	**A (%)**	**N (%)**	**D (%)**	**SD (%)**	**TOTAL (%)**

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Unethical, aggressive, or arrogant behavior on the part of top management is translated as an attributed to the whole organization.	28 (56)	16 (32)	2 (4)	2 (4)	2 (4)	50 (100)
Management must identify personally with the de-fined organizational culture	25 (50)	20 (40)	3 (6)	2 (4)	- (-)	50 (100)

Source: Field Survey 2019

Table 1 highlight respondents perception on the effect of managerial behavior on intercultural management practice in Nigeria organizations, it was observe that a total of 44 respondents representing 88% agree that Unethical, aggressive, or arrogant behavior on the part of top management is translated as an attributed to the whole organization, with only 2 respondents representing 4% were neutral, the remaining 4 respondents representing 8% disagree. Also, a total 45 respondents representing 90% agree that management must identify personally with the defined organizational culture, 3 respondents representing 6% were neutral to this opinion while 2 respondents representing 4% disagree.

Test of hypotheses

Test of hypothesis one

(a) Hypotheses formulation

H1: Managerial Behaviour has significant effect on intercultural management

(b) Test statistics is 38.4571 (see appendix II for ANOVA Result)

(c) Since the F-value is 38.471 and the critical value is 1.53, following our decision rule, we therefore accept the hypothesis meaning that Managerial Behaviour has significant effect on intercultural management

3.2 Interpretation and Test of hypothesis

Table 2 Impact of Intercultural Practices on Organizational Performance in Nigeria

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QUESTIONS	RESPONSES					
Employees behavior determines organizational performance	25 (50)	15 (30)	4 (8)	3 (6)	3 (6)	50 (100)
Family background, beliefs and religion, values, attitudes and perception of work, commitment to work; norms have positive influence on workers.	32 (64)	9 (18)	3 (6)	3 (6)	3 (6)	50 (100)

Source: Field Survey, 2019

Table 2 examines respondents perception on the question about the Impact of culture on organizational performance, a total of 40 respondents representing 80% agree to this statement that employee's behavior determines organizational performance. While 4 respondents were neutral, 6 respondents representing 12% disagree.

Finally, a total of41 respondents representing 82% agree that Family background, beliefs and religion, values, attitudes and perception of work, commitment to work; norms have positive influence on workers; 3 respondents were neutral to this assertion while the remaining 6 respondents representing 12% disagree.

Test of hypothesis two

(a) Hypotheses formulation

H1: Intercultural management practices have significant impact on organizational performance.

(b) Test statistics is 21.6429 (see appendix II for ANOVA Result)

(c) The F-value is 21.6429 and the critical value is 1.53, following our decision rule, we therefore accept the hypothesis indicating that Culture has positive impact on organizational performance.

CONCLUSION

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In response to all the 4 questions raised, respondents who were of the agreed and strongly agreed views have the highest scores with the highest percentage also recorded. Therefore, the finding indicated that managerial behaviors have effect on intercultural management in Nigeria organizations and also culture has impact on organizational performance**.**

This study has however attempted to explore intercultural management and its impact for Nigeria organization. Due to difference in attitude, behavior styles of decision making, cultural diversity and languages across Nigeria, we therefore, conclude that Nigeria organization will profit and succeed even more if the management of organization gives recognition, priority and attention to intercultural management practice.

RECOMMENDATIONS

Based on the above conclusion, we therefore recommended that management of various organizations should establish structures in their organization that will encourage good ethical behavior of all levels of managers and even employees as this has significant impact on the organizational performance.

Moreso, Management of Nigerian organization must identify personally with the defined organizational intercultural practices

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[i] PVC stands for Permanent Voters Card
[ii] SCR is abbreviation for Smart Card Reader
[iii] NCSL in full is National Conference of State Legislatures

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