Improved Productivity and Customer Satisfaction in Manufacturing through a Sustainable Quality System

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***Abstract*--This work is based on a case study of a manufacturing company in Johannesburg, South Africa. The paper presents a set of findings based on an investigation into Quality Management System (QMS) implementation at a company located in the Northern part of Johannesburg. The paper discusses challenges experienced in QMS implementation, successes achieved, failures, and propose recommendations on how to improve QMS implementation and maintain a sustainable management system. Observations, unstructured interviews and structured questionnaires were used. Triangulation was concluded on 20% of respondents using unstructured interviews. Questionnaires were distributed to 114 respondents divided into three segments, namely; customers, Top Management and employees. 62% responses were received back properly completed. The results revealed that the customers involved in the study preferred to do business with companies where QMS has been implemented. The responses from Management showed that QMS implementation is of importance to them and is an empowerment tool to their employees.**

I. INTRODUCTION

In this study, Quality Management System (QMS) is defined as a formalized way in which procedures, responsibilities, processes and structures needed to achieve an effective quality management documentation. An effective QMS does not make an organization more efficient or profitable, but it can provide the organization with the ability to do its work better, from sales to production. Current dynamics in the world recognizes that businesses should produce or provide consistent quality products or services. To meet these requirements more and more businesses are developing, implementing and maintaining appropriate quality systems. The increasing demand by corporates for quality systems is aimed mainly at ensuring that businesses remain competitive in the global arena. Globalization and technological advancement has introduced flexibility and variations in products and services, resulting in increased competition in the global markets, were customers choose goods and services from suppliers with reputable standards for quality and customer satisfaction. Companies should therefore now focus on developing innovative strategies which will help them gain competitive edge in their respective markets.

According to Stanleigh [12], there are numerous quality initiatives today which organizations are implementing. These initiatives include but are not limited to: Six Sigma, Lean Manufacturing, Quality Awards, Process Management, Reengineering, ISO Implementation/Re-certification and Quality shared Service. The ISO 9001 Quality Management System implementation is by far the most popular of any quality initiatives globally, with thousands of companies certified and the standard adopted as national standard by over 100 countries [3].

An ISO survey released in 2014 shows that an estimated 1, 138, 155 certificates have been issued for the ISO 9001 standard, [16]. Making it by far the world's most popular management system. The survey further shows that China holds the highest number of ISO 9001 certifications at about 350, 000. South Africa as a developing economy has an estimated 3,800 ISO 9001 certificates the highest in Africa, [17].

The study is particularly aimed at small to medium enterprises in developing economies such as South Africa, with the intention to stimulate the development and implementation of sustainable Quality Management Systems which will readily meet customer and regulatory requirements. This would consequently contribute to the development of the country's economy.

Given that Quality Management Systems are by far the most popular of all quality initiatives, most businesses therefore, consistently try to establishment quality systems that can lead to certifications to standards such as ISO 9001, or product and sector specific standards such as SABS product mark scheme, ISO/TS 16949, ISO/TS 29001 etc. However, it is common knowledge that some companies only work towards getting a certification from certification bodies and thereafter fail to maintain the system in order to ensure its efficiency and effectiveness. This view is shared by Imler, [4] who commented that at times Management is not willing to take a long, hard, honest, and sometimes painfully revealing introspective look at the organization. This therefore leads to the collapse of the quality systems. From the above we can establish that one of the key components for an effective quality system is to have full commitment and involvement of Top Management. Oakland [11] clarifies that the framework for total organizational excellence starts with the vision, mission, goals, strategies which are all set by Top Management. It is clear that in order to achieve quality excellence; leadership commitment from Top Management must be strengthened through clear strategies which must be communicated throughout the organization.

Another equally important component of maintaining a sustainable quality system is the continuous improvement

process, which assesses the systems effectiveness by using continuous quality improvement methods and tools such as the PDCA model, cause and effect analysis and statistical process control to analyze the system inefficiencies, non-conformance, effectiveness of corrective and preventive actions, customer feedback, warranty reports, internal audit report etc.

This case study is based on a South African manufacturing company which was established and maintains a sustainable Quality Management System to enhance organizational productivity and customer satisfaction. The company is currently in the certification process for the South African Bureau of standards, [SABS]. Product Certification Scheme, and as such the effectiveness of its Quality Management System will be very important. The SABS Product Mark, which is essentially voluntary in nature, is largely based on the ISO Guide 65, and is aimed at providing third party guarantee of quality, safety and reliability of products to the consumer. The Mark Scheme provides general rules for third party certification system of determining conformity with product standards through initial testing and assessment of the manufacture's Quality Management System. The above may be followed by an onsite inspection, which takes into account the manufacture's Quality Management System and the testing of samples from the manufacturer factory, [16].

A. Objectives and Scope of the Case Study

Evidence from the preliminary customer survey revealed that most customers show an increasing preference to do business with companies which have quality systems. Based on this, the Top Management therefore decided to carry out the Quality Management System implementation project with the following objectives in mind:

- To determine the degree of meeting customer demand and expectations through a sustainable quality system.
- To document and formalize all operating procedures in order to enhance productivity.
- To identify challenges in the implementation of quality systems.
- To continually review the Quality Management System to ensure effectiveness and sustainability.

The above objectives were only applied to the manufacturing plant in Johannesburg. All the relevant levels within the organization were involved in the QMS implementation project, including management, process heads, shift supervisors, mechanics, punchers as well as administrative personnel. The project mainly focused on determining and establishing documented procedures, work instructions, workflow processes (were necessary) and all other necessary aspects for the QMS. Data was collected using questionnaires and interviews were conducted with process heads, operators etc., and direct observations made at selected workstations.

II. LITERATURE REVIEW

In this study, both primary and secondary data was utilised. The following databases were used: Access Engineering, Emerald, EBSCO host-business source complete and Engineering Village.

QMS implementation is a process of improving quality and organisational performance [1].

The system does not make the organisation but contributes to its effectiveness. Organisations can improve quality, if the will for change is welcomed by all people in the company. There are several strategies available to guide the implementation of QMS implementation, but since not all organisations are the same the process of implementation needs to be adjusted to fit the specific needs and context of the organisation. QMS implementation should also take into account business culture, hierarchy, goals and objectives etc. Maguad [9] explains that QMS implementation should be adapted to the specific requirements of the organization because there is no model that provides a solution which fits every business enterprise.

Pressure from globalisation has made manufacturing organisations to move towards three major competitive areas, namely: quality, cost and responsiveness [10]. The norm in QMS implementation is for an organization to clearly define reasons for establishing a QMS beforehand. This is meant to minimize resistance and ensure all stakeholders understand the organizations strategic objective. Organizations implement quality systems for different reason, some see it as a tool for improving internal processes and product quality, whereas others view it as a strategy to gain competitive edge over competitors. Nevertheless, the primary focus of quality management is to meet customer and regulatory requirements and strive for customer satisfaction through structured, systematic processes. This is a very important factor which organizations implementing QMS should be mindful of. To support the latter statement, a study conducted in Gujarat, India to determine quality practices in manufacturing industries revealed that majority of respondents replied that 100% of their customers are insisting on QMS certification [5]. This therefore provides further prove on how markets react to customer specifications or requirements.

Having said this, it must be highlighted that businesses should avoid implementing quality systems and getting certification solely for public relation purposes. Doing so only leads to system ineffectiveness and the company incurring more costs. White [13] echoed that implementing a Quality Management System just to please customers is not desirable. The implementation of a QMS should be a strategic decision taken by Top Management, taking into consideration their customer and regulatory needs, their own positioning in the market versus their intended successes. Without the active participation of Top Management, the proper functioning of the QMS could collapse as employees are not likely to take the QMS procedures seriously. Developing a solid quality culture is therefore important and continuous efforts must be made through training and

awareness programs for all stakeholders (i.e. employees, vendors, suppliers) to understand their role in ensuring the organization achieves its quality objectives. Once the quality culture is fully entrenched, the QMS should live up to the saying that "quality is about doing the right thing even when no one is looking"

Literature on Quality Management System shows that barriers of QMS implementation are common within most organisations across the globe. Karaszewski [6], in his survey stated that limitations to QMS are linked to specific organisational sector and specifies the following as the main categories which hinder implementation. These are, namely:

- Cultural limitations: are mainly not generic but are dependent on the region in which Quality Management Systems is being implemented. [6].
- Insufficient management preparations: the ISO: 9001 international standard advocates for full involvement and participation of Top Management in the implementation of Quality Management System. Top Management should display great attitudes in leading the entire organisation towards achieving a specified quality objective. Therefore the lack of suitable leadership and preparation of management may be a barrier limiting new concepts or even making it impossible to implement them [6].
- Insufficient employee preparation*:* the insufficiency of employee preparation is due to the lack of Top Management showing a positive attitude towards the implementation of QMS. According to Karaszewski [6], the level of reluctance by employees to adjust and accept new methods of work differ from one region to the other.
- Employee attitudes*:* The willingness to receive knowledge and apply is dependent on the employee's mindsets and attitudes. For example in Japan quality initiatives are seen as one of the most effective instruments for teams to solve problems. Management encourages employee participation and often meets after work to discuss process improvement activities [6].
- Legal regulations: Karaszewski [6], states that difficulties in the field of QMS implementation across the world is also caused by legal regulations. [6], further explains that in his research the results show that the scale of the challenge is determined more by the type of the regulation than the place. This therefore means that different regions or countries have different regulations and therefore the QMS implementation can be hampered as a result of these regulations.

A. Challenges and Problems

Implementation of QMS projects is complicated, as it requires methodical and thorough planning. This is from collecting information from process owners, workers, and business partner's right through to obtaining customer feedback on product quality and service. Given that the business (in the case) had what can only characterized as "undocumented quality system" which includes some protocols, records of certain procedures and various practices carried out but not formally documented. This therefore led to the quality system being established and implemented and thus a range of areas to be improved to ensure optimum productivity and absolute customer satisfaction. In order to achieve this, various items/elements had to be changed. For example, in the case of machinery and production equipment new parts had to be purchased to ensure that all manufacturing machines meet the technical specifications for the SANS 882:2015 envelope standard, therefore all worn-out blades and knives had to be changed which improved the productivity and efficiency of the machines. Moreover, all measuring equipment which had previously not been calibrated had to be calibrated to ensure consistency of outputs and compliance to requirements. Mindful of the above, a force-field analysis model depicted in fig.1 below was used and the following were identified as possible forces "for change" and "against change" for this QMS implementation project:

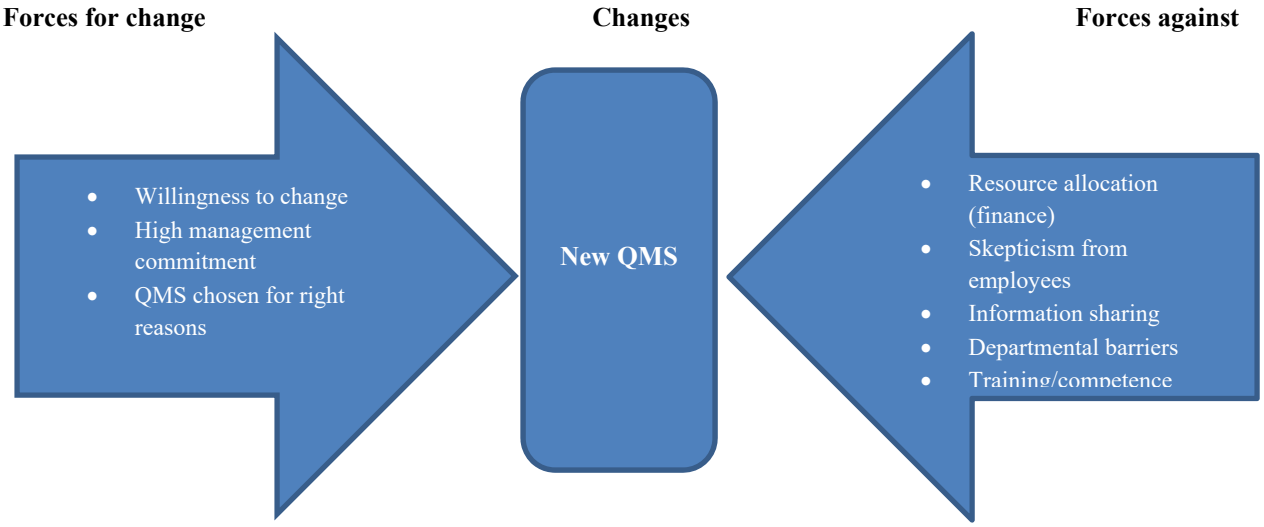

Figure 1: Force-Field Model Summary of the Analysis from the Case Organization

Figure 1 above explains the force field analysis for the case study. The forces for change represents factor within the company which were in favor of the QMS implementation. The factors identified were: the willingness for change and commitment from Top Management; the QMS implementation was chosen for the right reasons. The factors which identified to be hindering QMS implementation project were: inadequate financial planning and resource allocation; the time allocated for the project; Skepticism from some employees and competence/skills levels.

III. CUSTOMER SATISFACTION, PRODUCTIVITY AND QUALITY MANAGEMENT

A. Customer Satisfaction

In the global markets arena it is common knowledge that customer's form a baseline for any organization because a satisfied customer is the best advertising tool for any organization which wants to get and maintain a competitive edge. In order to achieve customer satisfaction it is important that a business enterprise should understand customer requirements, and implement the necessary processes and strategies aimed at meeting or exceeding customer requirements. Such strategies may include maintaining good contact with the customer by creating personal, product, support systems and general contact [2]. Table 1 below represents a descriptive analysis on how the level of expectation heavily influences the customer's behavior in varying situations of satisfaction [2].

From the above table it is clear that at a low expectation level it is relatively easy to satisfy a customer. However we can also see that if the customers are not satisfied, they can easily move from their current supplier to another in pursuit of satisfaction. A different scenario though is shown for customers with a medium expectation level, because they don't vigorously voice out their dissatisfaction. Lastly customers with high expectation and fulfillment, result in high loyalty [2].

B. Productivity and Quality Management

As highlighted already in a few sections of this paper, many business enterprises are continuously seeking strategies to simultaneously improve their productivity and quality. This is essential because the global markets are increasingly becoming competitive and organizations need to strive to survive and succeed given the related global economic pressures.

Organizations that investment in a good quality system, which does not only serve as a set of documented processes will see the tangible gains through improved productivity and customer loyalty. This view is shared by Kontoghiorghes [7], who examined the relationship between productivity and quality in a service organization and suggest that investment in quality should indeed result in productivity gains. This assertion was also advocated by long standing quality gurus. To this end, we now know that the more effective the quality system, the more costs will decrease as a result of less rework, minimal mistakes etc., this will in turn lead to greater levels of productivity and profitability. The above assertion is shared by Kontoghiorghes [8], who argues that organizational emphasis on continuous improvement of processes and quality will ultimately result in more cost-effective production, which in turn improves both productivity and profitability.

Mindful of the above contemporary opinion, it is clear that continuous empirical investigations in different spheres should be done to determine if or not a relationship between the two methodologies exist or if the existence of the relationship is only in specific domains. Because of time constraints such a practical exercise couldn't be explored and thus necessitate future research interest in this area to test the hypothesis.

IV. METHODOLOGY

The data collection process followed a structured approach. A pre-study survey was done by way of informal interviews with various stakeholders and direct observations of organizational processes were also done to get an in-depth insight of the case organization. After this preliminary assessment the various research questionnaires were refined.

A qualitative research was employed for this study in order to extensively understand the subject at hand. In the case, three different questionnaires were developed for: Top Management, customers and general workforce in order to understand the varying opinions from the three identified stakeholders of the business. The questionnaires were distributed to the following stakeholders:

- Customers
- Top Management (board of directors)
- Employees (including process owners)

TABLE 1: CONSUMER BEHAVIOR

SATISFACTION / EXPECTATION	LOW	MEDIUM	HIGH
LOW	INEVITABLE SWITCH OF SUPPLIER	MODERATED LOYALTY	SURPRISE
MEDIUM	UNEXPECTED SWITCH OF SUPPLIER	USELESS COMPLAINTS	MODERATED LOYALTY
HIGH	DISSATISFACTION WITH USEFUL COMPLAINTS	DISSATISFACTION CAN BE TOLERATED	DEEP LOYALTY

TABLE 2: QUESTIONNAIRES DISTRIBUTED TO EACH STAKEHOLDER CATEGORY.

Distributed to:	Questionnaires distributed	Questionnaires returned
Customers	30	21
Top Management	4	4
Employees	80	46
Total	**114**	**71**

The customer satisfaction survey included different types of customers (i.e. long standing customers, average buying customers and one time buying customers). This was to evaluate if there would be any common requirements for the different types of customers. In addition to questionnaires, informal discussions were held with a handful of suppliers to ascertain if they understood the strategic direction of the organization. The questionnaires distributed to the different stakeholders consisted of the following type of questions depending on the target respondents:

- Rating scale questions
- Close-ended dichotomous questions
- Open-ended question – intended to get true opinions, feelings and insights of the respondents.

In all the questionnaires, specific attention was drawn to Quality Management Systems through the type of questions asked. This was done to assess the respondent's views on whether or not the implementation of quality systems can aid in the improvement of productivity and customer satisfaction respectively.

A. Empirical findings, analysis and discussions

The findings and discussions are for three different questionnaires distributed to customers, employees and management of the case organization. The results are for an investigation conducted on the implementation of sustainable quality system for a manufacturing company based in Johannesburg, South Africa. Each questionnaire and interview response is representative of individual respondent, department and management position. However to ensure and promote protection of all concerned, and further encourage honest responding to interviews and questionnaires all responses were kept anonymous. Even though the experiential findings have been shortened in some areas, to create a more inclusive and centralized transcription, it is reflective of the true opinions of the respondents. The text written in italics represents the actual answers and remarks from the respondents.

B. Analysis and discussions

Below is data of the three different questionnaires distributed per stakeholder. The each questionnaire category is divided into two, namely respondents and non-respondents. Table 5.2, 5.3 and 5.4 below provides an analysis of the questionnaires distributed per stakeholder category.

TABLE 3: ANALYSIS OF QUESTIONNAIRES DISTRIBUTED TO CUSTOMER

Respondents and Non-respondents	Questionnaires	Percentage (%)
Respondents	23	77
Non-respondents	7	23
Sum of all participants (including non-participants)	**30**	**100**

The qualitative analysis for customer's questionnaires involved responses to seven rating scale questions, four open-ended questions and two close-ended questions. In addition to the questionnaires, informal interviews were held with participating customers to further probe and confirm their opinions.

The rating-scale questions asked respondents to rate the case organization in respect of seven identified areas (responsiveness, professionalism, product quality, delivery, competitiveness, quality and their overall assessment of the organization). The scale was determined as follows:

1= Excellent
2= Good
3= Satisfactory
4= Poor
5= Very Poor

Responsiveness: How do you rate our responsiveness in dealing with you? From the twenty three respondents who returned the questionnaires, 60% felt that the case organization's ability to respond to their queries was satisfactory, whilst 15 % feel that the organizations responsiveness is poor and thus needs urgent improvement. It is also worth indicating that the composition of the 15 % of respondents who rated the organizations responsiveness as poor are a combination of both long standing customers and once off buyers. A common remark made by the participants is that the sales personnel should be given more training on customer service and product knowledge.

Product quality: How do you rate our products and services, do they meet your needs and expectations in terms of quality? 70 % of the respondents rated the organisations products and service as "good". Notably good remarks were given particularly for the paper quality used in the envelopes, with one respondent saying:

> *"The paper used for the envelopes is of good quality, hence the envelopes don't shrink or anything like that".*

A few other respondents though seem to have had encountered problems with the glue on the envelopes not sticking. One of the respondents said,

"*I had a problem with the glue of the envelopes not stick on the edges of the envelopes and raised this with the case organisation. The matter was investigated and the outcome was that the adhesive supplier used was not following the correct cooling time procedure for the glue hence it was not sticking on the paper after sometime*".

The above responses are representative of a much bigger population of customers, and therefore the points and feedback they provide is crucial as it enables the business enterprise to improve their product quality, services and associated processes. With the establishment of quality systems, procedures relating to supplier selection and verifications are developed and documented to ensure that all raw materials used in the manufacturing of the product meet set standards and parameters. Most importantly this procedure ensures that only approved suppliers are used all the time every time, and further documents continuous evaluation methods to ensure suppliers are compliant.

Quality: How do you rate our approach to quality management to ensure absolute customer satisfaction? 65% of the 23 respondents rated the organizations approach to quality as being "satisfactory", whilst 34% (approximately 8 respondents) ranked the organizations approach to quality as "poor". According to the respondents this is largely due to the fact that the case organization doesn't have a certified quality system. Most notably such remarks mainly came from long standing customers, from big corporates who are increasingly demanding their supplier enterprises to have some level of recognized Quality Management Systems.

Overall: How do you rate the case organisation? About 73% of the respondents rated the organisation as "good:" overall. An estimated 86% reaffirmed the urgency for a Quality Management System to be implemented by the case organization. This was further noted on the responses under section 2 of the customer satisfaction questionnaire in which 90% of the respondents indicated that their buying choice is influenced by the following:

- friends/family who have bought a specific product or received a service from a particular organisation,
- organisations ability to promptly deal with customer queries
- Good price and
- Assurance of high quality products every time

TABLE 4: ANALYSIS OF QUESTIONNAIRES DISTRIBUTED TO TOP MANAGEMENT

Respondents and Non-respondents	**Questionnaires**	**Percentage (%)**
Respondents	4	100
Non-respondents	0	0
Sum of all participants (including non-participants)	**4**	**100**

The Top Management questionnaire was distributed to four board members of the case organization. The questionnaire had both close ended and open ended questions. The questions asked were mainly centered on Quality Management System, the company's vision and mission etc.

In this category all the four questionnaires distributed were received from the respondents. This signaled commitment by the organizations Top Management to all the activities concerned with the establishment and implementation of the Quality Management System. From the responses on the questionnaire it is quite clear that members of the board are in unison about the QMS implementation project. The Top Management was not only committed to the project in word, but was actively involved in almost all the activities involved in the project. When asked about their absolute involvement, one member of Top Management said:

"*Some time ago we (the case organization) attempted to set up a quality system and even sourced services of a quality practitioner but nothing really came out of that exercise, as there was very minimal involvement and participation from Top Management and therefore the entire workforce was also not motivated to participate fully in the project*."

TABLE 5: ANALYSIS OF QUESTIONNAIRES DISTRIBUTED TO THE WORKFORCE

Respondents and Non-respondents	**Questionnaires**	**Percentage (%)**
Respondents	46	57.5
Non-respondents	34	42.5
Sum of all participants (including non-participants)	**80**	**100**

The employees form an integral part the organization and their involvement is critical particularly on change management matters. To this end, the organizations Top Management through the Technical Director took time to explain and share the organizations strategic vision and how each employee has a significant role to play in making sure the set vision is achieved.

In an attempt to get the most out of employee's participation, 80 questionnaires were asymmetrically distributed across all the departments. With departments such as Production getting more questionnaires due to the large staff composition, relative to the Sales and Procurement department which are much smaller.

The employee opinion questionnaire comprised of ten questions, eight of which were close ended, whilst two were open ended. From the 80 questionnaires distributed only 46 (about ≈58%) were returned. Figure 2 below presents a descriptive analysis for the close ended questions.

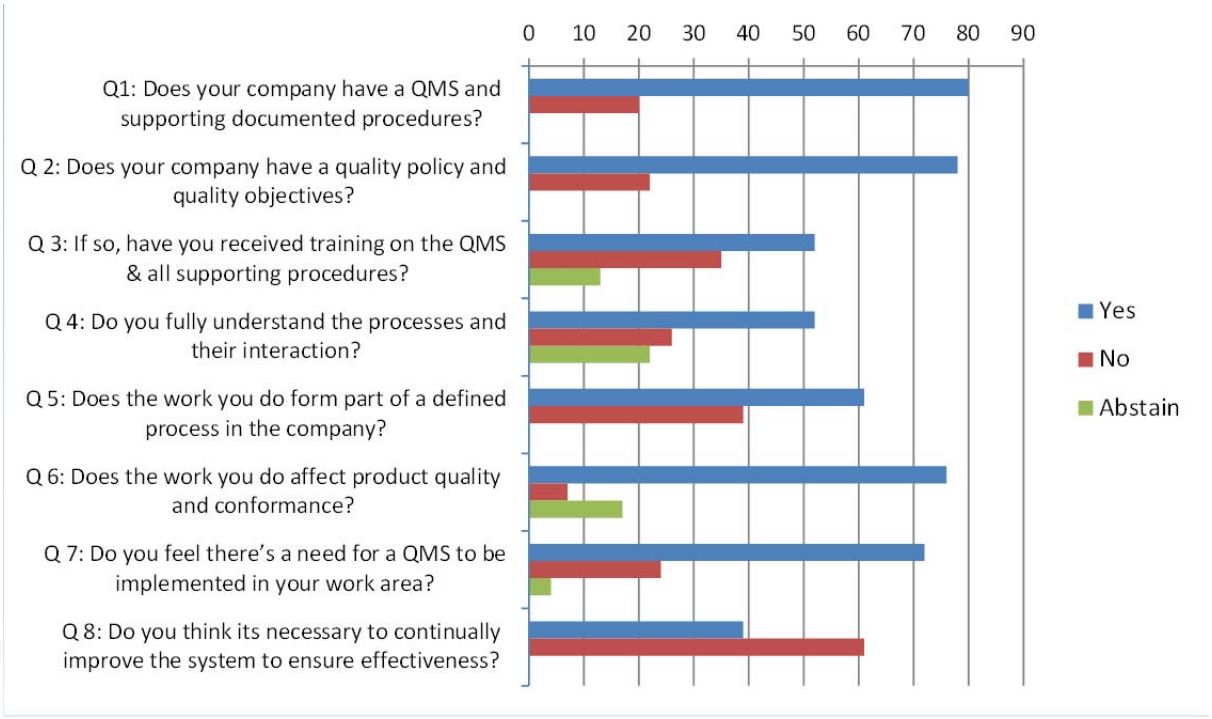

Figure 2: employee opinion questionnaire analysis

Question one of the employee opinion questionnaire asked respondents if they think their company has a Quality Management System – and about 80% of the respondents said yes whilst 20% said no. This question was intended to ascertain if the employees view the system as a QMS or not, and the feedback shows the overwhelming majority of employees are aware of the existence of the QMS within their company. With regards to question 2 approximately 78% of the respondents said yes their company has a Quality policy and Objectives statement. Although not included in figure 2 above, an open-ended question subsequent to question 2 asked respondents to state and list the Quality Policy/ Objectives. From this question only one respondent out of 46 respondents was able to specify the Quality policy and itemize the Quality Objectives. This is despite that about 52% of the respondents said they have received training on the QMS and its supporting procedures, which included the Quality Policy and Quality Objective Statement. It can therefore be concluded that more training and awareness programs need to be done to ensure all employees know and understand both the Quality Policy and Quality Objective Statement, and all aspects of the company QMS. Question six asked respondents if they think their work affects product quality or not, and 76% of the respondents said yes, whereas only 7% said no and 17% didn't answer the question. This question was intended to determine if respondents felt that they are part of the customer satisfaction process of the company, and the analysis shows that they feel as part of the process. Another interesting response was from question seven, in which 72% of the respondents responded positively to the implementation of a quality system in their work area. Lastly, 61% of the respondents said it important for the QMS to be continually reviewed to ensure its effectiveness.

C. Recommendations

Quality systems have been implemented by many business enterprises as strategy to enhance competitiveness. As the number of organizations seeking certification to national and international standards increases indications are that quality systems will continue to be a point of interest for many enterprises.

Mindful of the above, it is recommended that companies should continuously review their Quality Management Systems to ensure effectiveness and efficiency. This can be achieved by conducting internal audits to assess process and product conformity. The data obtained can then be used to improve the system as it will be empirical evidence of system performance.

D. Continual improvement of a Quality Management System

An effective QMS is one which is continually reviewed for efficiency. For this to be achieved, attention needs to be given to two fundamental things, namely:

- Customer inputs - through complaint analysis, opinion surveys, post-delivery analysis and regular contacts;
- Processes review – through assessment/measurement, monitoring and analysis of both process and product data. This will lead to factual decision making in management reviews, and thus provide a clear opportunity for sound corrective/preventive actions to be developed and implemented.

For a QMS to be sustainable it has to be improved through audits and reviews. Audits, particularly internal audits must always be a carried out at set intervals to ensure process compliance to documented procedures, whilst system reviews should be carried out periodically and systematically, to ensure the system achieves the required outcomes. Figure 3 below represents the Plan-Do-Check-Act (PDCA) model adapted from the ISO: 9001 international standard. PDCA model provides ideal tools for ensuring continual improvement of QMS.

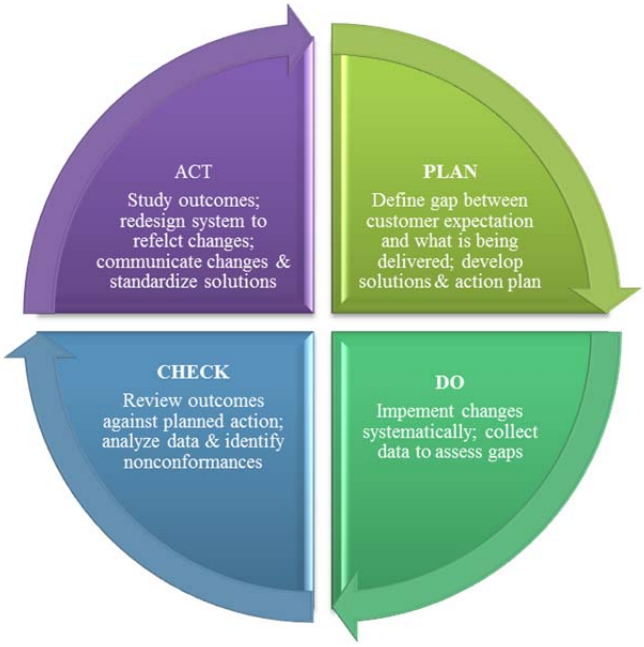

Figure 3: PDCA continuous improvement model

In the newly revised ISO 9001:2015 standard the PDCA cycle is closely linked with risk-based thinking and process approach. PDCA operates as a cycle of continual improvement, with risk-based thinking at each stage.

According to the International Organization for Standardization [14], combined practice of above mentioned concepts may provide the following benefits:

- Systematic management of planning, implementation, checks and improvement of processes and the management system as a whole
- Better usage of resources and increased accountability
- More consistent achievement of objectives and overall performance (productivity)
- Enhanced customer satisfaction by meeting customer requirements
- Enhanced confidence in the organization.

V. CONCLUSIONS

Findings from the study revealed that 80% of customer's preferred to do business with ISO 9001 certified companies. Triangulation revealed that customers had assurance of good business if the company is ISO certified. Moreover, although 76% of the respondents rated the organization's overall product and service as "good", an overwhelming 86% felt that the organization should now seek ISO 9001 certification in order to meet customer and regulatory requirements and compete in the market. The company's Top Management was seen supportive of the implementation of a sustainable Quality Management System. This will be a tool to empower employees in the company, determine and meet customer expectations through continuous improvement of the QMS. In general it may therefore be concluded that the implementation of a sustainable Quality Management Systems is an essential part of business improvement processes, and it is therefore recommend that further studies be conducted on the customization of the ISO 9001 implementation according to industrial requirements.

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