

Developing and Improving Quality Efficiency in the South African Energy Industry

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Abstract--Businesses today need to be more effective and efficient in order to design the best products and provide outstanding services to their customers. The purpose of this research is to develop and improve quality efficiency while sustaining continuous improvement at a South African Energy provider's Mpumalanga plant, which is one of the nine regions in South Africa.

Accomplishing quality efficiency is challenging, as customers expect quality of service at all times. In general an organisation's or a business's success depends on the reliability of delivering electricity. Therefore the South African Energy provider should be able and capable to deliver electricity at all times.

Current research results revealed that: (1) organisations need to do more to raise quality awareness and inform other employees about the quality unit, (2) organisations should go the extra mile in planning, monitoring and evaluating quality, (3) departmental quality objectives and goals should involve employees in formulating the goals and objectives, eliminating misunderstanding and mistakes committed by the workforce where quality is concerned, (4) management should be committed and involved in accomplishing quality efficiency in any capacity and making sure that continuous improvement is sustained, (5) commitment by management and employee recognition will improve capability, performance and innovation.

The research study accordingly has a realistic and methodological significance in terms of achieving and improving quality efficiency and sustaining continuous improvement in providing energy in South Africa.

I. INTRODUCTION

The supply of energy is of utmost importance to the economic success of South Africa. Recently Eskom is under enormous pressure to deliver energy to South Africa. This paper reports on a study carried out at Eskom to ensure the application of technology management in order to achieve quality efficiency, specifically in an energy providing organisation. Quality efficiency is the integrated key to the survival, sustainability and accomplishment of every company. There are numerous challenges that are faced by the South African Energy Provider specifically at Eskom which there are blackouts, loss of production, rain, Meduphi project and impacts of low grade coal. Energy efficiency improvement is therefore considered to one of the most powerful and cost effective way to promote sustainable development in South Africa through a collective realization of economic growth, cleaner environment, and social development [1; 2 and 3]

A strategy of high quality leads to a sustainable competitive advantage [4; 5]. Organisations find it difficult in sustaining quality improvements and continuous improvement. It is generally accepted that quality techniques

such as total quality management (TQM) can produce a sustainable competitive advantage and also providing sustainability [7]. Quality means diverse things to different people, however, quality efficiency is all about creating customer satisfaction which leads to an improved competitive advantage and sustainable continuous improvement [6]. The main objectives of this study are to:

1. Determine quality serviceability focusing on Quality Department at Eskom
2. The planning and controlling of quality at Eskom
3. Employees knowledge of quality objectives and goals at Eskom
4. SAEP commitment towards accomplishing quality efficiency and continuous improvement;
5. Eskom management engagement and commitment towards customer's satisfaction with the services provided.

II. RESEARCH METHODOLOGY

The aim of this study is to identify which methods can be utilised to improve sustainable quality efficiency at Eskom. The research method utilised in the study is both qualitative and quantitative in nature. Primary data was collected by using structured questionnaires, surveys, short interviews and observations sheet to accomplish the aim. The questionnaire was developed and structured based on an extensive literature review to answer research objectives and were utilised as a main component of collecting data from participants or respondents within Electricity Generation Unit (EGU) of the organisation.

The research questionnaires consisted of five main questions subdivided in ten sub-questions of each. The main research questions focused on the following factors impacting on quality efficiency at ESKOM - (i) quality assurance, (ii) quality audits, (iii) quality objectives, (iv) commitment towards quality, (v) quality efficiency and continuous improvement, (vi) customers satisfaction, and (vii) utilisation of quality strategies.

The questionnaire then was disseminated to 100 participants within EGU. Furthermore fifteen participants were interviewed, telephonically and via email.

Background of participants (Managers, Engineers, Artisans, Technicians, Supervisors, and Operators, Buyers and Draughtsman) is significant because it provided valid information which impacts the study. The variety of participants and their respective designated positions or job titles provided a non-biased perceptive to the study. Figure 1 displays the participants "job titles" whilst Figure 2 displays their educational background and Figure 3 their work experience.

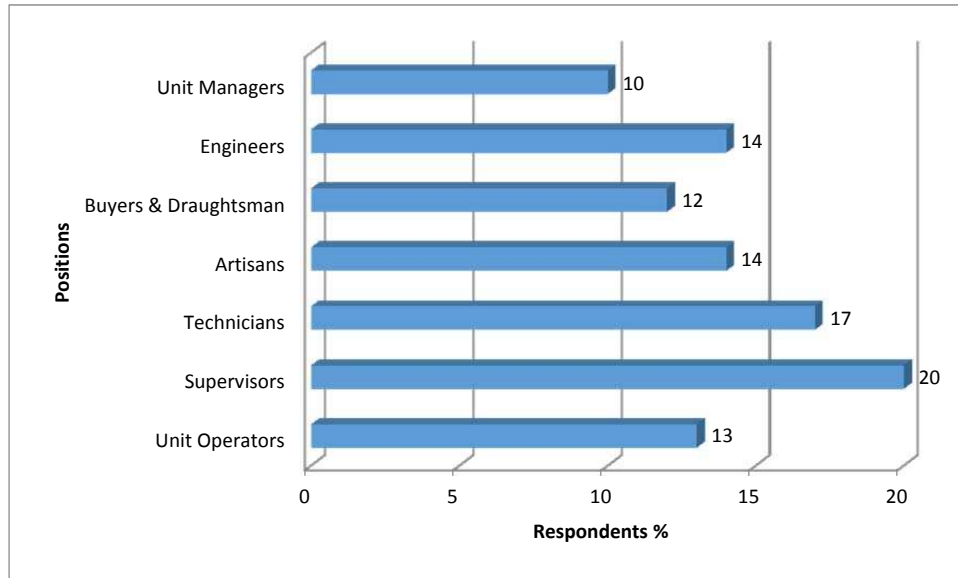


Figure 1: Position or Job Title Analysis

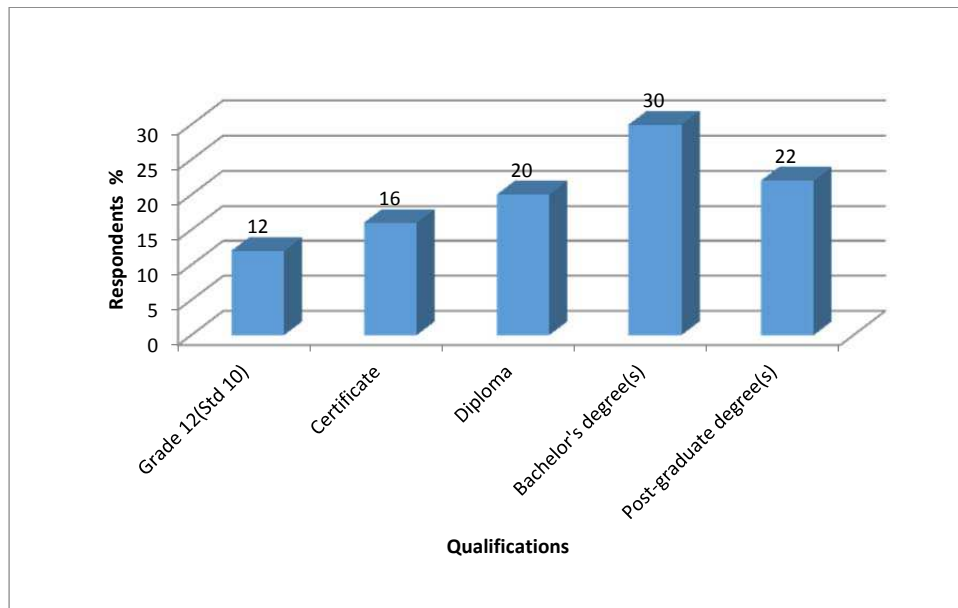


Figure 2: Respondents education level.

Figure 1 represent the importance of job title, 24% is made of unit managers and engineers which this roles requires participants who have detailed understanding and knowledge. 76% is made up of Operators, supervisors, technicians, artisans and buyers, and draughtsman. The results clearly show that all this position requires each other in order to build successful organisation like Eskom.

Figure 2 above demonstrates that there are respondents with bachelor degree (30%) in their field of study, followed by respondents who have post-graduate degree (22%), followed by diplomas (20%) and certificates (16%) holders with grade 12 (12%) as minority. The results show that 52%

of well trained and educated respondents collectively make decisions that influence the success of the organisation in achieving organisational goals and objectives and their aggressive targets.

Figure 3 clearly indicates that participants who have four, five, and six or more years working experience (63%) provided valuable information to this study. 37% of respondents have a less working experience (one to three years working experience). 63% indicate that Eskom have experienced staff which have acquired knowledge to a gain understanding, and skills to improve their individual performance to provide quality effort.

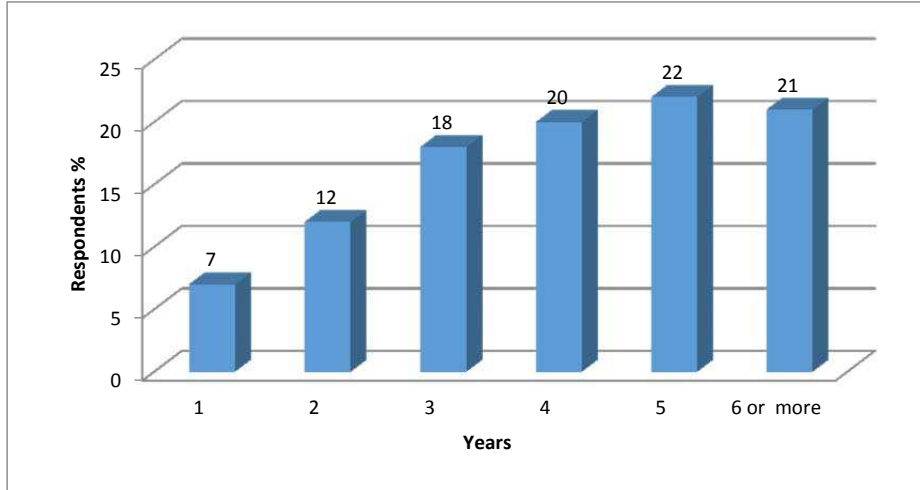


Figure 3: Respondents years of experience at the firm.

This section has provided valuable information of respondents which helped the researcher to complete the study. Respondents provided valid and important information about their backgrounds (Education, Work experience and job title) which positively impacted this study.

III. RESULTS

A. Quality

The management of quality is one of the core competency required in any organisation. Managers and organisations should proactively take note that quality is a competitive benefit and has to remain a characteristic of business services and products. It can best be described as the degree to which a product or service profitably performs the intended purpose of the customer during practice. Quality efficiency is not an added value but it is an imperative fundamental prerequisite

and focus on conformance to specifications, fitness to use, value for price paid, and support services. [6; 8]

B. Research Objective 1

Quality Efficiency

The advantage of improving quality efficiency is to facilitate organisations in decreasing reworks and scrap, reducing production costs, increasing quality and efficiency, improving employee self-confidence, fewer burnout and absentees, and enhancing awareness and enthusiasm to improve work, and lastly increases competitiveness [36; 37 and 38].

Of importance is that Eskom have an effective quality department. Research objective 1: therefore focus on establishing if Eskom indeed have an effective quality department, see below figure 4.

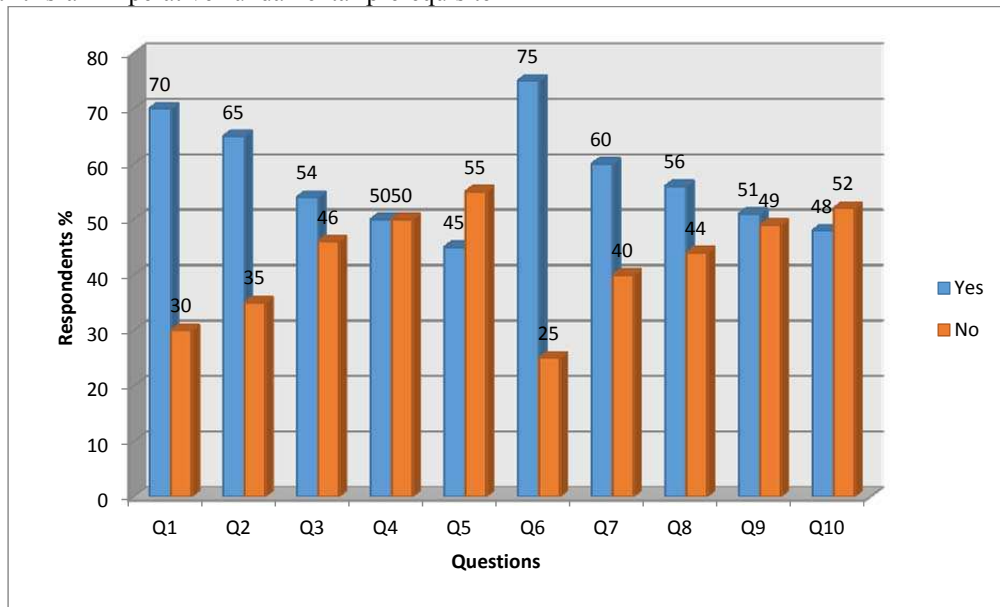


Figure 4: RQ 1: Does Eskom have an effective quality department?

The most essential questions range from 60% to 75%. The most important question is perceived to be Q6 (Does this organisation make every effort for zero defects?) while Q1 (Is there a quality department in this unit?), Q2 (Is management committed to attaining quality efficiency?) and Q7 (The department use quality tools to improve their processes?) are perceived to be the least significant. The results clearly show that 30% of respondents were not sure if there is quality department in this EGU. It is clear that employees agree that the use of quality circles are not fully used and practised in Eskom. It is the responsibility of every organisation quality department to make sure that their workforce are trained and equipped on quality concepts like quality circles.

C. Research Objective 2

1. Planning and control

Quality culture is required in order to ensure proper planning and control in an organisation like Eskom. Quality culture in terms of Eskom can be defined as a configuration of human customs, values, beliefs and behaviour distressing quality [11]. According to [15], states that quality culture is an organisational culture which subsidizes to the improvement of effective and efficient attention for quality. Eskom have instituted an expressive and operational approach which is called quality culture. Eskom management believes that quality culture begins with leadership that comprehends and be certain of the consequences of the structure opinion and recognizes the importance of attending customers in order to be successful.

An effective quality culture assists with holding organisations together and recognizing the culture that facilitates the firms to implement a quality strategy which inspires employees to embrace and make it a success [9] [15]. It can therefore be concluded that the quality culture within Eskom actually plays a critical part in how the personnel will observe quality.

2. The function of Quality Assurance

According to [7], Quality assurance in Eskom is defined as prevention based system which improves product and service quality, and increases production by placing the importance on product, service and process design. Quality Assurance is defined as some efficient method for guarantying quality throughout the succeeding stages in building up a service or product [11; 12]. Everyone within Eskom is responsible for quality so Eskom require a system that guarantees that the entire methods that have been premeditated and intended are pursued. Eskom quality assurance department has let them to achieve sustainable quality efficiency by expressing organisational efforts towards planning and putting a stop to difficulties from taking place at the source.

Quality assurance department in Eskom is responsible for developing, establishing and implementing written procedures to monitor or achieve below quality assurance activities. Eskom quality assurance activities include: [9; 11; 12 and 16]

- Failure mode and effects analysis (FMEA);
- Concurrent engineering;
- Experimental design;
- Process improvement;
- Design team formation and management;
- Off-line experimentation;
- Reliability/durability product testing.

These quality assurance activities are very important in terms of assisting, improving and achieving sustainable quality efficiency in an organisation.

3. Quality Audits in Eskom

A quality audit in Eskom can be defined as a self-governing review conducted to associate some feature of quality performance with a standard for that performance [11]. It is a methodical assessment of a demonstrative example of the drawing and undertakings implication on a whole quality system. Eskom is using quality audit to assess their current quality performance, agents, supplier's performance, and licensees.

Eskom quality audits have the following benefits which help organisations to improve quality efficiency and enhance continual improvement [9; 12; 17 and 18]:

- Compels continuous improvement;
- Confirm compliance;
- Accesses efficiency and training;
- Supplies contribution into executive decisions;
- Demonstrate management support of the quality program;
- Allows management to identify possible troubles or problems.

Figure 5 below clearly illustrates that 48% (Q1: Is quality planned, monitored and evaluated across the organisation's departments?) of respondents were not sure if quality of the products was planned and controlled, but knew that it was monitored and evaluated. This suggests that 75% of respondents understand the implication of producing products of poor quality or rendering poor services to customers [25]. From the results effective quality planning, monitoring and evaluating leads to customer's satisfaction, increasing of business growth and decreasing of the cost of poor quality [26]. This is evidence that respondents understand the implication of producing products of poor quality or rendering poor services to customers [7].

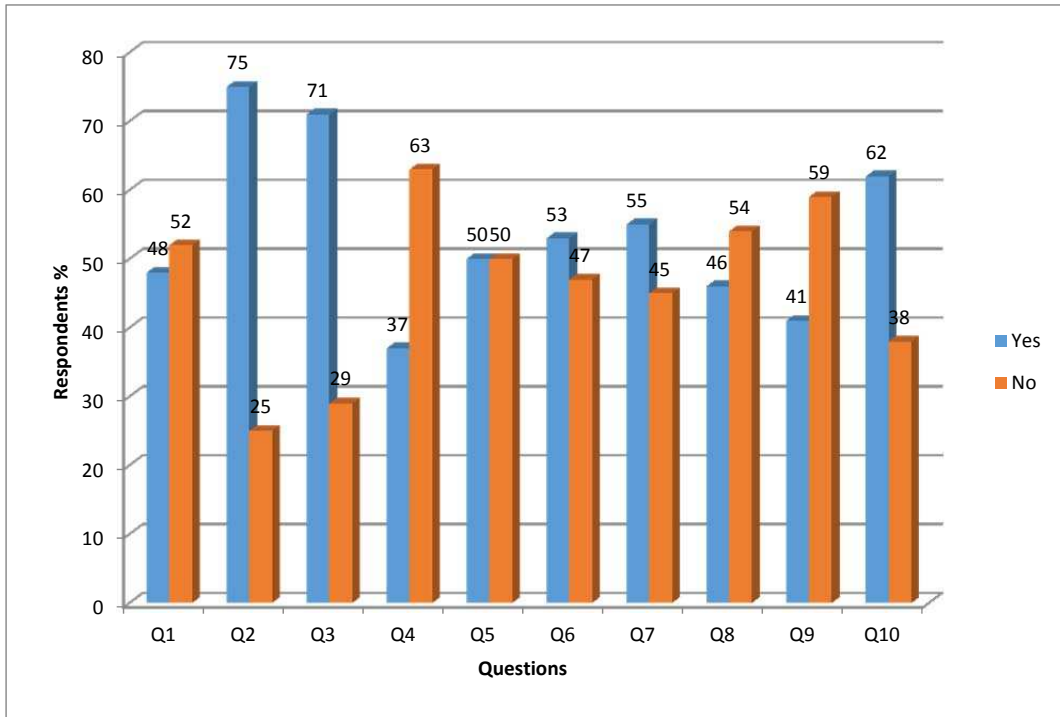


Figure 5: RQ 2: Is quality planned and controlled in this organisation?

D. Research Objective 3

The findings relating to respondents knowing and understanding departmental quality objectives and goals show that, (Q1: Are quality goals and objectives clearly defined?) is achieved 68%. The result clearly indicates that

68% of respondents agree that quality goals and objectives are clearly defined and understood by the workforce. Participants clearly understood quality values, goals, objectives and its impact on the overall performance and success of the organisation, see Figure 6 below.

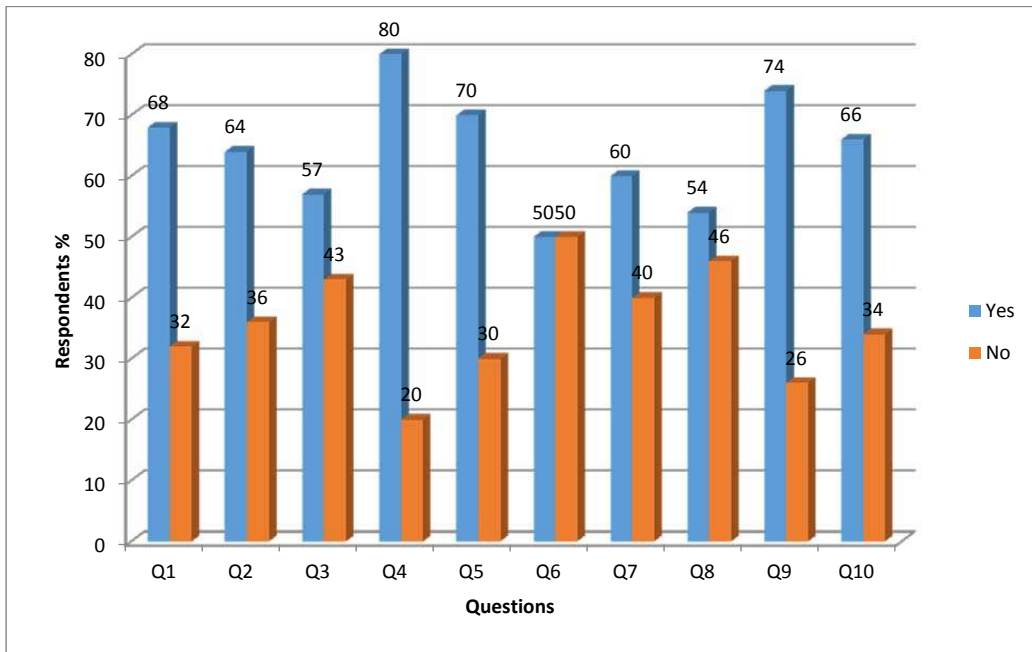


Figure 6: RQ 3: Do employees know quality objectives of the organisation?

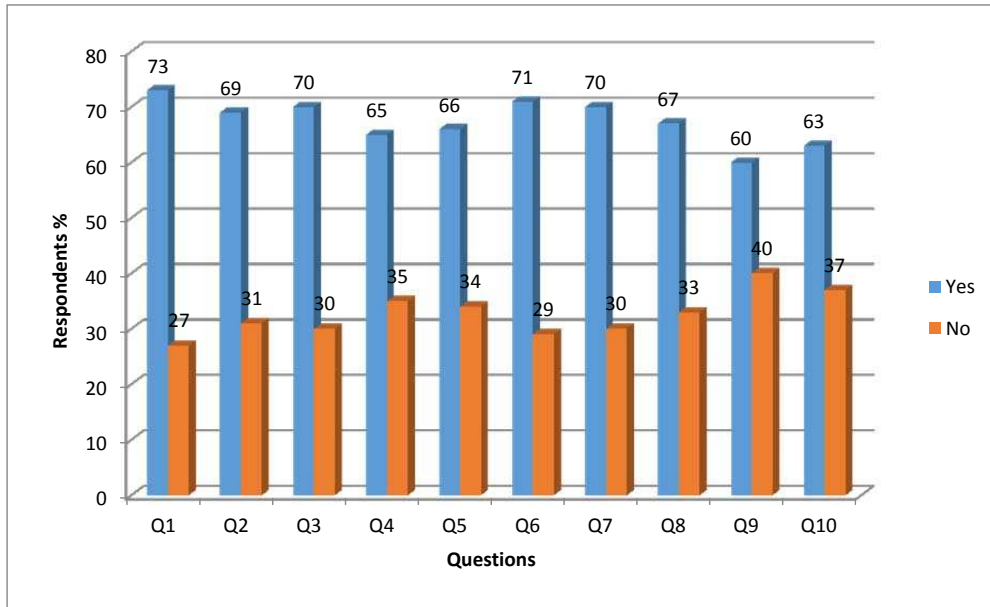


Figure 7: RQ 4: Is Eskom committed towards accomplishing quality efficiency and continuous improvement?

E. Research Objective 4

Figure 7 illustrates that 73% (Q1: Are leaders committed to quality efficiency and continuous improvement (CI) sustainability?) of respondents are sure that Eskom management and quality leaders are committed to attain quality efficiency and continually improve sustainability. This clearly indicates that participants have good understanding of quality efficiency and continuous improvement. The results show that Eskom management is committed and more involved in achieving quality efficiency in any capacity and making sure that process continuous improvement is sustained [14]. The unit should have new strategic continuous improvement techniques in place in

order to improve employee’s skills, empower them to work independently [17; 19].

F. Research Objective 5

According to figure 8, the results clearly indicates that 81% of respondents agree that Eskom management involves customers in the designing process of their products. From Figure 8 employees are aware and know what is expected of them in terms of meeting and exceeding customers’ expectations. Customers are very imperative for the sustainability of the business. Result clearly shows that Eskom have made it their mission to satisfy customers in every capacity and they are practising the theory of customers are always right and first.

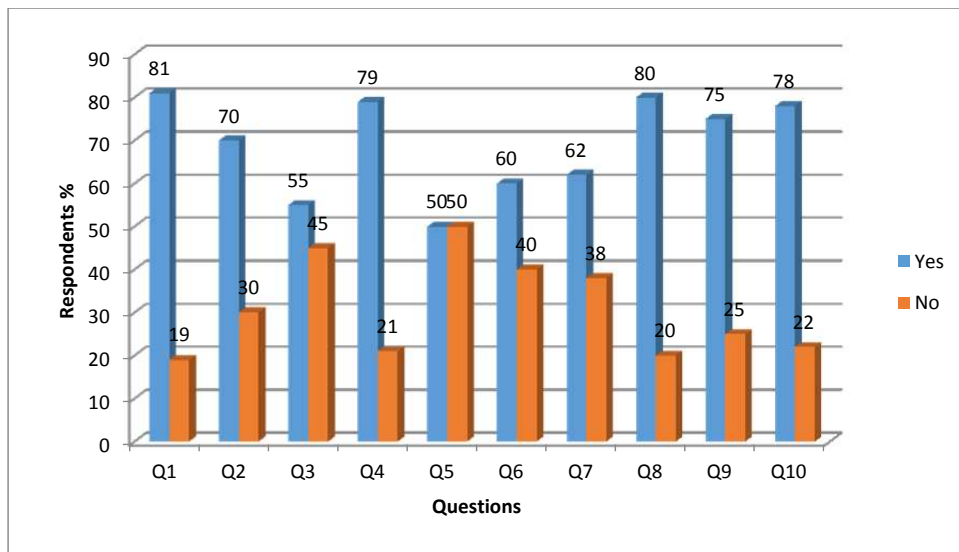


Figure 8: RQ5: Does Eskom management ensure that the customers are satisfied with the services provided?

G. The Utilisation Of Quality Strategies

Total Quality Management (TQM) is a philosophy that outlines three principles (Customer satisfaction, Employee involvement and Continuous improvement) for accomplishing high levels of quality and process performance [8]. A complete application, utilization and implementation of TQM improve and increase productivity and quality efficiency in business companies [18; 20]. Its main objective is to do the right things, right the first time, and every time. Businesses that have achieved the advantages of TQM have establish an effective quality culture [19; 21].

H. Impact of quality on customer satisfaction

According to quality gurus, quality should be described by the customers. High quality is a factor that indicates and improves customer satisfaction. Customers are attracted to quality in general because organisations that produce products of poor quality fails to satisfy customer expectations.

It is the responsibility of Eskom management to create, build and maintain good relationship with the consumers. If the consumers are satisfied and happy it means that the organisation is providing a higher service or product quality. In today's competitive marketplace where organisations contest for consumers or customers, quality is seen as a fundamental differentiator.

IV. CONCLUSIONS & RECOMMENDATIONS

It is imperative for organisations to effectively perform quality planning, monitoring and evaluating which leads to customer's satisfaction, increasing of business growth and decreasing of the cost of poor quality. In achieving quality efficiency and sustaining continuous improvement the relationship between managers, employees and customers is very important to the success of the business. The results clearly show that quality goals and objectives are clearly defined and understood. Customer focus, training and education have positive impact on quality efficiency innovation. Organisations should be able to provide necessary training which improves employees' morale and skills.

Organisations should formulate effective quality awareness structure that meets everyone's expectation. Organisations should strive to maintain and improve quality efficiency. Quality review meetings should be instituted because will help the organisation identify how far they are with achieving sustainable quality efficiency.

Future research will enhance this study utilising more rigorous research methodology in order to implement a sustainable quality efficiency framework to accomplish an improved performance system at ESKOM.

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