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PUBLIC SECTOR DIGITIZATION AND ITS CAUSAL IMPACT ON CORRUPTION REDUCTION

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Abstract

This research analysis pursuit and seeks to determine public sector digitization and its causal impact on corruption reduction. In particular, to measures to enhance public processes more transparent, efficient, and less prone to corruption *including through the use of digital. To determine how effective is The ICT use through e-government portals /webs and their contributions to* corruption reduction *in public sector and* to determine if corruption reduction *activities are effective on features such as bribery by making more information available to the* public. *The data spanning from 1981 to 2023 report of Statistics Bulletin Public Finance. Which include the listed sectors Federal Ministry of Finance, Office of the Accountant-General of the Federation and Central Bank of Nigeria. Made up the set of observation Federal Government Capital Expenditure (₦' Billion) which include component like; Normal GDP; Administration, Economic Services, Social Communications Services and Transfers On the other hand Eviews 10 were used to analyze the data. The data spanning from 1981 to 2023 report of Statistics Bulletin Public Finance. Which include the listed sectors Federal Ministry of Finance, Office of the Accountant-General of the Federation and Central Bank of Nigeria. Made up the set of observation Federal Government Capital Expenditure (₦' Billion) which include component like; Normal GDP; Administration, Economic Services, Social Communications Services and Transfers. e-SQ means electronic service quality (Public sector digitization) The inference of this were that (a slope of 4927.428 (42.8%) growth coefficient per annual of 5% likelihood increase in each measure of the multiple linear component of performance (HDI) e-qualities Public sector digitization degree of relationship among features component on corruption reduction by (public security sectors) of who had explanations with expenditures might cause an increase in growth of the respective measure this implied (a>1 is satisfied) . using the multiple OLS as evidence. Suffices to say that, this general findings of NORMAL GDP has effect on public sector digitization degree of relationship among features component. Also, Durbin-Watson stat of 0.815169 shows that there is no evidence of the element of positive autocorrelation meaning that there is no linear relationship between public sector digitization. The normality histogram reveals the set of data positively that is skewed to the frequency curve right and jarque-Bera value of 14.59571 and associated probability value of 0.000680 which signifies normal distribution (Normality) of the multiple regression models for the H_1: There is evidence of significant difference of public sector digitization and its causal impact on corruption reduction Residuals are not normally distributed over time. In short, the listed recommendations emerge; this research will improve effectiveness policy in public sectors quality of E-management (MIS) and (ICTs) by influencing their economic fraud decay. Nigerian's people and rest of the world should ignore political instability, economic mismanagement, corruption or frauds and other negative factors on their nation economy. Which will be an impact on corruption reduction public sector digitization E-services and more.*

Keywords: *Public Sector; Normal GDP (HDI); Digitization; Corruption Reduction.*

Introduction

It is necessary for an organization to establish an effective fraud prevention and detection mechanism because it can reduce the opportunities of fraud from occurring (Bierstaker, Brody & Pacini, 2006). Digitalization in the public sector is needed to align with international standards and reduce corruption (Afonasova et al., 2019). Determinations to establish clear rules and render public processes more transparent, efficient, and less prone to corruption including through the use of digital. The ICT use through e-government can contribute to corruption reduction activities such as bribery by making more information available to the public. In other words, Digital transformation enhances efficiency and record keeping and accountability in Nigeria's public sector, aiding the fight against corruption reduction among sectors. (Ramonu, 2026).

These methods can comprise managerial communications about intolerance to fraudulent activities, executing transparent performance and remuneration schemes, preemployment and on-going screening and, most significantly encouraging a culture of fraud awareness (PwC, 2012). A survey conducted by PwC (2014) revealed that 37% of respondents globally reported fraud did occur in their organizations, and the number of economic crimes seemed to pose a persistent threat to businesses and their business processes. Ernst & Young (2014) reported the 59 countries involved in the investigation agreed that incidence of fraud and reported cases are not declining. In fact, new ways of fraud constantly emerge and matters that regulators and public consider inappropriate or fraudulent are evolving.

A survey by KPMG Malaysia (2013) discovered that the highest number of fraud perpetrators came from employees which represented about 50%. These employees were found to be among those in non-management. In 2009, this category of fraud perpetrators i.e. employees, in contrast, only represented about 34%. These figures are alarming to the government and the management, as there was an increase of 16% in 2013. The second category of fraud perpetrators were customers, followed by management, each category represented about 18% respectively. Other fraud perpetrators identified were service providers (8%) and suppliers (6%). The report also highlighted that theft of outgoing funds was the highest reported category of fraud at 67% in 2013 compared to 57% in 2009 investigation.

Ranking second was theft of physical assets at 58%, followed by theft of incoming funds at 34%. On an individual basis, the most common types of fraud were theft of cash and cash receipts (26%), followed by false invoicing (16%) and theft of inventory (13%) (KPMG Malaysia, 2013). Governments and corporations as claimed by Ernst & Young (2014) agree that fraud, bribery and corruption are bad for business and society, and that decisive steps need to be taken to reduce them.

In order for the Government to succeed in reducing corruption fraudulent behaviours, internal controls serve are critical tools to be utilized in conjunction with operation and financial reporting and compliance objectives. Internal control is broadly defined as procedure, process or policy that is enforced in order to enhance efficiency, safeguard assets from being misappropriated or stolen and to prevent fraud and error (Princeton, 2010). Report from (2025). opines that Internal control is "the whole system of Controls, financial and otherwise, established by the management in order to carry on the business of the enterprise in an orderly and efficient manner, ensure adherence to management policies, safeguard the assets and secure as far as possible the completeness and accuracy of the records".

Corruption reduction and its prevention calls for measures to stop fraud from occurring in the first place. Fraud detection comes next once fraud prevention has failed as it involves identifying fraud as quickly as possible once it has been perpetrated (Bolton and Hand, 2012). By nature, fraud detection must be used and worked continuously as fraud evolves. Clearly, the traditional approach to detect and prevent fraud, like auditing, is not sufficiently effective and only enabled fraud to be detected months after the date of the transactions, if ever.

In some cases, the consequent huge losses cause the organization to lose sustainability and the business would consequently collapse. Such belated discovery of fraud would then only have recourse on punishment which demonstrates a reactive approach instead of a proactive approach. Hence, deriving an understanding on the causes of fraud becomes vital, since this will crucially lead to identification of the most effective mechanisms to detect and prevent the occurrence of fraud.

Internal Control: Millichamp (1996) opines that fraud is "intentional misstatements, in, or omissions of amounts or disclosures from, an entity's accounting records or financial statements". He went further to buttress the point that fraud is an illegal act that is any act, which is contrary to the law.

The researcher agrees with the explanation made by the above authors on internal control. However, the researcher is of the view that internal control when transacted into public sector environment is a "Process designed by our government financial administrators in order to carry on the financial activities of government in an orderly and efficient manner, ensure compliance to government policies, protect the assets and secure as far as possible the completeness and accuracy of the government financial statements". In other words, Internal Control may be a government system installed, to effectively and efficiently prevent, detect and control material accounting errors or frauds on a timely basis.

Periyanayagam (2004) emphasized strong internal control as the most effective method of fraud prevention. Moyes and Baker (2003) conducted a survey of practicing auditors on the importance of fraud detection effectiveness and their results indicated 56 out of 218 procedures were considered more effective in detecting fraud. Generally, the most effective procedures were associated with the existence and/or the strength of internal controls in the organizations. Omar and Bakar (2012) conducted a survey on Fraud Prevention Mechanisms of Malaysian Government-Linked Companies: An Assessment of Existence and Effectiveness and their results showed that management review of internal controls and external audits of financial statements ranked as the top-most fraud prevention mechanisms in terms of the percentage of existence in organizations as perceived by internal auditors and fraud investigators, followed by operational audits, internal audits or fraud examination departments, and internal control review and improvements by departments. Omar and Bakar (2012) asserted that companies ignored the existence of red flags, and actions were only instituted after the discovery of fraud. They identified the top-most fraud prevention mechanisms in Malaysian Government-Link Companies (GLCs) are management review of internal controls and external audit of financial statements.

Statement of the Problem

Digitization of Service quality in public sector and industry is relatively more challenging to measure than in other service industries i.e. E-government, financial sector, in which system and work processes consist of distinct but inter-related tasks. Public sector services are executed concurrently and their delivery involves many entities such as public sector authorities, and a host of other third parties (e.g. caterer, AI security operatives and services providers, etc.). Accordingly, a unified effort is required to coordinate the multiplicities of processes needed to deliver superior service quality in the public sector.

A review of literature about service marketing reveals that the direction of causality and relationships among public sector service digitization quality, customer satisfaction and loyalty is an important, unresolved subject matter characterized by inconsistencies and controversies. For instance, Oliver (1993) and Auh and Johnson (2017), have viewed public sector service quality of digitization and customer satisfaction as complementary or divergent constructs. Other researchers further established the causal reciprocity of service quality and customer satisfaction, which creates further confusion. Similarly, the claim that customer satisfaction leads to loyalty appears even less convincing.

Although a number of researchers have examined the relationship among perceive service quality, customer satisfaction and loyalty in the airline industry internationally, to the best of the author's knowledge no study has yet investigated these relationships in the Nigerian airline industry. Similarly, a large number of existing studies have mainly been inspired by the SERVQUAL framework to analyze customer perceptions of service quality, which has been found to be inadequate in the public sector service digitization quality context; hence, the growing debate to enhance its robustness.

Correspondingly, a review of public sector service digitization quality publicizing literature reveals that a sizeable number of previous researches on public sector service digitization quality in Nigeria paid a relatively large amount of attention to banks and the telecommunications industry. Surprisingly, in the few works concerning the Nigerian Public sector service digitization quality (Ckiwendu, Ejem, Ezenwa, 2019; Geraldine, Chikwendu, 2017; Olaniyi, Onwuka, Agu, 2023), the researchers paid scant attention to the public sector service digitization quality model. More importantly, most of these studies used firm as against governmental level analysis in their revisions.

Considering this focus and the expected faster growth rate of air transportation in developing countries (Netjasov, Janic, 2018; Japan Aviation and Development Company-JADC, 2012), it appears that the sector has been given relatively less research attention than it values and its connecting impact on corruption reduction sector

Research Objective

The main purpose of this investigation is to those features of public sector digitization and its causal impact on corruption reduction while, other objectives in specific includes;

1. To determines measures to enhance public processes more transparent, efficient, and less prone to corruption including through the use of digital.
2. To determine how effective is The ICT use through e-government portals /webs and their contributions to corruption reduction in public sector.
3. To determine if corruption reduction activities are effective on features such as bribery by making more information available to the public.
4. To know if withstand Digital transformation enhances efficiency and record keeping and accountability in Nigeria's public sector, aiding the fight against corruption reduction among sectors.
5. To recommends policy factors that will enhance reductions on public sector digitization and its causal impact on corruption in Nigeria.

Research Question

1. What are those measures needed to determines public processes more transparent, efficient, and less prone to corruption including through the use of digital?
2. What are those factors necessary to determine how effective is The ICT use through e-government portals /webs and their contributions to corruption reduction in public sector?
3. What are those extent to determine if corruption reduction activities are effective on features such as bribery by making more information available to the public?
4. How do we know if withstand Digital transformation enhances efficiency and record keeping and accountability in Nigeria's public sector, aiding the fight against corruption reduction among sectors?
5. What are those necessity findings features on policy recommends that will enhance reductions on public sector digitization and its causal impact on corruption in Nigeria?

Research Hypothesis

The hypothesis listed is measured at 0.05 significant level criteria

Ho: There is no evidence of significant difference of public sector digitization and its causal impact on corruption reduction.

Significant of the Study

The research theme on public sector digitization and its causal impact on corruption reduction. Illustrations the significance of public sector in e-business, relations among the employee and customers, prospects and the satisfactions derived from the e-service rendered either positive or negative impact on corruption reduction. Since the gaining of a public sector digitization Republican state in 1963 Nigeria, the public sector digitization, industry has not looked back on the progress of the public sector digitization, which however would bring economic stability in the country public sector.

Research Limitations

It is important to note that this research findings will not be too exhaustive research which is limited to public sector; digitization and its contributing impact on corruption reduction.

Operational Definition of Terms

Service Quality: This refers to as; SERVQUAL model determines the gap between customers' expectation and perception (Zeithaml et al, 2023). Service quality is a comparison of expectations with performance. A business with high service quality will meet customers need whilst remaining economically competitive. Improved service quality may increase economic competitiveness.

Satisfaction: This is an overall effective response to a supposed discrepancy between a prior expectation and a perceived performance after consumption. Gures et al (2014) define satisfaction as the degree that one believes that an experience evokes positive feelings. Customers level of approval when comparing a products' perceived performance with his or her expectations. Also, it could refer to as discharge, extinguishment, or retirement of an obligation to the acceptance of the obligator, or fulfillment of a claim. While satisfaction sometimes is equated with performance, it implies compensation or substitution whereas performance denotes doing what was actually undertaken.

Perceived Value: "perceived value" is an important marketing concept. It lies at the heart of marketing and deals solely with the customers' perception of a product. Perceived value is a consolidated measure because it takes into accounts subjectivity perception with limits placed on it by price and other objective prices.

Public Sector Digitization: Digital transformation to public or masses to enhances efficiency and record keeping and accountability in the world through internet connections among other modifications of E-government of public sector, aiding to achieved goals financial or common on employee performance among other needs and effort, reduction among sectors. (Ramonu, 2024).

Literature Review

Conceptual Review

The Community of Sponsoring Organizations (COSO) developed a framework that focused on five (5) components believed to be of vital importance in implementing proper internal controls (Auditors, 2008). COSO's internal control framework is recognized by the Security and Exchange Commission (SEC) and Public Company Accounting Oversight Board (PCAOB), and is generally called "layers," and the controls within each must be included in management's assessment (Auditors, 2008).

Concept of Public Sector Service Quality

The definitions of public sector service quality vary only in wording but typically involve determining whether perceived service delivery meets, exceeds or fails to meet customer expectations (Cronin &Taylor, 1992; Oliver, 1993; Zeithaml, Berry and Parasuraman, 1993). E- Service quality has also been defined by Czepiel (1990) as customer perception of how well a E-service meets or exceeds their expectations public sector service quality is commonly noted as a critical prerequisite and determinant of competitiveness for establishing and sustaining satisfying relationships with customers.

Previous studying suggests that service quality of public sector is a significant indicator of client satisfaction (Spreng & Machoy, 1996). Attention to service quality can make an organization different from other organizations and gain a lasting competitive advantage (Boshoff &Gray, 2004). In particular, consumers prefer public sector E-service quality when the value and other cost elements are held constant (Turban, 2002). It has become a distinct and important aspect of the product and service offering (Caruana, 2002). The satisfaction a customer gets from quality of service offered is usually evaluated in terms of technical quality and functional quality (Gronroos 1984). Usually, customers do not have much information about the technical aspects of a service; therefore, functional quality becomes the major factor from which to form perceptions of service quality (Donabedian, 1982).

Public sector Service quality can be measured in terms of customer perception, customer expectation, customer satisfaction, and customer attitude (Sachdev & Verma 2004). Ekinci (2003) indicates that the evaluation of E-service quality leads to customer satisfaction. Rust and Oliver (1994) define satisfaction as the "customer fulfillment response," which is an evaluation as well as an emotion-based response to a service.

Crosby (2018) defined Quality as consistency with fixed specifications and this agrees with Karim's definition (2016), who defined Quality as anything that accords with the characteristics of the product to meet the external clients' needs. In addition, the product quality differs from that of a E-service as the earlier is tangible, whereas the latter is intangible. Public sector Service is also defined differently. The American Society for Marketing, for example, defines service as activities or benefits that are offered for sale, or that are offered for being related to a particular product. Kotler (2003), defined E-service as 'any behavior or act based on a contact between two parties: the provider and the receiver, and the essence of this reciprocal process in intangible. Hakesver (2000) looked at service as a set of economic activities that provide time, location form and psychological benefits. Beer (2013) defined service as a set of characteristics and overall properties of the service which aim to satisfy the clients and meet their needs. Mohamed & Shirley (2019) emphasized that banks have to care about the quality of their services public sector since this quality is considered the essence or core of strategic opposition.

Walfried, (2000) defined service as a set of characteristics that meet the clients' needs, strengthen the links between the organization and them, and enhance the clients' value as well. Huseyin, (2005) believes that good knowledge of the characteristics and advantages of service quality on the part of banks do contribute for their success and their persistence in the international banking competitive environment. From these definitions we conclude that the quality of banking service is an integrative assessment of the services offered to the external client, for clients are considered to be independent individuals with various requirements on the basis of which services are provided, based on certain specification. This requires that banks have to carefully select creative employees with high qualifications and capabilities.

Service quality has been defined in services marketing literature as an overall assessment of service by the customers. Perceived service quality is believed to be resulting from comparison between customers' prior expectations about the service and their perceptions after actual experience of service performance (Asubonteng, 1996; Parasuraman 1985). Service quality has been defined by the practitioners in terms of key dimensions that customers use while evaluating the services (Lewis &Booms, 1983).

Conceptualization of service quality should include both the service delivery process (Parasuraman, 1985) as well as the service outcomes (Lehtinen & Lehtinen, 1991). Gronroos (1984) offered a service quality model with dimensions of technical quality (what consumer gets), functional quality (how consumer gets the service) and corporate image (how consumers perceive the firm and its services).

Similarly, Lehtinen &Lehtinen (1991) offered another model with three dimensions of service quality: physical, interactive and corporate. Physical quality is about the quality of physical products involved in service delivery and consumption. Interactive dimension refers to the interaction between the customers and the service organization employees. Corporate quality refers to the corporate image as perceived by the customers. The service quality literature has also highlighted that E-service quality can also be treated as a second order construct consisting of interaction, physical environment and outcome quality (Brady and Cronin, 2001) Public sector.

Public Sector and Client Satisfaction

There is shortage of consensus among researchers on the subject matter of customer satisfaction. This is because several researchers have looked the concept from different perspectives. Rust and Oliver (1994) suggest that customer satisfaction or dissatisfaction - a “cognitive or affective reaction” - emerges as a response to a single or prolonged set of service encounters. In the words of Giese and Cote (2000), consumer satisfaction comprises three basic components including the type of response (cognitive, affective or co native); the centre of interest or the subject on which the response is focused; and the moment in time at which the evaluation is made. But Anderson and Fornell (1994) are of the view that the literature is not very clear about the distinction between quality and satisfaction. Satisfaction is a “post consumption” experience which compares perceived quality with expected public sector quality, whereas public sector quality refers to a global evaluation of a public sector service delivery system (Anderson & Fornell, 1994; Parasuraman 1985).

According to Besterfield (1994), Barsky (1995) and Kanji and Moura (2002), customer satisfaction is a complex construct as it has been approached differently. As expressed by Levesque and McDougall (1996), satisfaction is conceptualized as an overall, customer attitude towards a service provider. Also, customer satisfaction has been described as an effective response, focused on product performance compared to some pre purchase standard during or after consumption (Halstead et al., 1994). So, Mano and Oliver (1993) establish that satisfaction is an attitude or evaluative judgment varying along the hedonic continuum focused on the product, which is evaluated after consumption. This was reechoed by Fornell (1992), when he identified satisfaction as an overall evaluation based on the total purchase and consumption experience focused on the perceived service performance compared with pre purchase expectations over time.

Satisfaction as a state felt by a person who has experienced performance or an outcome that fulfill his or her expectation. It is a function of relative level of expectations and perceived performance (Kotler & Clarke, 1987). In another way, satisfaction is a positive, affective state resulting from the appraisal of all aspects of a party’s working relationship with another (Boeselie & Wiele, 2002). While customer satisfaction is an individual’s feeling of pleasure or disappointment resulting from comparing a product’s perceived performance (or outcome) in relation to his or her expectations (Brady & Robertson, 2001).

Gratification became a popular topic in marketing during the 1980s and is a debated topic during both business expansions and recessions. Most discussions on customer satisfaction involve customer expectation of the service delivery, actual delivery of the customer experience, and expectations that are either exceeded or unmet. If expectations are exceeded, positive disconfirmation results, while a negative disconfirmation results when customer experience is poorer than expected. In today's world of intense competition, the key to sustainable competitive advantage lies in delivering high quality service that will in turn result in satisfied customers (Shemwell, 1998).

Kolter and Armstrong (1999) defended the customer satisfaction as the customer's perception that compare their pre-purchase expectations with post purchase perception. Oliver (1997) defines satisfaction as “the consumer’s fulfilment response”, a post consumption judgment by the consumer that a service provides a pleasing level of consumption-related fulfilment, including under or over-fulfilment. Oliver (1981) point of view Customer satisfaction is the evaluation a customer makes to a certain exchange, which reflects the relation of the customer's expectation and their real perception to products and services they receive.

Some researchers think customer satisfaction can be measured. For example: Caepiel (1974) suggested using overall measurement to record customers' response to different attributes of products and services. Kuo (1996) recognized seven factors that influence customer satisfaction: service content, price, convenience, corporate image, equipment, staff and procedure. Huang (1998) also defined five factors used to evaluate customer satisfaction: product, service, staff, overall performance of products, and closeness to expectancy.

Public sector satisfaction is a well-known and established concept in several areas like marketing, economic psychology, welfare-economics, and economics (Muzahid and Noorjahan, 2009). Customer satisfaction is not the final destination of any service. It has a positive correlation between customer satisfaction and loyalty (Anderson and Sullivan, 1993).

Relation Between Service Quality and Customer Satisfaction

This section reviewed extant literature on the determinants of domestic airline patronage in Nigeria, the moderating variables of the study and how they influence domestic airline patronage in Nigeria. The dimensions or components of airline patronage used in this study include the following: Perceived Service Quality, Perceived Airfare Fairness, and Perceived Operational Effectiveness while the moderating factors include Passenger Attitudinal Disposition towards Airline Image and Passenger Socio-Economic Wellbeing. Service quality is generally viewed as a multidimensional concept because customers evaluate a variety of dimensions on a company’s products or services. Service quality is the result of the comparison that customers make between their expectations about a service and their perceptions of the actual service performance (Zeithmal, 1988; Gronroos, 1988; Parasuraman, Zeithaml and Berry 1985, 1988; Mersha, 1992).

The consumers, on the other hand, define customer satisfaction, as an emotional feeling after experiencing a certain service, which in turn leads to an individual overall attitude towards purchasing of service (Oliver, 1981). It is a person’s feelings of pleasure or disappointment resulting from comparing a product is perceived performance or outcome with their expectations (Kotler & Keller, 2009). Satisfaction is the consumer’s fulfillment response. It is a judgment that a product or service feature, or the product of service itself, provided (or is providing) a pleasurable level of consumption-related fulfillment, including levels of under- or over-fulfillment (Oliver, 1997).

Cronin and Taylor (1992) found empirical support for the idea that perceived public sector E-service quality led to satisfaction and argued that service quality is actually an antecedent of consumer satisfaction (Cronin, Brady, & Hult, 2000; Anderson, Fornell & Lehman, 1994). Customer satisfaction is often seen as a multidimensional construct along the same dimensions that constitute service quality (Sureshchandar, Rajendran & Anantharaman, 2002). Despites strong relationships between public sector E-service quality and customer satisfaction, the two constructs are in fact different from the customer’s point of view (Baker, 2013). Brady and Cronin (2001) try to clarify the specification and nature of the service quality and pleasure constructs and found empirical support for the conceptualization that service quality was an antecedent of the super ordinate satisfaction construct. In the aviation industry, Huang (2009) states that service quality affects customer satisfaction, and that customer satisfaction affects customer behavior, including repurchase intention and word of mouth. Similarly, Yunus, Jamil and Rashid (2013) argue that the quality of service delivery by airlines has a significant effect on customer satisfaction, which in turn, significantly affect customer loyalty.

These findings corroborate Retnaningsih (2013) submission. Additionally, Chou, Liu, Hung, Yih, and Han (2011) evaluate airline service quality in a Taiwanese airline and found that reliability and assurance are the first important dimensions, responsiveness is the second, empathy the third followed by tangibles and flight pattern. Other magnitudes of airline services include safety, customer complaint handling, courtesy of crew, on-time departure and arrival, comfort and cleanliness of seats, flexibility, friendliness and honesty (Hynes & Dredge, 1998). In addition, Wang, Shu, Lin and Tseng (2011) inspect nine evaluation criteria of service quality in the airline companies and found that passengers are more concern with comfort, internal decoration and the services of public sector.

The five components introduced by COSO, included the control environment, risk assessment, control activities, information and communication, and monitoring. Management thus uses these components to design specific controls that address these components (Auditors, 2008). Therefore, developing internal controls entails proper authorizations, segregation of duties, processes, accountability of assets, and documentation procedures. It also includes physical, mechanical and electronic controls and independent internal verification, which should therefore make the internal control effective (Auditors, 2008).

Whistle-blower mechanisms: Management and employee fraud are concerns for all organizations today. Confidential reporting mechanisms, or whistle-blower hotlines, are often proposed as one tool in the organization s internal control arsenal for dealing with fraud. The guiding framework for the design and evaluation of internal control today is the 1992 report issued by the Committee of Sponsoring Organizations, commonly called the COSO Report. A key dimension of internal control in the COSO Report is communication. Since fraud involves concealment and communication fosters openness, it is logical that communication might act to thwart fraudulent activities. Indeed, COSO asserts that a key element of good communication is upstream communication, such as that provided via a whistle-blower hotline (Hooks, 1994).

If communication regarding observed incidents of fraud is to occur, it is vitally important to the organization that these reports are made internally, rather than through external paths. It is only in this way that organizations can meet the challenge of addressing the immediate problem of fraud and correcting the internal controls which allowed the fraud to occur. This will also give the entity the ability to report the wrong-doing and associated corrective action to appropriate authorities internally and externally, if necessary, rather than suffering the embarrassment and potential legal penalties resulting from learning of the fraud through external channels. It is encouraging to note that nearly all whistle-blowers first report perceived wrongdoing to parties within their organizations (Miceli and Near, 2002). When valid, such reports provide the opportunity for wrongdoing to be corrected and organizational controls to be improved.

The American Heritage Dictionary defines a whistleblower as one who reveals wrongdoing within an organization to the public or to those in positions of authority. Whistleblower hotlines have been common place in government agencies and for governmental contractors for decades. More recently, whistleblower mechanisms are considered a possible tool for the detection, and possibly prevention, of corporate wrong-doing.

Miceli and Near (1992) describe whistle blowing as the disclosure by organization members (former or current) of the illegal, immoral or illegitimate practices under the control of their employers, to persons or organizations that may be able to effect action. Wilmot (2000) defines whistle blowing as the public exposure of organizational wrongdoing. Dawson (2000) gives a more detailed definition by defining whistle blowing as a deliberate voluntary disclosure of individual and organisational malpractice by a person who has had privileged access to data, events or information about an actual, suspected or anticipated wrongdoing within an organization that is within its ability to control. This is consistent with the definition of Ahern and McDonald (2002) that define whistle blowing as any reporting of misconduct in the workplace.

Greene and Latting (2004) note three criteria appear to be consistent in the definitions of whistle blowing:

1. The act of notifying powerful others of wrongful practices in an organization
2. Motivated by the desire to prevent unnecessary harms to others and
3. The action of an employee or former employee who has privileged access to information

According to Chung (2004) and Ahmad (2011), whistle blowing can be internal or external. Internal whistle blowing is the reporting of wrongdoings to sources within the organization that can bring change. External whistle blowing happens when the complaint recipient is outside the organisation. Most whistleblowers are internal whistleblowers, who report misconduct on a fellow employee or superior within their company. Kaplan and Schultz (2007) argue that internal whistle blowing is generally preferred to external whistle blowing. Managers prefer that whistleblowers use internal channels rather than external channels so that the firm's dirty linen is not aired in public.

Callahan et al. (2002) argue that where internal whistle blowing is more ethical than external whistle blowing. External whistle blowing is not only disloyal to the firm but can also trigger destructive side effects. Zhang et al. (2009) note that disclosing information inside to a company to external parties breaches obligations to the organisation, violates the written or unspoken contract. Ahmad et al. (2011) point out that by rectifying corporate problems internally, management can ensure that confidential information stays confidential and encourages organisational accountability and learning. David (2005) notes that when internal reporting occurs, companies have the option to deal with the situation on their own terms and in their own time. Internal disclosures can also make the company aware of potentially damaging conditions before they become a crisis.

Finally, internal whistle blowing handled in an ethical and compassionate way by managers signals other employees that it is safe for them, too, to become the eyes and ears of the company. Whistleblowers are appreciated by some organisations. Macey (2007) points out those whistleblowers are now thought as an integral part of corporate governance that is supposed to result in better monitoring and control of management misconduct. Tip-offs from inside by whistleblowers are now regarded as the most common method of fraud detection.

Bowen pointed out (2010) and Ahmad et al. (2011) point out that whistle blowing will allow the organization to rectify public wrongdoing internally and prevent them from encountering any further damage. In some countries, whistle blowing is seen as cultural or organisational dissent and whistleblowers are often punished. According to Chiu (2003), ethics are cultural specific. Although Western research into whistle blowing shows that the average whistleblower can be regarded as a model employee, this situation is not unequivocal. Whistle blowing is considered as unacceptable and unethical behavior by many model Chinese employees. This is because it breaks down the ties between employer and employees especially as loyalty is considered an important element in the employment relationship.

Greene and Latting (2004) point out that over 90% of whistleblowers are made to end their careers early, or were blacklisted, treated as insane, lost their life savings through lawsuits, their marriage or even lives. Nayir and Herzig (2012) explain out that whistle blowing is perceived as a negative act in Turkey. Complaining openly about ethical misconduct such as bribery is not common. Whistle blowing is referred to an act of disloyalty that may damage the image of companies. Studies such as Mesmer-Magnus and Viswesvaran (2005) and Miceli et al. (2009) have shown that whistleblowers often suffered serious reprisals from their employees in response to their actions. According to Zhang et al. (2009), some people consider whistleblowing as "tattling" or" ratting" and would never approve of it.

Theoretical Frameworks

The Corruption and Fraud Scale Theory

Numerous studies were conducted on fraud in the public sector management. One such study examined fraud as it relates to the history, issues, tools and challenges (Brock, 2012). According to Brock (2012), the most extensive economic crimes worldwide are misappropriation, accounting fraud, influence peddling and corruption and cybercrime. Brock (2012) also described a typical fraudster as a male between 36 and 55 years of age and hold from intermediate positions to senior officers' rank. Brock (2012) also quantified that the typical fraudster act in collusion with others, working for more than ten (10) years at the organizations, and is mostly found in the accounting or finance department.

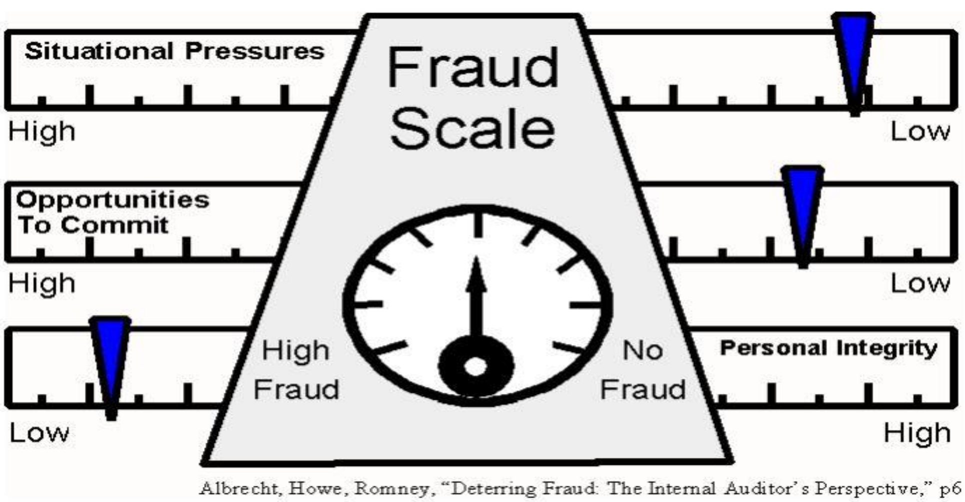

Figure 1: The Corruption and Fraud Scale Perspective Diagram
Sources: Author's Computation (2026)

In addition, the key factors leading to fraud are personal financial needs, opportunity and greed (Brock, 2012). Although eradicating fraud is impossible, it is possible to reduce the risk that occurs (Brock, 2012). Some key deterrence for fraud as noted by Brock (2012) were assessing the risk to delimit high risk areas (with the awareness that fraud occurs most frequently in the finance department), conduct audits prior to hiring, especially for key positions (including police record, credit bureau), review employment contracts (whistleblowing, code of conduct) and set up a whistleblowing program and reporting mechanism (telephone line, mailbox or any other anonymous was of exposing an irregularity).

Similarly, a study by Heerden (2011) in Switzerland revealed that weak internal control was the major factor that contributed to the on-going fraud. In addition, Heerden (2011) reported that misappropriation of assets is the most common fraud, and has been exposed by whistleblowing mechanisms. On the other hand, one in seven frauds has been discovered by chance. This puts a question mark on the effectiveness of controls and management review utilized in detecting and preventing fraud (Heerden, 2011). Heerden (2011) suggested that management review and basic internal control mechanism was rated as the most effective means for detection. In a third research completed by Sidorsky (2006), it was emphasized that red flags can provide warning signs of fraud; however, it cannot indicate guilt or innocence. Nevertheless, being able to recognized red flags is necessary not only for private accountants, but also for audits in the public sector where the potential for fraud to occur exists (Sidorsky, 2006).

Ajzen's theory of planned behaviour (1991) argues that the intentions of individuals will determine the actual behaviour towards something. Attitude is evaluative in that it leads to a judgment on the object and behavioural intention is the immediate predictor of the actual behaviour. The underlying assumptions of the theory are that: much human behaviour is planned and therefore preceded by intention towards that behaviour. Human beings are rational and make systematic use of information available to them when making decisions (Arjen, 1991). Park & Blenkinsopp (2008) & Zhang et al. (2009) note that in the whistleblowing concept, whistleblowing intention is an individual's probability of choosing whistleblowing under certain circumstances. Therefore, an individual's whistleblowing intention can be strongly predictive of his or her final behaviour.

In view of the gravity of the fraud in our system, various organizations have employed different measures blowing, red flags with internal control as the most frequently suggested measure yet fraud has continued in upward trend. This has called the effectiveness of these measures into question.

Exponential Functions Growth and Decay Theory

According to Ramonu, (2024) who established the mathematical modeling of growth and decay applied mathematical practice in line with Geoffrey and Andrew (2016). Defined fraud as unexpectedly large influence on services sectors and industrial sectors of any economy respectively.

We have;

$$\frac{F}{D}\ I.e\,\frac{Fraud}{Debt} = CGQ\ Should < 1$$

Since We have; $\frac{DEBT}{EQUITY} = \frac{D}{E}$ =EQUITE + DEBT + FRAUD ≠ CAPITAL (ASSEST)

Actually, during critical investigation, criticism of Ramonu (2024). Stated that if fraud a<1 it implied there is impact of good corporate governance quality in the performance of operation in the companies listed otherwise poor corporate governance quality is experience.

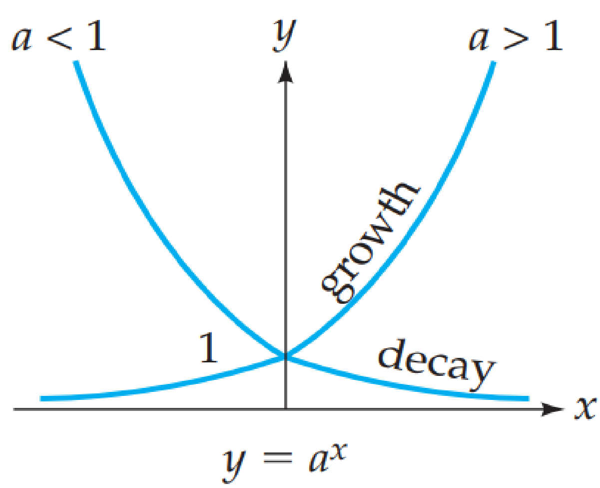

Figure 2
Sources: Ramonu (2026)

Exponential functions have exponents that involve variables. The exponential functions f(x) =a^x slope upward or downward depending upon whether the base a (which must be positive) satisfies a < 1 or a >1. By considering a 100% increase not given all at once but divided up into smaller and smaller successive increases, we defined a new constant e:

$$e^x = 1 \lim_{n \to \infty} (+ \frac{n}{1!}) \approx 2.71828 - \infty < x < \infty$$

Exponential functions with base e are used extensively in modeling many types of growth, such as the growth of populations and interest that is compounded continuously. For interest compounded continuously, the formula is Pe^{rt}. Therefore, we justified the above modeling criticism against trade-off theory since practically good corporate governance quality is equal to fraud divided by firm equity.

Empirical Reviews

Empirical reviews that is relevant to the issue we examine in the study relates to determinant of perceived values, service quality and customers satisfaction in the Nigerian aviation industry. The researchers have used hierarchical regression analyses to investigate the determinants of perceived values and service quality on customer's pleasure and loyalty. The study also highlights the significance of customers' perception of atmosphere on the success of the aviation industry. The study points out that the service quality and perceived values have positive and significant effect on customers' satisfaction and loyalty. The revision suggests that attitudinal displays and corporate image of the sectors are of immense importance for corporate ethnics.

Furthermore, the revision found that functional E-service of the airline together with effectiveness in the service quality standards increases the satisfaction and loyalty of customers. The study makes important contribution towards understanding the formation of satisfaction and loyalty. From a practical perspective, the quality of physical environment is a critical tool for overall aviation industry success.

Cronin and Taylor (1992) developed the SERVPEF model to evaluate customers overall feeling towards service delivery. An empirical study by Cronin and Taylor perceived values and customer satisfaction made use of descriptive, factor analysis, regression and correlation statistical techniques were employed to investigate the relationship between service qualities (SQ) dimensions, patients satisfaction (SAT) and behavioral intention (BI). The findings show that SERVPERF scale was more efficient than SERVQUAL scale in explaining the variance in service quality.

The empirical carried out by Saglik kurumlarinda and Algilanan Deger (2013) on perceived values and customers satisfaction in aviation, exploratory factor analyses, correlation, regression analyses were used to analyze data set. The results obtained reveal that responsiveness are one of the key dimensions of SERVQUAL, which have a meaningful and strong relationship with both perceived service quality and customers satisfaction.

A study by Mahmoud, Ahmad (2012) aimed to measure the impact of service quality on customers' satisfaction in an industry sector in Jordan. The study showed that there were statistically significant differences in the determinant of perceived values and customers satisfaction in private sector aviation as against public sector aviation. A study by Liz Gill and Lesly White (2020) on critical review of customer satisfaction, in the finding pointed out that customer's satisfaction has been extensively studied and considerable effort has gone into developing survey instruments to measure it.

Patawayati, Djumilah Zain, Margono Setiawan and Mintarti Rahayu (2013) conduct an empirical research on customers' satisfaction, trust and commitment. Mediator of service quality and impact on loyalty, it showed that it has no significant effect on customers' loyalty. The results indicate that service quality has positive and significant effects on customers' satisfaction, and patients trust and commitment significantly affects customers' loyalty.

Ahasanul, Abdullah, Farza (2012) conduct an empirical research on influence of customer perceived service quality on customer satisfaction using correlation models to identify the inter-relationship between customers perception and customers satisfaction. He recommended that essential service quality variables that are associated with the customer satisfaction in aviation industry.

A revision by Nasim, Parisa, Farshid, Mohammed (2013) an empirical investigation to measure different dimension of aviation service quality (ASQ) by gap analysis and customers satisfaction (CS). The revision analyzes relationship between ASQ and CS in the context of Nigerian aviation industry services, using structural equation modeling (SEM) from customers' perspective. It showed that there was a positive and significant impact from service quality on customers' satisfaction.

A study by Noor Azlinna, Bahari Mohammed (2013) the hypothesized effects among the constructs were tested empirically on effects of perceived values on customer satisfaction at the airport. Using a PLE-SEM tool, no statistically significant relationships were found between perceive service quality construct and aviation construct. It can be concluded that, the model is suitable in determining the public quality E-service.

The aim of this research was to develop an amount of measurement tools about quality. They focused on the utility of quality improvement techniques from obstetrical facilities where combined different cultures exist. The research was conducted using the assistance of combined methods. A revision, carried out in 1999 to 2014 evaluated the determinant of perceived values, service quality on customers' satisfaction and other selected indicators of quality of service using controlled case methodology.

The value of assessing customers' satisfaction in Nigerian public, where the organization must attempt to respond to reasonable expectation of customers. If the industries are in business to provide services for their customers, then, they must strongly consider the needs and expectation of their most important customer. Furthermore, industries are in the business for caring for customers. Customers entrust their life and wellbeing to providers. Thus, monitoring customers' satisfaction is a crucial element of organizations effectiveness and should be part of the quality improvement initiative. Preferences are essentially customers' desires and expectations about what should occur in the health care setting. There are both qualitative and quantitative methods for measuring preferences. Among the qualitative methods are individual interviews and focus group.

Following Pascoe view (Pascoe, 2023), the degree of an individual's experience compared with his or her expectations is known as satisfaction. Furthermore, customers' satisfaction is related to the extent to which customers' needs and condition-specific needs are met. Evaluating to what extent customers are more likely to conform to treatment, be interested about their own care. In addition, aviation professionals may benefit from satisfaction surveys and identify potential areas for service improvement through customer-guided planning and evaluation.

Lastly, Theodorakioglu (2018) conducted a survey about medical care in Greece. The basic aim of this survey was to verify utilities and implementations degree of quality approaches and spot basic problems that most important public institutions confront in Greece. The results of the research indicated that the implementation of quality approaches was rare and the leadership, that plays the most determinative role for the support of these approaches, privations basic education and information about quality disputes (Tsiotras, 2022).

Gap in Literature Reviews

The gaps of the research reviews public sector digitization and its causal impact on corruption reduction which include the following procedures.

Measures of Public Sector Digitization E-Service Quality

Parasuraman et al. (2015) analyzed the dimensions of E-service quality and constituted a GAP model that provides an important framework for defining and measuring E-service quality (Saat, 1999). They developed the GAP E-Service Quality Model (Figure 2) through the findings from exploratory research that contains in-depth and focus group interviews.

GAP Service Quality Model showed the key insights gained through the executive interviews and the gaps veiled by the executive interviews were shown in the marketer side (GAP 1, GAP 2, GAP 3, GAP 4), and the GAP 5 which was formed by the focus group interviews was in the consumer side of the model. The GAP relations and names were shown below (Parasuraman et al., 1985; Lovelock and Wirtz, 2017):

GAP 1: Customer expectation-management perceptions gap, (The Knowledge Gap**)**.

GAP 2: Management perception-service quality specifications gap, (The Policy Gap**)**.

GAP 3: Service quality specifications-service delivery gap, (The Delivery Gap).

GAP 4: Service delivery-external communications gap, (The Communications Gap**).**

GAP 5: Expected service-perceived service gap, (The Service Quality Gap*)*.

Lovelock (1994) added the sixth gap to the model as GAP 6: Service Delivery And Perceived Service, The Perceptions Gap. According to the responses of focus group

Participants, the judgments of high and low service quality depended on how Consumers perceived the actual service performance in the context of what they expected, and GAP 5 showed the expected service-perceived service gap.

After the Gaps modeling, the determinants of service quality that customers used when interpreting the quality. The five service quality measures and their descriptions have been identified below;

Reliability: Reliability is the quality to perform the promised service dependably and accurately. Reliability should possess the attribute of doing things by the time they promise, when customers have problems, they should be sympathetic and reassuring, should be dependable, should provide their service at the time they promise and should keep accurate records.

Tangibility: Tangibility includes physical facilities, equipment, and appearance of personnel. Tangibility should possess these items such as; up-to-date equipment, physical facilities should be visually appealing; employees should be well dressed and appear neat, appearance of physical facilities should be in keeping with the type of services.

Responsiveness: Responsiveness to help customers and provide prompt service. It should not be expected to tell customers when services will be performed; it is not realistic for customers to expect prompt service, employees do not always have to be willing to help customers, it is ok if they are too busy to respond to request promptly.

Assurance: Pledge is courtesy knowledge, ability of employees to inspire trust and confidence. Customers should be able to trust employees, customers should feel safe in their transactions with the employees, the employees should be polite, and employees should get adequate support to do their jobs well.

Empathy: empathy is caring, individualized attention the firm provides its customers. Company should not be expected to give customers individual attention, employees cannot be expected to give customers personal attention, unrealistic to expect employees to know what the needs of their customers are, unrealistic for them to have customers best interest at heart, should not be expected to have operating hours convenient to all customers.

E-Service Quality Model

The prevailing model for measuring service quality is the SERVQUAL conceived model by Parasuraman, Zeithaml, and Berry

(1985). The SERVQUAL model is a multiple item measure that can be used to identify and deduce customer perceptions and service expectations. It is considered reliable and valid for evaluating service quality in a number of industries. To develop the SERVQUAL scale, Parasuraman et al. (1985) gathered empirical data from five different service industries: appliance renovation and maintenance companies, retail banking, long distance telephone, security, brokerage, and credit cards. The SERVQUAL model initially acknowledged ten dimensions of service quality (tangible, reliability, responsiveness, communication, credibility, security, competence, courtesy, understanding, knowing customers, and access). Subsequently, these ten dimensions were suppressed into five (reliability, responsiveness, tangible, assurance and empathy).

The SERVQUAL model hinges on gaps in service quality, which addresses differences in service quality expectations and perceptions. Hutton and Richardson (1995) state that the broader the gap, the lesser the perception of quality appears in consumer minds, and vice-versa. According to Sheth and Desmukh (2004), SERVQUAL is most often applied to evaluate the presence and degree of Gap-5, which expresses the difference between customer expectations and perceptions of service quality. Mohammed (2006) notes that of the five service quality Gaps, only Gap 5 can be examined exclusively from the customer's viewpoint; that is, analyses of other Gaps require information from the service provider. Notwithstanding its effectiveness and application, several scholars have documented some limitations of the SERVQUAL model and presented alternative models to measure service quality (Espinoza, 1999; Brady, Cronin, 2001; Ladhari, 2008). These academics criticized SERVQUAL because service quality perception is contingent on numerous unique factors that are industry specific; hence, no single measurement model universally applies across industries. In particular, Cronin and Taylor (1992) claimed that SERVQUAL describes the level of customer satisfaction with a product or service and not service quality.

These scholars therefore developed the SERVPERF model in 1992 to evaluate customers overall feeling towards service delivery (Cronin, Taylor, 1992). Other notable service quality models developed to solve the shortcomings of SERVQUAL are the synthesized service quality model (proposed by Brogowicz, Delene, Lyth, 1990); the attributes service quality model (developed by Haywood-Farmer, 1988); and the pivotal, core and peripheral model (promoted by Philip, Hazlett, 1997), among others. Gilbert and Wong (2003) refined the five SERVQUAL dimensions into seven (reliability, responsiveness, assurance, customization, employee, facilities, and flight pattern). Until now, there has been no conclusive method for measuring service quality. However, researchers agreed Perceived Service Quality and Customer Loyalty. The mediating effects that the SERVQUAL dimensions are multifaceted and were vital elements in any study of service quality (Brady, Cronin, 2001).

Methodology

In order to get a good representative of the sample size and to achieve the objectives of the study in respect to the impact of E-service digitization on public sector and its contribution and impact on corruption reduction. The sources of statistics classifications is a secondary data already made public sectors of Nigerian qualitative investigations approach.

Population

The populations of these observations are the employee of the public sectors or the listed sectors Federal Ministry of Finance, Office of the Accountant-General of the Federation and Central Bank of Nigeria among others, which is a finite population. Sample is a subset of the population under examination. This is because of the reason that backed the FRN supreme Constitutions which stipulates the nature of public sectors economic administrative structure of a nation civil employee of any nation. If independent anonymous and excluded from partisan polities among others valued function of citizens of the sectors. The researcher would not employ convenient sampling technique in all cases to the select public sector. Sampling is yearly data regular set of capital expenditures used on the fact that those that are able to complete and return the attached appendix will be used.

Sample and Sampling Techniques

The sample size for this investigation consists of 43 annual capital expenditures selected CBN of observations from the public sector's national bodies.

Research Instruments

The main instrument employed for this study is the secondary data from CBN. The Data will be designed in a way to elicit information relevant to the investigation and will be divided into four proxy rows sections. Section A will consist of the labeling (data details) of expenditures while section B will contain facts and figure digit on the other hand to be designed to answer some foremost concerns addressed in the area of investigations.

Method of Data Collection

The data spanning from 1981 to 2023 report of Statistics Bulletin Public Finance. Which include the listed sectors Federal Ministry of Finance, Office of the Accountant-General of the Federation and Central Bank of Nigeria. Made up the set of observation Federal Government Capital Expenditure (₦' Billion) which include component like; Normal GDP; Administration, Economic Services, Social Communications Services and Transfers.

Method of Data Analysis

Statistical Package for analysis is E-View 10 was used to compute all statistics for the study. The statistical tools used were both descriptive and influential statistical tool. The descriptive statistical tool used was percentage distribution in tables while inferential statistical tool used was the Regression analyses and the person correlation in testing the hypothesis.

Model Specifications

The specification of a model is based on the available information to the objectives of the study in question. Here, the predictors are reason for rise in care services, service quality and perceived value and dependent variable is the factors that lead to the choice of e-services public sectors of Nigerian (Corruption reductions satisfaction trends). The model is stated below:

Measurement component were (Normal GDP) regress on (Administration, Economic Services, Social Communications Services and Transfers) modeling.

In particular; the following functions become;

CRS_t = F (e-SQ = Administration, Economic Services, Social Communications Services and Transfers)

CRS_t = f e-SQ (trustworthiness, corporeality, pledge, fellow feeling, awareness)
Such that
CRS_t $(GDP_t) = a_0 + X_1 A_t + X_2 ES_t + + X_3 SCS_t + X_4 T_t + U_t$
Where:
e-SQ means electronic service quality (Public sector digitization)
Normal GDP means the Normal Gross Domestic Product over time ($_t$) the dependent variable
A_t means Administration over time ($_t$)
ES_t means Economic Services,
SCS_t means Social Communications Services over time ($_t$)
T_t means Transfers over time ($_t$)
Means the intercept or constant over time ($_t$)
CRS_t= Corruption reductions satisfaction (Normal GDP_t) over time ($_t$)
e-SQ= e-Service Quality over time ($_t$)
U_t= stochastic white noises over time ($_t$)
$a_{1=}$Parameter Estimates
$X_1 > 0, + X_2 > 0, + X_3 > 0, + X_4 > 0.$
When CRS_t is the dependent variable and e-SQ is the independent variable over time on public sector digitization ($_t$) per annual of impact on corruption reduction

Justification of Instrument

The research instrument is justified with the listed public sectors capital expenditures on the normal GDP becomes of the HDI and globalization and technology era for uses information technology and AI administrative of any nation like Nigerian Public sector digitization performances of human and material resources expenditures of capitals for the utilities on the public sectors Nigerian populaces. In which, most ended with reductions of corruption since advancement in technology added more values on economic productivity's public sector digitization and various VATs and multiple taxations are pays through the financial sectors among others. This, in other hands improve its causal rapid impact of corruption increases or reduction in the world MDGs; SDGs and sustainability electronic service quality frauds on (Public sector digitization). With these facts checking the significant of public sector digitization over timely duration and the impact of corruption reduction needed on the various listed proxy growth and decays justification's trends and coefficients necessary needed.

Results and Discussions

In this analysis, we use Eview 10 for windows to analyzed public sectors expenditures spanning from 1981 to 2023 from CBN statistical bulletin extracted set of observations. Most characteristics that will give a meaningful interpretation of the questions to be addressed. With this, the perception of the expenditures towards e-service value, quality and satisfaction of digitalizations of public sectors could be easily determined with their various data focus on GDP job title of employee and sources of knowledge for performance HDI added in values respectively per Annual on the impact of national corruption reduction of public sectors. Again, trends unit root test, summary of level and first different, Multiple OLS and Variance test, Normality test represent both descriptive and inferential statistics respectively.

Descriptive Statistics

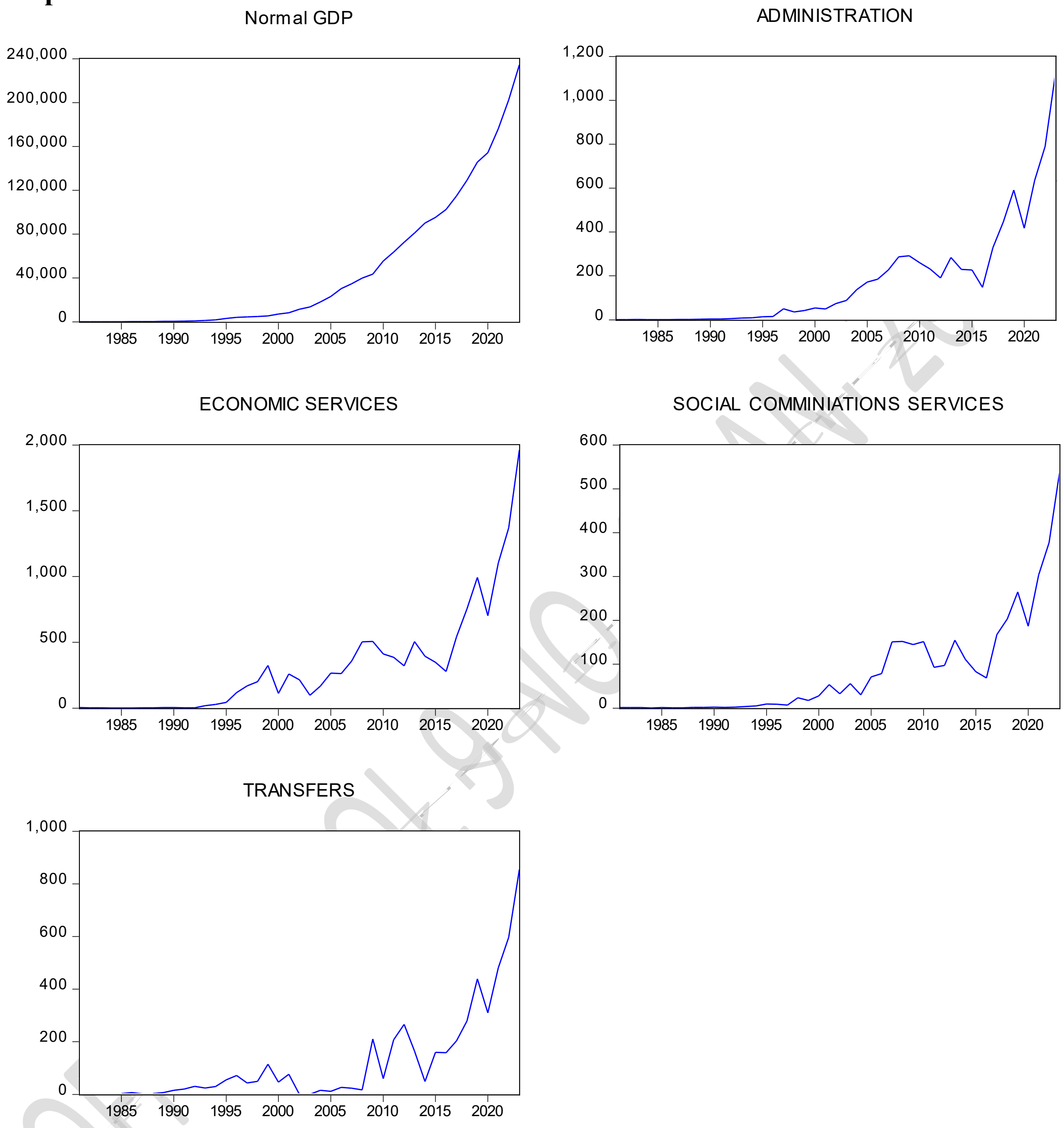

Figure 3: Analysis of Time Series Plots of Public Sectors Measures Features of Digitalizations HDI Expenditures of Sectors
Sources: Author Computations E-Views Statistics (2026)

From figure 3 above Distribution display postulated curve is known as a sine curve of seasonal fluctuations added to an expenditures exponential function in the upward direction or trend representing an unlimited growth curve in the investigation. Results findings shows that performance e-services has impact on trends of corruption not decline management governance quality on in listed public sectors unemployed statistics reported content from EFCC.

Table 1: Descriptive Statistics Analysis of Time Series From 1981 To 2023

	NORMAL_GDP	ADMINISTRATION	ECONOMIC_SERVICES	SOCIAL_COMMINIATIONS_SERVICES	TRANSFERS
Mean	45962.28	178.3250	319.7100	85.81571	119.4678
Median	11501.45	73.57740	215.3334	32.46730	43.58760
Maximum	234425.9	1130.643	1960.733	540.0636	854.7670
Minimum	139.3105	0.262700	0.656300	0.237600	0.000000
Std. Dev.	62607.66	242.0298	409.6302	115.5787	182.0690
Skewness	1.417348	2.041234	2.115769	2.001394	2.287852
Kurtosis	4.058115	7.537892	8.019549	7.428082	8.374952
Jarque-Bera	16.40290	66.75573	77.22402	63.83748	89.27369
Probability	0.000274	0.000000	0.000000	0.000000	0.000000
Sum	1976378.	7667.974	13747.53	3690.076	5137.115
Sum Sq. Dev.	1.65E+11	2460294.	7047471.	561054.1	1392263.
Observations	43	43	43	43	43

Sources: Author Computations E-Views Statistics (2026)

Table 1 illustrates the general descriptive statistics of the measures of investigate the connection between discoveries of public sector digitization and impact on corruption reduction the public financials expenditures reporting quality of listed 43 set of observations in Nigeria sectors. Based on the capital e-services measures for the sample listed years, the public sector digitization and other measures were all having positive with Mean of 45962.28; Normal GDP, Administration (A) 178.3250, Economic Services (ES) 319.7100, Social Communications Services (SCS) 85.81571, Transfers (T) 119.4678 respectively order. All the sectors has positive Skewness of digitization and its causal impact seasonality trends per annual 1.417348; Normal GDP, Administration (A) 2.041234, Economic Services (ES) 319.7100, Social Communications Services (SCS) 2.001394, Transfers (T) 2.287852 respectively. The standard deviation which measures variable variability is a bit higher and lies between 62607.66 and 115.5787 for all sectors measure.

We also observed a moderate maximum and minimum in the observed study. While all the proceeds variable is skewed and leptokurtic (highly peaked and fat tailed). The Jarque-Bera (JB) statistic greater than 5% is normally distributed among variable under examination series, quiet there is evidence of moderate (i.e. compliance) on the impact of corporate governance quality on performance fraud in listed companies on Nigeria exchange group. However, the Probability of 0.000274 Normal GDP and 0.000000 proving that we should accept the impact on corruption reduction on quality on performance positively. Thus, Public sector digitization and on and this has impact contributions on societal numerous effect corruption reduction sectors various measures security prices for values.

Inferential Statistics

Table 2: Unit Root Test: Summary Table of Level and First Different

Group unit root test: Summary						
Series: NORMAL_GDP, ADMINISTRATION, ECONOMIC_SERVICES, SOCIAL_COMMINIATIONS_SERVICES, TRANSFERS						
Date: 05/18/26 Time: 13:22						
Sample: 1981 2023						
Exogenous variables: Individual effects						
Automatic selection of maximum lags						
Automatic lag length selection based on SIC: 0 to 7						
Newey-West automatic bandwidth selection and Bartlett kernel						
	LEVEL	LEVEL	Cross-		FIRST DIFFERENT	FIRST DIFFERENT
Method	Statistic	Prob.**	sections	Obs		
Null: Unit root (assumes common unit root process)						
Levin, Lin & Chu t*	22.4204	1.0000	5	202	5.58099	1.0000
Null: Unit root (assumes individual unit root process)						
Im, Pesaran and Shin W-stat	17.4213	1.0000	5	202	-0.99727	0.1593
ADF - Fisher Chi-square	7.9E-05	1.0000	5	202	40.9561	0.0000
PP - Fisher Chi-square	2.7E-08	1.0000	5	210	78.8009	0.0000
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.						

Sources: Author Computations E-Views Statistics (2026)

From the group unit root table 2 above, the series exogenous variables: Individual effects measures were not stationary at conventional level. And stationary with first different Newey-West automatic bandwidth selection and Bartlett kernel. However, it was stationary at first difference level. The Im Pesaran and Shin W-stat and Shin W-stat, ADF –Fisher chi-square and PP - Fisher Chi-square all has statistic value of 22.4204, 1.0000, and 5.58099. 1.0000** Probabilities for Fisher tests are computed using an asymptotic Chi Respectively. With their associated p-value (for a test with 210 observation) of 0.0000 respectively, therefore, we reject the null at first difference test.

Table 3: Multiple Least Squares Regression

Dependent Variable: NORMAL_GDP				
Method: Least Squares				
Date: 05/18/26 Time: 13:10				
Sample: 1981 2023				
Included observations: 43				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ADMINISTRATION	347.3465	132.5559	2.620378	0.0126
ECONOMIC_SERVICES	-77.55472	60.65485	-1.278623	0.2088
SOCIAL_COMMINIATIONS_SERVICES	-121.3368	242.7555	-0.499831	0.6201
TRANSFERS	119.7136	57.08329	2.097174	0.0427

C	4927.428	4053.812	1.215505	0.2317
R-squared	0.907911	Mean dependent var		45962.28
Adjusted R-squared	0.898217	S.D. dependent var		62607.66
S.E. of regression	19974.00	Akaike info criterion		22.75119
Sum squared resid	1.52E+10	Schwarz criterion		22.95599
Log likelihood	-484.1507	Hannan-Quinn criter.		22.82671
F-statistic	93.66069	Durbin-Watson stat		0.815169
Prob(F-statistic)	0.000000			

Sources: Author Computations E-Views Statistics (2026)

Table 3 illustrate 43 Sample from 1981 to 2023 with R of 0.907911 among Public sector digitization degree of relationship among features component Adjusted R-squared 0.898217 89.8% general multiple OLS intercept Coefficient with 4927.428 (42.8%) measures positive F- statistic of (0.000000) which reveals the joint significance of all estimated parameter in predicting the value NORMAL GDP (HDI) Expenditures dependent variable, is statistically significant with value of 63.18428 and the p-value of 0.2317 Also, Durbin-Watson stat of 0.815169 shows that there is no evidence of the element of positive autocorrelation meaning that there is no linear relationship between Public sector digitization and its causal impact on corruption reduction

CRS_t (Normal GDP_t) $= a_0 + X_1 A_t + X_2 ES_t + + X_3 SCS_t + X_4 T_t + U_t$

Normal GDPt $= 4927.428 + 347.3465 A_t + -77.55472\ ES_t + + -121.3368\ SCS_t + 119.7136\ T_t + U_t$

Where: e-SQ means electronic service quality (Public sector digitization)

The inference of this were that (a slope of 4927.428 (42.8%) growth coefficient per annual of 5% likelihood increase in each measure of the multiple linear component of performance HDI e-qualities public sector digitization degree of relationship among features component on corruption reduction by (security) of who had explanations with expenditures might cause an increase in growth of the respective measure this implied (a>1 is satisfied). using the multiple OLS as evidence. Suffices to say that, this general findings of NORMAL_GDP has effect on public sector digitization degree of relationship among features component.

Table 4

Variance Inflation Factors			
Date: 05/18/26 Time: 13:12			
Sample: 1981 2023			
Included observations: 43			
	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
ADMINISTRATION	17571.06	168.5793	108.3565
ECONOMIC_SERVICES	3679.011	105.5187	64.98820
SOCIAL_COMMINIATIONS_SERVICES	58930.24	129.6476	82.87300
TRANSFERS	3258.502	16.38382	11.37128
C	16433390	1.771192	NA

Sources: Author Computations E-Views Statistics (2026)

Variance Inflation Factors of C of 16433390 = 1.771192 unCentered measures the that there is evidence of present of VIF, the variance inflation factor (VIF) measures the effect of collinearity among the component in the regression model. VIF is 1/tolerance in addition, the tolerance value is exactly 1, and this further substantiates there is no absence of multicollinearity in the examinations. Based on these key findings, the analysis revision therefore concludes and recommends that public sector there is no influence on corruption reduction in Nigerian public sectors.

Table 5: Test for Equality of Variances Between Series

Test for Equality of Variances Between Series				
Date: 05/18/26 Time: 13:20				
Sample: 1981 2023				
Included observations: 43				
Method		df	Value	Probability
Bartlett		4	1555.690	0.0000
Levene		(4, 210)	78.06015	0.0000
Brown-Forsythe		(4, 210)	25.52273	0.0000
Category Statistics				
			Mean Abs.	Mean Abs.
Variable	Count	Std. Dev.	Mean Diff.	Median Diff.
NORMAL_GDP	43	62607.66	49951.37	43639.90
ADMINISTRATION	43	242.0298	173.1063	162.8434
ECONOMIC_SERVICES	43	409.6302	281.3382	269.0089
SOCIAL_COMMINIATIONS_SERVICES	43	115.5787	84.29161	78.21362
TRANSFERS	43	182.0690	129.1228	107.2066
All	215	33261.72	10123.85	8851.434
Bartlett weighted standard deviation: 27999.97				

Sources: Author Computations E-Views Statistics (2026)

Test of Research Hypothesis

This presented that the null hypothesis, were specified using significant difference effect was established in the model. The following hypothesis were tested.

Decision Rule: Reject H_O if P-value is < 0.05 otherwise do not reject H_O.

The ANOVA is used to investigate the possibility of a significant difference between the various measures as seen in the table. Consequently, as expected and documented in the robust test, we accept all the alternate hypothesis for means. Which implies that there is no significant difference modification between impact on corruption reduction reporting e-services quality on listed public sectors in Nigeria. We can also infer from the Nigerian e-fraud context that these measures captures varies aspects of financial reporting digitalizations in the listed CBN Sectors observations.

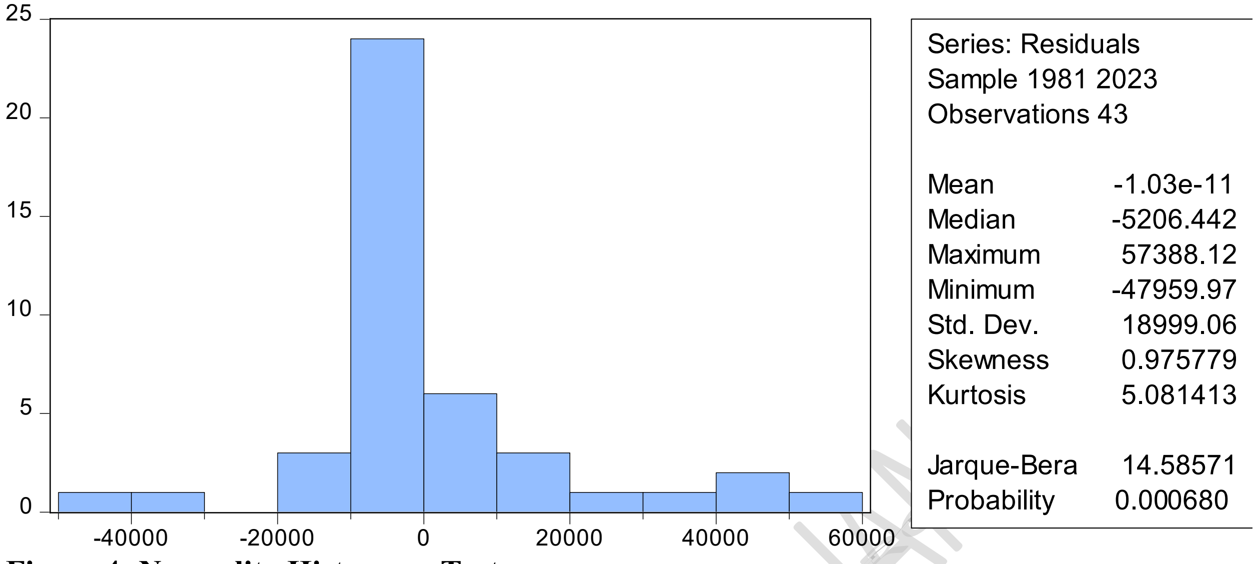

Figure 4: Normality Histogram Test
Sources: Author Computations E-Views Statistics (2026)

Normality Test: This test is again very important to find out whether the researchers, in forming hypothesis argued that the quality of corporate governance has a positive effect on the corporate image of Nigeria on Nigeria exchange group follows a Normal Distribution and the hypotheses are clearly stated as follows:

Ho: There is no evidence of significant difference of public sector digitization and its causal impact on corruption reduction Residuals are normally distributed over time (The normal human population has mean) versus;

H1: There is evidence of significant difference of public sector digitization and its causal impact on corruption reduction Residuals are not normally distributed over time

Again, if the Probability value > 0.05 then we can accept H_O.

The further strength hence the jarque-Bera statistics reported in figure 3. The findings signify a bell-shape histogram with means of -1.03e-11.

The normality histogram reveals the set of data positively that is skewed to the frequency curve right and jarque-Bera value of 14.59571 and associated probability value of 0.000680 which signifies normal distribution (Normality) of the multiple regression models for the H_1: There is evidence of significant difference of public sector digitization and its causal impact on corruption reduction Residuals are not normally distributed over time. Thus; we can accept the alternative hypothesis. The Residuals over current time are normally distributed hence data has passed the normality test by positively skewed growth. Therefore, this figure proceeds for further analysis by listed directors and managers of listed sectors for innovative of Nigeria progressing digitization and its corruption reduction.

Summary

This investigation pursuit and seeks to determine public sector digitization and its causal impact on corruption reduction. In particular, to measures to enhance public processes more transparent, efficient, and less prone to corruption including through the use of digital. To determine how effective is The ICT use through e-government portals /webs and their contributions to corruption reduction in public sector and to determine if corruption reduction activities are effective on features such as bribery by making more information available to the public. The data spanning from 1981 to 2023 report of Statistics Bulletin Public Finance. Which include the listed sectors Federal Ministry of Finance, Office of the Accountant-General of the Federation and Central Bank of Nigeria. Made up the set of observation Federal Government Capital Expenditure (₦' Billion) which include component like; Normal GDP; Administration, Economic Services, Social Communications Services and Transfers On the other hand Eview 10 were used to analyzed the data. The data spanning from 1981 to 2023 report of Statistics Bulletin Public Finance. Which include the listed sectors Federal Ministry of Finance, Office of the Accountant-General of the Federation and Central Bank of Nigeria. Made up the set of observation Federal Government Capital Expenditure (₦' Billion) which include component like; Normal GDP; Administration, Economic Services, Social Communications Services and Transfers. e-SQ means electronic service quality (Public sector digitization).

The inference of this were that (a slope of 4927.428 (42.8%) growth coefficient per annual of 5% likelihood increase in each measure of the multiple linear component of performance (HDI) e-qualities Public sector digitization degree of relationship among features component on corruption reduction by (public security sectors) of who had explanations with expenditures might cause an increase in growth of the respective measure this implied (a>1 is satisfied) . using the multiple OLS as evidence. Suffices to say that, this general findings of NORMAL GDP has effect on public sector digitization degree of relationship among features component. Also, Durbin-Watson stat of 0.815169 shows that there is no evidence of the element of positive autocorrelation meaning that there is no linear relationship between public sector digitization. The normality histogram reveals the set of data positively that is skewed to the frequency curve right and jarque-Bera value of 14.59571 and associated probability value of 0.000680 which signifies normal distribution (Normality) of the multiple regression models for the H_1: There is evidence of significant difference of public sector digitization and its causal impact on corruption reduction Residuals are not normally distributed over time.

This examined the impact of public sector digitization e-service quality on customer satisfaction and key attributes affecting customers' satisfaction. The findings of the study, tangibility, reliability, responsiveness, assurance, empathy and perceived value were the attribute that influence customers satisfaction. The perception of service quality and perceived value along all dimension being rated vary from the perception of customers. The data of the study were obtained with the use of well-structured observations that were administered to 210 of public sector digitization. are flight attendants. It infers that most of the important employees are holding a significant post in the public sectors which gives the entirely a complete recognition around the market segment.

However, the f-test (ANOVA) performed showed that the independent variables have significant effect on customers satisfaction at 5% shows that Reality, Reliability, Pledge, Responsiveness, Fellow feeling and perceived value all have significant impact on customers satisfaction of variation at 5%. Further research could be allowed for other branches of CBN public sectors such as Lagos, Abuja, Enugu, Kwara, Kano Kaduna, Osun, Port Harcourt etc. The regression analysis proved that the coefficient value shows that there is a positive relationship between the attributes of e-e-service quality, perceived value and customers' gratification.

Conclusion

From these results findings generated in this sector, the following conclusions were made: Many Public sectors should pay more attention to E-service quality as an important component for their competitive advantage, which is believed to be a mandatory factor for retaining and improving their level of E-service and competitiveness among others. To develop E-services, they need to design webs and sites a valid measurement system for ICTs (MISs) service. Therefore, determining citizens; customers' prospects satisfaction and tis dimension in a unique for must be part of the effort made by any public sector especially a service provider such as a public sector this will have impact on corruption reduction.

The Beverton- Holt Economic Recruitment Growth Curve approach to time series analysis and control is very good for all component of Normal GDP. Therefore, time series model is suitable for modeling public sectors Nigeria's components and contributors which include; capital expenditures of Nigeria public financial data of Nigeria. Economic development point out that Nigeria's economy is presently of more than one leading sectors which are services sector digitization and its causal impact on corruption reduction. Respectively. Finally, it was found that Normal GDP played a significant role as it affect the economic sector digitization growth in Nigeria and its instrumental impact on corruption reduction.

Policy Recommendations

From the above findings with conclusions, this investigation therefore recommends that:

1. Many public sector along with Industries should pay more attention to E-service quality as an important component for their competitive advantage on corruption reduction, which is believed to be a mandatory dynamic for retaining and improving their level of E-service and competitiveness among others public sector digitization.
2. E-Service quality, perceived value attributes should include among other things to bring about development in all part of country public sector. This will equally complement the E-government effort at making life more meaningful for citizen at large.
3. The theories also revealed that the public sector in their E-service quality activities and the value perceived by customers would lead to continuous relationship that will lead to higher profit for the industry. Thus, the public sector should improve their quality of service in order to earn higher profit Economic and sustainability values.
4. This research will improve effectiveness policy in public sectors quality of E-management (MIS) and (ICTs) by influencing their economic fraud decay.

5. Nigerian's people and rest of the world should ignore political instability, economic mismanagement, corruption or frauds and other negative factors on their nation economy. Which will be an impact on corruption reduction public sector digitization E-services.

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Appendix

YEAR	Normal GDP	ADMINIS TRATION	ECONOMIC SERVICES	SOCIAL COMMINIATIONS SERVICES	TRANSFERS
1981	139.3	0.72	3.63	1.30	0.92
1982	149.1	0.39	2.54	0.97	2.52
1983	158.8	1.10	2.29	1.03	0.47
1984	165.9	0.26	0.66	0.24	2.94
1985	187.8	0.46	0.89	1.15	2.96

1986	198.1	0.26	1.10	0.66	6.51
1987	244.7	1.82	2.16	0.62	1.78
1988	315.6	1.90	2.13	1.73	2.59
1989	414.9	2.62	3.93	1.84	6.65
1990	494.6	2.92	3.49	2.10	15.55
1991	590.1	3.35	3.15	1.49	20.36
1992	906.0	5.12	2.34	2.13	30.18
1993	1,257.2	8.08	18.34	3.58	24.50
1994	1,768.8	8.79	27.10	4.99	30.04
1995	3,100.2	13.34	43.15	9.22	55.44
1996	4,086.1	14.86	117.83	8.66	71.58
1997	4,418.7	49.55	169.61	6.90	43.59
1998	4,805.2	35.27	200.86	23.37	49.52
1999	5,482.4	42.74	323.58	17.25	114.46
2000	7,062.8	53.28	111.51	27.97	46.70
2001	8,234.5	49.25	259.76	53.34	76.35
2002	11,501.5	73.58	215.33	32.47	0.00
2003	13,557.0	87.96	97.98	55.74	0.01
2004	18,124.1	137.77	167.72	30.03	15.73
2005	23,121.9	171.57	265.03	71.36	11.50
2006	30,375.2	185.22	262.21	78.68	26.27
2007	34,675.9	226.97	358.38	150.90	23.04
2008	39,954.2	287.10	504.29	152.17	17.33
2009	43,461.5	291.66	506.01	144.93	210.20
2010	55,469.4	260.20	412.20	151.77	59.70
2011	63,713.4	231.80	386.40	92.85	207.50
2012	72,599.6	190.50	320.90	97.40	265.90
2013	81,010.0	283.65	505.77	154.71	164.27
2014	90,137.0	229.63	393.45	111.29	48.75
2015	95,177.7	226.81	348.75	82.98	159.82
2016	102,575.4	147.72	278.95	68.80	158.14
2017	114,899.2	328.94	542.19	167.66	203.51
2018	129,086.9	446.25	753.49	203.42	278.94
2019	145,639.1	591.26	994.19	264.69	438.86
2020	154,252.3	417.14	701.40	186.74	309.61
2021	176,075.5	635.73	1,102.46	303.66	480.61
2022	202,365.0	789.81	1,369.66	377.26	597.09
2023	234,425.9	1,130.64	1,960.73	540.06	854.77