



IMPROVING ELECTRICITY SUPPLY THROUGH INTERNAL QUALITY CONTROL MEASURES: THE CASE OF NORTHERN ELECTRICITY DISTRIBUTION COMPANY (NEDCo), GHANA

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ABSTRACT

Across the globe, the supply of quality electricity and timely provision of requisite services are very important to consumers. However, in Ghana, the quality of service provided by public electricity companies hardly meet expectations of consumers and regulatory bodies. Dissatisfaction with quality of electricity supplied to clients has strained relationship between electricity providers and their clients. In its quest to improve service quality the Northern Electricity Distribution Company (NEDCo) implemented a set of internal quality control measures. In this paper, we assess quality measures rolled out by NEDCo from the perspectives of internal staff of the organisation. Findings show that service delivery improved albeit temporarily following the introduction of quality control measures. However, interference from political and religious authorities, lack of commitment on the part of the staff and some poor levels of coordination were the key constraints militating against quality service delivery in NEDCo. We recommend a review of NEDCo's current service quality strategies and internal control measures, and realign them through, first, controlling drawbacks to smooth operations, assessing, and mitigating internal risk factors that affect quality service delivery, and second, establishing a strong arbitrator, to deal with external interferences in the company's operations.



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1. INTRODUCTION

Quality service delivery remains a crucial element in today's globalised and changing world (Roy et al., 2015). For electricity companies in particular, providing quality of service is crucial in deriving revenues and meeting customer satisfaction (Alzaydi et al., 2018). Broadly

electricity is used for domestic and industrial purposes. Domestic uses include lighting, ironing, refrigeration, air conditioning, television, radio, water heaters, and electric cookers. Industrial purposes are basically for operating machines for production in mining, agriculture, manufacturing, and transportation. Over the years, concerns have been raised regarding the quality of

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service provided by public electricity distribution forms in Ghana. Power outages are rampant. It takes unacceptable periods to connect new customers to the national grid. Delays in fault repairs and challenges with resolution of billing complaints have been identified as major issues with the power sector in Ghana (World Bank, 2018). The Northern Electricity Distribution Company (NEDCo) was no exception to what appears to be a norm in Ghana's power sector. On several occasions, customers have expressed dissatisfaction with quality of services provided by the company. Long queues at the company's customer service centers and delays in connecting new homes and businesses to electric power have been characteristic of the services delivered to clients.

For new service connections, a waiting period of 6 to 18 months was to be expected by customers who desire to connect their homes or businesses to electricity. Faults reported were hardly repaired for reasons ranging from non-availability of linesmen to lack of transport and shortage of materials. A customer's relationship with individual staff was often a prerequisite for getting a fault repaired or connecting a new home or business. Delays in bill production and delivery were typical of NEDCo's customer service units. While there existed a process for passing adjustments to correct billing errors, the system was fraught with several irregularities leading to undue delays in resolving billing errors beyond the stipulated two normal billing cycles. In some cases, billing complaints were never resolved except where the customer had an acquaintance among staff or was prepared to influence staff in one way or the other.

These developments created a blurred image for the company and brought additional challenges. For instance, incidents of self-connection—which is considered an illegal practice—by prospective customers seeking service connection leading to an unacceptably high number of unbilled customers in the system were reported. In 2003, a survey of 200 prospective customers who applied for service connection revealed that 189 (94.5 percent) of them had been illegally connected by non-certified electricians and were enjoying power without being billed. Only 11 (5.5 percent) were awaiting approval from the company to have their facilities connected to the national grid. This development and the lackadaisical approach to work by management and staff was a major cause of the 43 percent loss NEDCo had been grappling with since 2003 (“Daily Guide Newspaper”, 2021). Besides, these developments, electrocution due to non-repair of faults and casual responsiveness to customer demands resulted in rampant invasion of the company's premises by frustrated customers, demonstrating against management for inefficient services provided and, in some instances, assaulting staff (Alve, 2017). It often took the intervention of the police, and in extreme cases, the military to disperse demonstrators and agitated customers. In some cases, customers who experienced

low voltages and frequent outages engaged electricians to illegally move their service lines to phases on the distribution lines perceived to be stable leading to imbalance, overloading of those phases, and eventual damage of transformers.

It became apparent that steps had to be taken to resuscitate the company as its mission “to supply safe and reliable electricity to homes and businesses in northern Ghana and neighbouring countries in a commercially viable manner” (NEDCo, 2019) appeared to be unachievable. It became clear that the company needed to re-strategise to halt the downward spiral in service delivery. To this end, management began to implement some internal quality management principles, aimed at improving the quality of electricity supplied to their clients. In this paper, we examine the quality measures implemented by NEDCo from the perspectives of internal staff of the organisation. Given that most studies on quality service delivery in utility sectors in Ghana focus largely on customers and their perceptions of satisfaction (Agyapong, 2011; Li et al., 2019; Pina et al., 2014; Ojo et al., 2014), it is important to understand service quality from the lens of personnel of utility companies. Hence, we focused on staff of NEDCo to showcase their perspectives on their services. Crucially, the paper seeks to ascertain whether the implementation of internal control management principles have led to improvement in services delivered by the company. The next section presents TQM as a tool for enhancing quality delivery in utility organisations. This is followed by some perspectives on internal quality control principles and how they drive quality service delivery and customer satisfaction.

2. LITERATURE REVIEW

2.1 Enhancing service delivery in electricity supply: perspectives from Ghana

The need for continuous improvement in service delivery has resulted in the application of Total Quality Management (TQM) as an important tool for providing efficient and reliable service to clients (Chang et al., 2003). In the view of Flynn and Schroeder (1994), TQM has emerged as an integrated approach to achieving and sustaining high-quality output, focusing on maintenance and continuous improvement of processes and defect prevention at all levels and in all functions of the firm, to meet or exceed customer expectations. Following successful implementation of TQM by various utility service providers in Bangladesh and the United States, other countries in Asia and South America followed suit. Utility companies in these regions began to implement quality control measures to redeem their image and improve customer satisfaction. The result was a turnaround from previously non-performing companies to companies that deliver quality service to their clients (Flynn & Schroeder, 1994)

In Ghana, expectations of electricity users concerning the quality of power supply are in line with the broad objectives of NEDCo which is derived from its mission to supply uninterrupted power to its customers. However, there are significant bottlenecks in electricity supply in Ghana generally, which are often beyond the control of electricity companies. For instance, transmission lines are vulnerable to weather conditions such as rainstorms, flooding, traffic accidents, and major switching operations which come in their fold with equipment failure or undesirable surges. Furthermore, power problems affecting equipment are often generated locally within a facility from any number of situations, such as local construction, heavy start-up loads, faulty distribution components, and even typical background electrical noise (NEDCo, 2019). These situations are bound to happen and will have consequences on the quality of electricity supply irrespective of interventions made by power companies. Conversely, electricity users who are at the end of the supply value chain expect to always enjoy quality electricity supply (NEDCo, 2019). On the other end, electricity producers and distributors have often argued that uneconomic electricity tariffs coupled with the inability of the government to provide a continuous stream of subventions, funding, and sovereign guarantees have exacerbated their operational and financial challenges [Public Utility Regulation Commission (PURC), 2020].

Over the years, dissatisfaction with the quality of electricity supplied to clients remains a major issue in Ghana's energy sector. Households and institutions that rely on electricity supply have lamented the poor quality of service churned out from NEDCo. The complaints include delays in connecting new services, frequent power outages, delays in repairing faults, careless responsiveness to complaints in the resolution of wrong billing among others (Public Utility Regulation Commission, 2020). In addition, there appeared to have been some level of dissatisfaction among staff of the company regarding their inability to discharge their responsibilities effectively which has on some occasions led to public agitations, assault of staff, and even destruction of company property.

The bleak situation in power supply compelled the country's energy sector regulatory body, the Public Utility and Regulatory Commission to call on NEDCo to improve the quality of electricity supplied to consumers. Indeed, there have been occasions that the PURC decided that until there is a significant improvement in the quality of electricity supply, there cannot be any tariff increase by utility companies (Public Utility Regulation Commission, 2020). These issues triggered the implementation of internal quality control measures, as will be highlighted in the analysis section, to turn things around and ensure efficient quality service delivery by staff of NEDCo. The literature offers some explanations on how internal control measures can enhance quality service. These are outlined in the proceeding section.

2.2 Internal quality control principles: pathways towards quality service delivery

The term "quality control principles" has attracted a lot of attention over the years and has become one of the most popular expressions in contemporary literature as a distinguishing metric for attaining organisational success and growth (Aven, 2018). Quality control concept is a process driven by an organization's structure that, when effectively applied, ensures growth and progress (Schandl & Foster, 2019). Fundamental reasons to adhere to internal quality control is that it provides a structure that ensures efficient use of resources, encourages constant flow of information, and improves adherence to project suggestions and policies, all of which assist an organization to achieve its objectives. Every quality control management system's conceptual underpinning is its interconnected components, which should work together to produce desired results (Schandl & Foster, 2019). Long and Jeremy (2019), in support of Schandl and Foster's (2019) assertion, claimed that effective implementation of internal control principles can protect an institution's resources from loss or misuse. To reap the full benefits of properly implemented internal quality control measures, a company must be willing to embrace new strategies, introduce relevant methods and procedures, as well as match sectional actions with the company's cultural environment (Ministry of Water and Environment, 2018).

The literature (Ofori, 2011; Jönsson & Berglund, 2016) suggests that internal quality control principles are crucial in delivering high-quality services and organisations should not overlook these principles if they want to attain efficiency and satisfy their clients. In line with the foregoing discussions, Ntongo (2012) has established that effective internal production control principles support large-scale manufacturing firms to meet production and supply deadlines. Organizations with well-structured internal management control principles are able to produce adequately and efficiently to fulfil clients' expectations (Nadkarni, 1995; Umar et al., 2018). As a result, internal control measures ensure effective resource utilisation and efficiency (Ministry of Water and Environment, 2018). Strong internal quality control, according to Nadkarni (1995), can guarantee proper use of funds on planned organisational activities, support investment of idle funds, and cause regular monitoring of returns for future decision making.

Monitoring activities is a key driver of excellent service delivery in the context of quality management. According to Ntongo (2012), monitoring gives critical input on whether supply of services will impact clients and the organization. Furthermore, it gives information that may be used to detect changes in performance and track patterns over time (Otieno, 2016). The goal is to guarantee that businesses are operating as planned and that their systems are strengthened to respond to changes over time (Long & Jeremy, 2019). Crucially, monitoring

assesses the extent to which an organization's fundamental aim is spelled out in the definition of its core existence (Long & Jeremy, 2019).

Studies have shown that good information influences organizations ability to make better decisions that result in desired outcomes. This means that information for solving crucial problems must be current, accurate, and readily available. Furthermore, for information to serve its intended function, it must be delivered to the appropriate individuals or sections (Long and Jeremy, 2019). As firms become more focused on needs and concerns presented by clients, there is a chance that service quality will improve as communication improves (Umar et al., 2018). As a result, effective communication becomes a one-of-a-kind predictor of high-quality service delivery (Umar et al., 2018). Furthermore, communication is critical in all aspects of high-quality service delivery. Employee responsibilities are made easier by complete and timely communication, which incorporates their demands as needed (Umar et al., 2018). To this end, all communication techniques must be monitored to get better results in terms of accomplishing organizational objectives.

Effective control actions have been viewed as critical to increasing quality service delivery (QSD) (Otieno, 2016). Moreover, Service quality is dependent on knowledge of organizational control operations. The quality-of-service delivery is also directly influenced by effective and efficient processes (Paulo et al., 2019). Control activities, in this view, are activities that offer evidence on the status of the organization and the actions that need to be performed. As indicated by Nadkarni (1995), the aforementioned steps must be backed by internal quality control principles and objectives, procedures, and policies that allow managers to address risks in a timely, effective, and efficient manner. As a result, risk assessment is critical in reducing hazards and achieving service quality (Australian Council of Healthcare Standards (ACHS), 2018; Long and Jeremy, 2019).

It is important to note that, the procedures of risk assessment and service quality are not separate (Aven, 2018). They collectively offer a system for assessing organisations operations, examining the processes involved, and determining how performance can be improved (ACHS, 2018). Organizations that have successfully integrated risk management have been found to have reciprocating quality improvement scenarios (Umar et al., 2018; ACHS, 2018; Aven, 2018). As a result, for any company's programmes to be properly implemented, the organisation in question must adhere to the protocols set forth. Similarly, the governing authority—in the context of this paper, NEDCo's management—must provide sufficient resources to competently mitigate, regulate, and govern all risks in the business (ACHS, 2018; COSO, 2013).

From the foregoing perspectives, it can be inferred that internal quality control principles are critical indicators of quality service delivery in organizations (Aven, 2018). They constitute important pathways toward attaining quality service delivery. Therefore, for an organisation like NEDCo marked by poor customer service delivery, adopting internal control principles is seen not only as a mechanism for regaining confidence in their clients but also a key strategy for building positive image and attracting government support.

3. MATERIALS AND METHODS

The case study organisation, Northern Electricity Distribution Company (NEDCo) is a wholly-owned subsidiary of Volta River Authority (VRA), the main company responsible for generation of power in Ghana. Initially, NEDCo was established as a department in VRA to distribute electricity generated from the Akosombo Dam to the northern part of the country. In June 1994, as part of the Power Sector Reform (PSR) programme aimed at bringing efficiency and managerial effectiveness in Ghana's energy sector, the department was converted to a subsidiary of VRA to help improve service delivery to consumers. Currently, NEDCo has five operational areas with its head office in Tamale. The operations of NEDCo currently cover 64 percent of the geographical area of Ghana including Northern, Bono, Bono East, Upper East and Upper West, Oti and Ashanti Regions (see Figure 1).

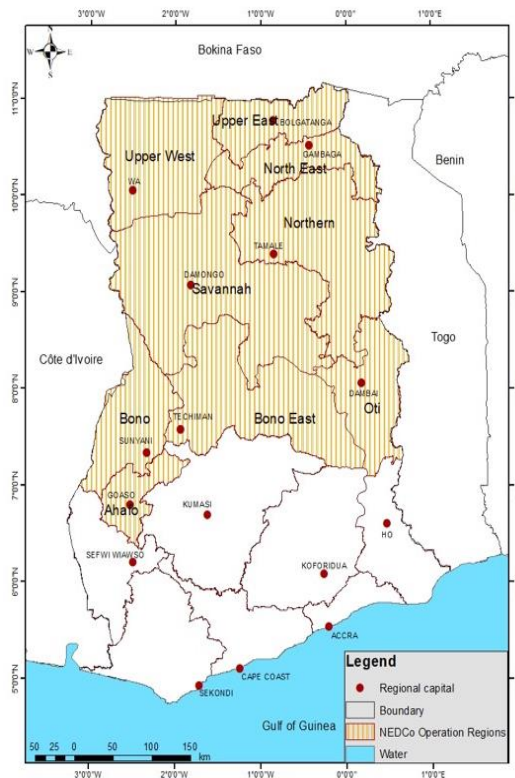


Figure 1. Map of Ghana showing NEDCo's operational area

We used a cross-sectional survey design (Creswell, 2003) to help gain detailed insights from staff of NEDCo on quality control measures implemented by management to improve service delivery.

The descriptive design has been criticised for being narrow in scope and limiting analysis of events, concepts, and theories to only what they are without exploring the in-depth components of such concepts (Creswell, 2003). This notwithstanding, the descriptive design helps to obtain data fairly easily to help provide a snapshot assessment of a phenomenon (Sarantakos, 2005). Considering that the study examined perspectives of internal staff, the descriptive design facilitated detailed insights into how staff of NEDCo viewed internal control measures implemented by management and how this improved service delivery or otherwise.

We relied on purposive sampling technique to select seven staff of NEDCo based on their job descriptions and positions in various departments in the organisation. Thus, seven (7) departmental heads whose function has a bearing on service delivery were contacted for interviews (see Table 1).

Table 1. Category of Respondents

Department	Number
Head of Managerial Department	1
Head of Technical Department	1
Head of Accounting Department	1
Head of Human Resource Department	1
Head of Commercial and Sales Department	1
Head of ICT Department	1
Head of Community Relations Department	1
Total Number	7

In-depth interview guides were used to facilitate interviews with departmental heads. Broadly, interviews centered on internal control measures being implemented, mode of implementation, impact on service delivery and challenges associated with the introduction of quality control in the organisation. Interviews were tape-recorded after securing informed consent from interviewees and later transcribed manually. Relying on thematic incident technique, the transcribed data were processed into Microsoft word format and grouped into themes out of which various quotes that emerged were used to present the results of the study.

4. RESULTS AND DISCUSSION

This section presents findings from the study. It is organised under two broad themes. The first part looks at staff perspectives of internal quality control measures management of NEDCo implemented and how these sought to improve electricity service delivery. The second part highlights challenges that came along with

the implementation of quality control measures. Together, discussions in these two sections leads to suggestions on the way forward for the company in respect of using internal control measures to improve service delivery within its operational area.

4.1 Implementation of Internal Control Measures to improve Service Quality

The study sought the views of respondents on the adoption and application of internal quality control principles by top management of NEDCo as a mechanism for improving the quality of electricity supplied to clients. One of the most important components of internal management control principle that management implemented is ‘efficiency in utilization of resources. Regarding this principle, interviews with management and staff sought to ascertain whether the organisation had taken steps to ensure efficient utilisation of resources. Managers of the various units admitted that employees turn up to work on time and were assigned the right duties. The managers also indicated that funds and the logistics of the company were put to good use. The head of one of the sections shared the following perspective:

Our employees have always made themselves available, reported to work, and worked hard at all times to ensure timely service delivery (Head of the Managerial Section of the NEDCo).

Another internal quality control measure that was found to be connected to improving and enhancing productivity and efficiency in service delivery in NEDCo is the promotion of organisational work culture. If the needed reforms towards service quality are to occur, the right work culture must be developed (NEDCo, 2017). A significant proportion of interviewees agreed that creating awareness of the need to offer quality services to customers is key to attaining efficient service delivery and that this is an ongoing process. Heads of various sections disclosed that they were willing to adapt to ‘new’ changes required to meet the demands of their customers. This implies that the staff of NEDCo have the right mindset or organizational culture that is needed to provide improved services to clients. On whether or not management by the organisation brought valuable products to determine efficient use of resources, interviewees indicated that the quantity of electricity produced was not adequate to supply all the consumers on the consumption schedule of the company. This implies that even though workers and funds were available at production premises, the company was not efficient in terms of providing adequate power to clients.

One of the internal quality dimensions required to make employees work to expectation is training and empowerment. Adequate training equips personnel to sharpen their skills, make critical decisions, and act with less supervision. On this subject, respondents agreed

largely with most of the statements built on employee empowerment and training. The respondents agreed (80 percent) that NEDCo empowers rather than control employees. Similarly, a significant proportion of respondents indicated that the organization encourages them to come up with new ideas and recommendations for improving productivity. Besides, they pointed out that personnel received the needed training and safety equipment to boost their performance. It is implied from these interactions with section managers that most staff are involved in decision-making and facilitation in their duties rather than responding to authoritarian control which tend to undermine personnel motivation. This notwithstanding, some of the section managers revealed that they do not have the authority to take actions on their own, a development that tends to slow down performance and possibly impact service quality.

Monitoring and evaluation of organisational operations are vital quality control components that help to promote efficiency (William & Douglas, 2014; Otieno, 2016). Monitoring and evaluation provide vital feedback on the quality of services delivered and whether the delivery of services makes any difference to clients and consumer preferences (Otieno, 2016). Based on the ideas shared by Otieno (2016), the managers were interviewed to find out if they ensured that all aspects of production are monitored and evaluated. The head of Community Relations Department disclosed that monitoring and evaluation exercises have been done very well. He disclosed as follows:

We always monitor and evaluate the progress of work to ensure that all complaints of consumers are addressed appropriately. I can say that monitoring and evaluation is one of the things we consider very important in this organisation (Head of the Community Relations Department, NEDCo).

In the human relations literature, experts such as Aven (2018) have cautioned that the time in production that monitoring is done is very important. In respect of this observation, we sought to find out if the systems for monitoring in NEDCo were set up and implemented at the right time to support electricity distribution. Indeed, it was revealed that the monitoring system was set up on time and this helped to proactively respond to variations in market dynamics such as changes in external factors particularly demand and supply conditions.

The relationship that an organisation especially a utility company like NEDCo builds with its suppliers is essential in contributing to quality service delivery. The energy sector in Ghana is set up in such a way that NEDCo relies on Volta River Authority (VRA) for generation of electricity and Ghana Grid Company (GRIDCo) for transmission of electricity to NEDCo's supply points for distribution to homes and businesses. This implies NEDCo relies on suppliers for quality raw materials, and on customers through power supply, to

remain in business. On supply chain management, interviewees pointed out that materials or supplies received are taken through a quality test to ensure they meet safety standards and hence clients' demands. They also indicated that there is regular communication between the company and its suppliers and customers. This implies that NEDCo maintains a cordial relationship with its suppliers, a dimension in TQM identified by Ishik (2005) as a key factor in improving service quality.

The findings also revealed that although NEDCo appears to be the sole electricity supplier to the northern part of Ghana at the moment, it has not focused very much on its clients as customer satisfaction was a major issue interviewee cited to be impacting on the image of the organisation. For instance, most of the section heads interviewed disagreed that priority attention has been given to customer needs. They were concerned that the company could not respond quickly to customer complaints. As a public utility provider that is positioned at the downstream end of the energy supply chain, customer service delivery should be at core of NEDCo's business model. But this was not the case as would be shown in the next section where interaction with officials revealed no regular method of assessing customer satisfaction in the organization. Improved access to information and communication technology (ICT) can facilitate the development and implementation of quality service measures. ICT remains a core strategy of organizations that seek to adopt or implement TQM principles to drive efficiency. The results from interviews conducted showed that NEDCo has failed to utilise ICT to improve customer service delivery. Departmental heads were concerned about abysmal investments in ICT and how this could impact the fortunes of the company particularly, service delivery.

However, in terms of internal communication with staff, most of the interviewees agreed that the company communicates its strategies and goals with employees timely. At the same time, some of them complained about lack of regular feedback on performance developments. The findings on this dimension of service quality show that not only did NEDCo fail to communicate its goals or strategies to staff and by extension to customers, but it also failed to make extensive use of ICT in its communication and delivery services to clients. The respondents also disagreed, to a large extent, that there are comminution benchmarks and thus self-assessment systems for tracking quality and reducing the cost to improve service quality.

According to the World Commission on Environment and Development (WCED, 2017) development that is sustainable is one that benefits today's generation without compromising the ability of the environment to meet the needs of future generations. In this regard, organizations that adopt total quality management principles, besides meeting customer satisfaction must ensure that their operations do not compromise

environmental safety. It was revealed during interviews that NEDCo's activities are carried out in such a way as to minimize their impacts on the environment and local communities. The Community Relations Manager indicated that the company takes full account of environmental impacts in the selection of products and materials. He disclosed that:

NEDCo's activities are carried out in such a way that will minimize any negative impacts on people and the environment. We take into consideration the selection of products and materials that will not destroy the environmental resources in this area.

As a company operating in the energy sector, sustainability is a core issue that requires attention. From interaction with the Community Relation Head, it shows that the company gives serious consideration to sustainability and this has the potential to promote harmony between NEDCo and stakeholders in the energy sector including businesses and households.

4.2 Challenges in Implementing Internal Control Measures

Implementing quality control measures is an expensive process that comes with costs of diligent operations that require attention to drive organisations to achieve efficiency. Interview results revealed several challenges that confront NEDCo in the implementation of internal quality control measures. Some heads of Departments lamented over lack of commitment to work among staff as the major challenge militating against the quest to attain high-quality service. Some cited short-term nature of quality measures rolled out by management which they claimed only temporally addressed service quality issues confronting the company. Besides, heads of various managerial positions showed strong agreement to the fact that interference from political appointees impacted negatively on the capacity of the company to

effectively implement service quality measures. Indeed, the results of the interviews confirmed that political, religious, and other 'important' personalities have often stepped in to circumvent processes and procedures to favour themselves and their followers. This challenge became visible especially when some of these issues that bother on bribery and misappropriation of funds were discovered to constrain the delivery of services by NEDCo.

5. CONCLUSION AND THE WAY FORWARD

The present study has shown that from the lens of staff of NEDCo, the company has implemented some internal quality principles to improve quality service delivery. It is crucial to point out that, to some extent, the company emphasized short-term objectives in its attempts to remove operational bottlenecks and improve service quality. This was found to be a key challenge since it is difficult to improve service quality by implementing short-term measures that often are not anchored on key TQM principles. More so, interference from political appointees is a major constraint militating against successful implementation of quality service measures. It must be emphasised that, implementation of quality service requires commitment. It is therefore important for both management and staff to remain committed to the ideals of service quality by striving hard to improve customer service delivery. Attaining such a feat requires the introduction of motivation packages in the form of rewards and punishments so that both management and staff are made to develop a sense of belongingness which is an essential ingredient in enhancing productivity. Improved productivity will help to improve customer care and by extension customer satisfaction, which is a key target in quality management for utility organisations.

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