

The Impact of the Introduction of ISO 9001 Standards – Case of a South African Power Station Refurbishment Project

**Sambil Charles Mukwakungu, Matimba Davis Mabasa, Tebogo Lucky Mamela, Semanga
Mabuza and Sihle Mankazana**

Department of Quality and Operations Management
University of Johannesburg
Johannesburg, South Africa

sambilm@uj.ac.za, matimbabox@gmail.com, ltmamela@gmail.com, smanga9604@gmail.com,
sihlemankazana@gmail.com

Abstract

The ISO standards provide a mechanism for organizations that desire to persistently address their clients' issues through their items and services and constantly improve in quality. This paper looks at how the profundity of ISO 9001 execution impacts organization performance over the long haul. The study was conducted to determine the ISO standards on project quality deliverables, to determine its relationship with regard to employees' quality of work in a project. This study investigates two main questions; (1) Can ISO standards influence the end product or services? (2) Can the introduction of the standards affect how employees think with regards to quality? This research follows a mixed approach, which is a combination of both the qualitative and quantitative approach. Data collection techniques used include a random choice of research members from the examination populace in a fair-minded way, the institutionalized poll or intercession they get, and statistical strategies used to break down the information. The results indicate that the employees in Company X believe that an introduction will significantly enhance execution. It is suggested that associations ought to receive ISO standards in their daily practices, which will gradually increase the job effectiveness of the employees in the organization.

Keywords

ISO Standards, ISO certification, Quality Management System (QMS)

1. Introduction

Quality affirmation has turned out to be normal practice in numerous organizations which predominantly implement the ISO 9000 standards, which are often integrated Quality Management System (QMS) (Galetto, et al, 2015). An increasing number of studies examined the crucial keys of implementing an international certification, in particular significant of ISO 9000 in different scales (Miller, et al, 2017). The focus however has been mainly on the process of integrating different aspect including the design and implementation the strategy of the organization (Bernardo, et al, 2016). The ISO standards provides mechanism for organizations that desire to continuously meet their clients' needs through their items and administrations and constantly improve in quality (Basir and Davies, 2016). Due to the fact that certification necessitates scrutiny of the third party, it also improves the relationship with the supplier and enable the organization to secure resources (Miller, et al, 2017).

The main objectives for implementing ISO in organizations are: (1) to develop and sustain the ability to meet customer demand, (2) to increase competitive advantage, (3) to meet government regulations and (4) to develop the ability to reduce operational costs, amongst others (Bernardo, et al, 2016). However, Basir and Davies (2016) state that there are serious concerns in the implementation of ISO standards, such as high cost linked to training, the transformation journey not being properly received by organization members, and the reduction of effectiveness and efficiency over time. Researchers around have attempted to discover a connection between ISO accreditation and business execution, attaining disputatious outcomes (Bernardo, et al, 2016).

Furthermore, ISO certified organizations did not necessarily improve but instead deteriorated in terms of their business performance. This can include in some cases the costs associated with the implementation and maintenance of the standards which might exceed the benefits of acquiring the standards itself, and in other cases, organizations only apply the standards for commercial reasons and end up misleading auditors (Basir and Davies, 2016).

1.1 Background, Rationale and Scope of the Study

ISO certified organizations meet and acknowledges that their QMS fulfils standards necessities (Bernardo, et al, 2016). However, implementing ISO standards cannot assure that an organization will improve performance (Basir and Davies, 2016). Galetto et al. (2015) state that the improvement of the organization's performance is still questionable. Miller et al. (2017) argue that adopting ISO standards affords an organization to design, manufacture and distribute products and services in accordance to the customer's specifications, and more organizations, mostly in developing countries, have accepted the standards as their daily practice and find that it smoothens the supply chain. This brings us to the question of the importance of the ISO standards and what significant changes can it bring to the employee's engagement and employees' performance.

The primary competitive edge, nowadays, shifts from essentially applying the ISO 9001 standard to effectively actualizing a viable quality administration framework or QMS in the wake of getting the accreditation (Lee et al, 2009). In the event that organizations need to accomplish business advantages and unrivaled outcomes, the fulfillment of a quality statement to ISO 9001 ought not be the end, but rather the beginning stage for conveying an affecting QMS in the journey for quality change (Dick et al, 2002). Along these lines, given the conflicting idea of the exploration discoveries with respect to the effective usage and commitment of ISO 9001 to organization and budgetary execution, more actuality based and factual situated investigations in the zone of ISO 9001 QMS are required (Jang and Lin, 2008). Looking at how the profundity of ISO 9001 usage impacts organization execution over the long haul (Yaya et al, 2011). Particularly feature the requirement for advance logical research for the effect of ISO 9001 on operational and business execution in a few administration sub-divisions (To et al, 2011).

Although perceived as a powerhouse of African economy, South Africa is facing tremendous energy challenges. This is evidenced through blackouts, unplanned outages, energy tariffs being high, energy shortages, many years of low investment in power infrastructure and poor supply of energy in households that are characterized as low income (Bruno et al., 2015). Eskom is the state-owned entity mandated with the supply of power in South Africa. Figure 1 below depicts the map of power plants in the Republic of South Africa.

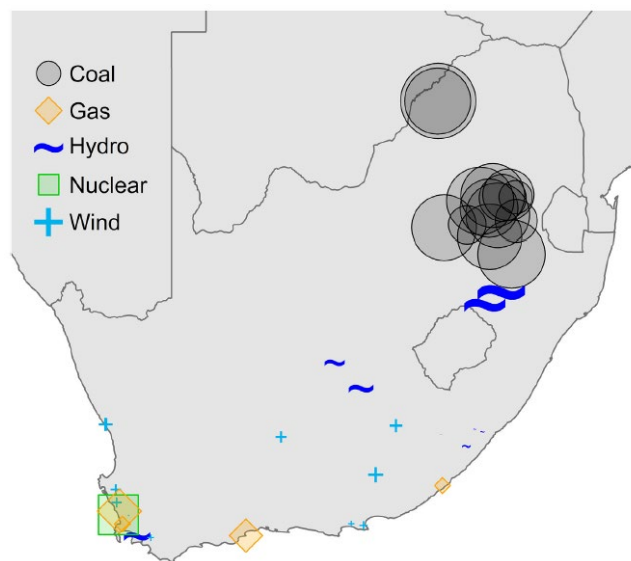


Figure 1. Map of Power Plants in the Republic of South Africa (500MW shown in the legend) (Pollet et al., 2015)

1.2 Value, Aims and Objectives of the Study.

The aim of the study is to examine the impact of the introduction of the ISO standards on quality improvement in a power station refurbishment project. The study was conducted to determine the ISO standards on project quality deliverables, in order to determine its relation with regard to employee's quality of work during the refurbishment project.

Furthermore, to aid the purpose of this study, the following questions were asked: (1) Can ISO standards influence the end product or services? (2) Can the introduction of the standards affect how employees think with regards to quality? With the goals to characterize and subjectively measure ISO 9001 practicality as the achievement of the standards' targets and decides its effect on the execution measurements of organizations identified with item/benefit quality, operational and money related execution.

The study intends to contribute to the body of knowledge related to QMS effective implementation in construction projects, and in power station refurbishment in particular.

2. Literature Review

2.1 ISO Standards

Since the introduction of ISO 9000 standards over three decades ago as a key tool to enable the establishment of internationalization of businesses and the requirement for administration framework principles (Fronseca, 2015). The standards are widely used by various organizations, and most crucially used to increase both operational and market benefits, (Manders, 2015). However, the ISO standards fall short for matching Total Quality Management objectives and principles (Fronseca, 2015). de Vries, (2015) argues that by stating that the implementation of the ISO standards is very important, regardless of the type of industry the organization is in, and further affirms that in excess of one million associations in 187 nations around the world have implemented ISO 9001 standards and more than 80% of them have had positive results and increase in the value of their respective organizations.

Traditionally, it is assumed that standards are only applicable for technical industries, and it has become apparent in the last decade that it is not the case (Blind, 2017). A notable example would be unceasing furthermore, uninterrupted power supply/stream in the mechanical offices, guaranteed conceivable through thorough and quick worked checking, supervision and control frameworks, which execute rectify activity, capacity of appropriate frameworks and close down of electrical framework somewhat to ensure against by and large crumple if vital (Kucuk, 2016). Certification of ISO 9001 bring about potential innovation of service organizations and small firms, such as innovations (Giovanni, 2014)

ISO standards certified organizations have certain levels of excellence in a competitive sense, individual uniqueness, and consistency. Therefore, many firms have taken the initiative of obtaining quality certification for sustaining competitive advantage and improve their financial performance (Selvi, 2017). Application of ISO standards in service facilities don't necessarily guarantee success and positive outcomes, some researchers argue that there are obstacles that organizations face prior to application of ISO standards, which include bureaucracy: lack of guidance by top management, and high demands and inactive reaction from employees (Spakianaki, 2018). African based organizations lack the capacity to meet international standards and this enable them to effectively implement the ISO standards (Jamal, 2015).

2.2 Quality Management Systems

The usage of the quality administration framework (or QMS) is a critical point of reference for any organization. Feasible advancement of the organization and its aggressiveness are specifically reliant on the correct working of the QMS. Accreditation of Quality Management System as indicated by ISO 9001 can keep up a long confiding in association with purchasers. Execution of the quality administration framework (QMS) will help convey the

organization to another level, since the QMS is intended to constantly enhance the exercises of organizations (Georgiev and Georgiev, 2015). Execution of the quality administration framework incorporates steps, for example, arrangement of the framework, which requires clear organizing and designation forms usage; affirmation – select the accreditation expert; Maintenance of the framework in working condition (Lukichev and omanovich 2016). The organization's administration choice on usage of QMS ought to be made, in any case, in the wake of thinking about the accompanying issues:

- The reason for the execution of the QMS;
- Deadlines for the introduction of the structure;
- What assets can be distributed to making frameworks and staff preparing;
- Which accreditation framework to pick which association to contract for the affirmation of QMS.

The primary goals of confirmation are: (1) to surpass client desires; (2) to limit the danger of foreswearing of customer items or its arrival; (3) to enhance the intensity of items; (4) to upgrade the distinction of the association; (5) to enhance inner administration (Lukichev and omanovich 2016).

2.3 ISO Certification

ISO 9001 standard places a solid accentuation on distinguishing proof of customer necessities and fuse data from them during the time spent on product design. Taking note of that enhancing the quality of the item is the consequence of better correspondence and customer service, selection of respondents can be viewed as attentive and vouching for the learning of essential rules of ISO 9001 (Zimon 2015). It should be focused on that the execution of the requirements of ISO 9001 decidedly influences reducing the risk of making a thing that does not meet gotten by the association quality necessities. Consistence with the necessities of ISO 9001 reduces the risk of producing a product not in accordance with customer requirements or standards adopted by the organization. Consistence with the necessities of ISO 9001 in the production and monitoring of the production process has a significant impact on increasing the technical quality of the product (Zimon, and Malindžák, 2014). Breaking down the negative side of usage of the prerequisites of ISO 9001, it is noticed that the high expenses of affirmation and support of the framework unquestionably assumes a main part. The cost of actualizing the framework will include: (1) expenses of consultancy counseling, (2) affirmation assessment, (3) accreditation review and (4) the charge for issuing the endorsement (Georgiev and Georgiev, 2015).

3. Methodology

This research uses a mixed approach, which is a combination of both the quantitative and qualitative approach, based on an exploratory sequential design. The research design framework is depicted in Figure 2 below:

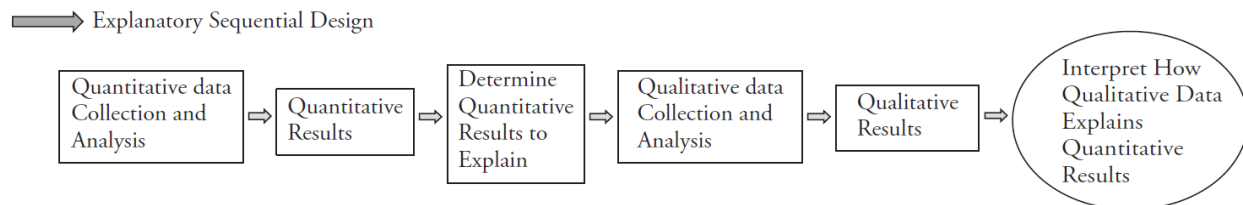


Figure 2. Research Design Followed in This Study (Creswell, 2015)

Following the research design, collection and analysis of quantitative data was performed first, then the results were recorded. The results of the quantitative approach were used as pointers to compile the interview questions. This is followed by the collection and analysis of qualitative data, results of which are used to explain the quantitative findings (Creswell, 2015).

A questionnaire was used to gather sufficient information to determine the possible outcomes. A quantitative statistical and data collection techniques used include a random choice of research members from the investigation populace in an unprejudiced way, the institutionalized survey or mediation they get, and statistical techniques used to dissect and test foreordained theory in regard to the connection between particular factors.

Information gathering strategies incorporated into leading one on one meetings with population sample and conveying poll to the Company X Station together with their Section managers and Heads of Departments. Data was collected by requesting participants to answer a questionnaire. 19 out of a possible 58 refurbishment project employees were selected to complete the questionnaire. They were required to answer the following questions: (1) Do you believe that the introduction of ISO 9001 has led to improved quality of end products at Company X refurbishment project? And (2) Do you believe that the introduction of ISO 9001 has led to a mindset change of employees regarding quality at Company X refurbishment project? The questionnaire forms the basis of a subsequent study discussed in the conclusion and recommendations section of this paper.

4. Results and Discussions

This section presents the data collected using the research tool. The data is presented and discussed with regards to the participants perceptions of ISO 9001 introduction in Company X refurbishment project. The first sub-section presents the results of the survey, while the second sub-section reports on the findings from the interviews.

4.1 Survey Results

As part of the survey, study participants were requested to answer two fundamental questions related to ISO implementation at Company X during the refurbishment project of a power plant.

Question 1 – Do you believe that the introduction of ISO 9001 has led to improved quality of end products at Company X refurbishment project? Figure 3 below depicts the percentage responses of all the respondents with regard to Question 1, and it shows that 68% of the participants believe that the introduction of ISO 9001 in their work place has led to improved quality of the end products, while 32% of the participants do not believe that the introduction of the ISO 9001 standards in their work place will improve quality of the end product.

Question 2 - Do you believe that the introduction of ISO 9001 has led to a mindset change of employees regarding quality at Company X refurbishment project? Figure 4 below shows the percentage responses of all the respondents with regards to Question 2, and it shows that 53% of the participants believe that the introduction of ISO 9001 in their work place has led to a mind shift of employees regarding quality at Company X refurbishment project, while 47% of the participants do not believe a mindset change of employees regarding quality at Company X refurbishment project has taken place.

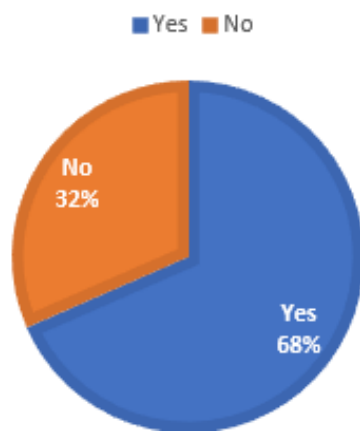


Figure 3. Percentage Responses to Question 1

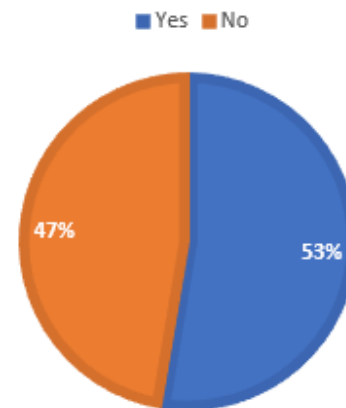


Figure 4. Percentage Responses to Question 2

4.2 Findings from the Interviews

The participants were randomly selected through a cross section of the department's concerned i.e. mechanical, C&I, commissioning, quality and safety, engineering and electrical. In addition, the jobs vary from senior management, managers, technicians and senior technicians, safety and quality officers to make the sample as accurate as possible.

From the interviews conducted it has been found that ISO 9001 has been implemented in Company X for over three years. Based on the results obtained from interviews carried out, majority of the employees working on the refurbishment project at Company X believes that the introduction of ISO 9001 has led to improved quality of end products which confirms the findings of Question 1 from the survey. However, a small group of participants indicated that company still experienced deviations from project's targets. These deviations were mostly due to the fact that some employees were still not familiar with the ISO standard, although it has been implemented for three years.

Findings from the interviews also indicated that the introduction of ISO 9001 did not lead to the expected mindset change of employees regarding quality at Company X refurbishment project. This perception is demonstrated by the very even YES/NO 47%/53% response rate to Question 2 of the survey. The setting at Company X refurbishment project is a microcosm of Eskom as a whole but also can be seen as a SMME or small business in the service industry with (+/- 60 employees). However, there has been concerns that the expected mindset change could not be achieved due to a lack of quality champion to drive the ISO 9001 introduction within Company X.

5. Conclusion, Recommendations and the Way Forward

The results indicate that the employees in Company X believe that the introduction of ISO 9001 will significantly improve performance. However, this introduction should be supported by management commitment as some employees, although not opposed to change, might find it difficult to align themselves with the new standards. Shafiq, et al, (2014) state that the ISO certification position organisations for higher levels of performance. Hence the ISO certification have been endorsed internationally for years (Wu and Jang, 2013).

There are recommended standards to different organisations that can expand the credibility of any organisation and assist in increasing the productivity of the organisation (Shafiq, et al, 2014). Ratnasingam, et al (2013) and Miller, et al, (2017) affirms that ISO certification have a positive influence in the organisational processes and the competency of management. It is recommended that organisations should adopt ISO standards in their daily practices, which will gradually increase the job effectiveness of the employees in the organisation (Basir and Davies, 2016). Additionally, it is recommended that Company X involves an employee whose primary task would be to champion the implementation of the ISO standard.

This study sets the foundation for further research that may consider reviewing the state of affairs of ISO standard implementation in SMMEs to provide a clear view of the extent of ISO 9001 adoption in the industry. Further research may also consider looking into the factors that may prevent or advance the adoption of ISO standards within the power plant refurbishment companies.

Acknowledgements

The research team would like to show its appreciation to the Department of Quality and Operations Management at the Faculty of Engineering and the Built Environment of the University of Johannesburg for furnishing us without breaking a sweat culmination of this examination venture.

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Biographies

Sambil C. Mukwakungu is an award-winning academic who has been lecturing Operations Management to first year students, Food Production, and Quality Management at the University of Johannesburg since 2009. His passion for teaching and learning has allowed him to make a difference in at least one student's life every year. He is a young researcher who is still establishing himself in knowledge creation with keen interest in Service Operations Management, Lean Operations, Continuous Improvement, as well as business innovation and innovation in Higher Education. He was awarded Best Track Paper Awards at the 2016 IEOM Conference in Rabat, Morocco, also at the 2018 2nd European Conference in Paris, France, and he is together with his team from the IEOM UJ Student Chapter a recipient of the 2018 IEOM Outstanding Student Chapter Gold Award for exceptional chapter activities and contributions to the field of industrial engineering and operations management.

Matimba Davis Mabasa is a BTech student in Management Services at the University of Johannesburg, has completed short learning programme in Basics in Project Management, Basics in Total Quality Management, Strategic Management and programme in Sales and Marketing with the University of South Africa. A participant of Development Evaluation Training Programme in Africa (DEPTA) hosted by Wits School of Governance – Clear Anglophone Africa. Have two published papers for at IEOM and GBATA 20th Anniversary Annual International Conference 2018, and have two more papers accepted for publication at the IEOM International Conference 2018, Pretoria, South Africa. Whose future prospects is to further do MBA, Master's in Project Management and Operations Management.

Tebogo Lucky Mamela is an award winning young leader who is the Founder and Chairperson of the Quality, Operations & Management Services (QOMS) Forum. He is enrolled for a BTech in Quality Management at the University of Johannesburg, completed his National Diploma in Management Services and a short course Enterprise Resource Planning (SAP). In view of exceptional academic excellence, he is a recipient of the 2017 and 2018 UJenius Club Award among the Top 1% of academic achievers at the University of Johannesburg. In recognition of exceptional academic achievement, he was awarded the Dean's Honors Roll - 2017 for outstanding academic excellence in 2016 by the Faculty of Engineering and the Built Environment. He successfully participated in the 2018 GEPS research program which involved students from the University of Pittsburgh (USA) and University of Johannesburg (SA) which was to investigate how engineering development can create social change.

Semanga Mabuza, is an academically excelling student which became apparent at an early age when he was awarded a bursary as the best learner in high school back in 2014 at Kensington Secondary School, he was later recognized as first year top achiever in 2015. His academic excellence continued to prevail as he was recognized with UJenius Club Award both in 2016 and 2018 becoming part of the top achieving 1% of the University of Johannesburg. He was also recognized as top achieving student in the Faculty of Engineering and Built Environment at University of Johannesburg both in 2016 and 2017. Later in 2017, he was also recognised as best student in the country (South Africa) in Management Services by the South African Management Services Institute.

Sihle Mankazana is a currently pursuing her Baccalaureus Technologiae in Operations Management, in the Quality and Operations Management Department at the University of Johannesburg. She was awarded her National Diploma with Cum Laude in Operations Management (2017) from the University of Johannesburg. She has been part of the UJenius Club that recognizes the top achieving 1% of the University of Johannesburg in 2014, 2015 and 2016. She was awarded the Dean's Honors Roll - 2017 for outstanding academic excellence in 2016 by the Faculty of Engineering and the Built Environment. She is also a tutor at the University of Johannesburg with great passion for teaching and learning, and an interest in research. She has two published papers at the GBATA 20th Anniversary Annual International Conference 2018, Bangkok, Thailand, and four more papers accepted for publication at the IEOM International Conference 2018, Pretoria, South Africa.