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Continuous Quality Improvement: A Case of Reman Centre, Johannesburg, South Africa

Flip Schutte[1], Sibusiso Masuku[2]

[1]Department of Marketing, Centurion Academy, Gauteng, South Africa
[2]Department of Management, Regenesys Business School, Gauteng, South Africa

Email address
pjwschutte@telkomsa.net (F. Schutte)

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Abstract
Continuous quality improvement (CQI) is a powerful tool used in the manufacturing environment. It has the potential to deliver results on both quality and productivity. CQI has performed well in many countries and companies, locally and internationally. This article investigates the impact which the introduction of continuous quality improvement can have on productivity in the Reman Centre. Reman is a strategic business unit of Komatsu South Africa. Currently Reman has a negative reputation for underperformance when compared to its third world counterparts internationally within the Komatsu family. This research article was undertaken to assist management towards understanding what steps need to be taken to resolve quality and productivity related challenges in the organisation.

1. Introduction

The Reman Centre is a strategic business unit (SBU) of Komatsu South Africa with their head office in Isando, Gauteng Province. Reman is the abbreviation for the remanufacturing department of Komatsu. This is the information centre and the heart of the entire Komatsu network, hence it needs to be on a continual reinvention mission. Reman has its own internal sub sections such as the dismantling section, assembly, electromechanical and the administration section. Together all the sections contribute towards delivering products to customers.

Komatsu Ltd is a multinational engineering company that has been founded in the year 1917 at the Ishikawa district in Japan. It specialises mainly in the manufacturing of mining and construction machinery, but its product rage also includes the manufacturing of motor vehicle bending machines such as presses and lasers. In South Africa, Komatsu is known for producing mining and construction earthmoving machines.

Komatsu Reman has the duty to provide to its branches, depots and customers an excellent service with regards to assembling components, improve and update on components, and rendering technical diagnostic services. Recently there is a trend that components from Reman Centre tend to fail on site. The turnaround time is highly questionable and the technical ability of staff is deteriorating. The quality issues have harmed the image of the company as machines continue to stand when new components fitted, fail prematurely. The branches and depots are seen as mediocre to customers due to their failure to produce quality products and on the other hand Reman is suffering high reputation risks at every level in the company.

The research that support this article investigated a number of factors which

contributed to poor quality output at the Reman Centre. All role players internally and externally participated towards the data collection process. The questions which this article wanted to answer are:

(1) What role will the implementation of continuous quality improvement have on quality in the Reman Centre?
(2) Is there a connection between continuous quality improvement and high product quality?

The article is exploratory and pragmatic in nature, meaning that it has a goal of explaining and understanding correlations or relationships between two variables namely:

(1) The impact of continuous improvement.
(2) Reman quality standards.

A stratified random sampling technique were used to draw samples which were permanent Reman employees. The sampling frame was consisting of managers, supervisors and foremen's, mechanics, unskilled labour force and suppliers. Forty people participated in the investigation.

2. Theoretical Background

The definition of quality improvement is complicated. It depends on the meaning of "quality". According to Kamonja, Liang, Sohail and Khan (2014) it is a word that has multidimensional aspects. It can refer to outcomes, property or processes. Continuous quality improvement is a concept that is multifaceted, very broad and diverse and it is based on future results (Solomon & Spross, 2011) where statistical interventions are used in the current period, so that challenges can be discovered now and resolved later (Mosby, 2009). CQI can be utilised in every sector of the economy and in every industry, for as long as it is carefully designed for the purpose it is meant for, and as long as it is well implemented (Edwards et al, 2008). It is also a key capability for developing and sustaining a competitive advantage (Oliver, 2012). Any progressive business that wants to maximize return on its resources has a good business reason to adopt CQI, not only as a onetime strategy but as a futuristic and continuous organisational strategy.

Continuous quality improvement is a systems approach that are inquisitive in nature. It is built, based on questions which ask how things can be done better, faster or cheaper. The success of the implementation of quality improvement depends on an organisation's ability to absorb and to apply conceptual changes and integrate these throughout the organisation (Oliver, 2012). CQI has the capacity and the capability to be used either to describe or improve a yet to be designed or existing service or product (Mostashari, Tripathi, & Kendall, 2009). The main focus of CQI is processes rather than individuals. It recognizes that people can make errors but when processes are followed, errors are removed from the processes and in that way, quality is improved and wastage is reduced (Winston, 2015).

The Japanese were the first to use the CQI philosophy in the industry as early as the 1950's. This concept was introduced to them by American consultants and its implementation improved the quality of Japanese goods dramatically (Radawski, 1999). CQI fits well within the Japanese culture because it promoted good Japanese values like trust, respect, good communication, collaboration, responsibility, empowerment, and recognition of seniority between employees and management (Radawski, 1999). CQI as a philosophy and its interventions are in line with other quality management philosophies such as the Lean Six-Sigma (LSS) and Just-In-Time (JIT) (Gul et al., 2012). Managers who thus wish to implement quality initiatives should study quality models, concepts, and tools (Pryor, Toombs, Anderson and White, 2010).

The successful implementation of CQI is based on long-term, companywide change management initiatives. Thorough implementation of CQI requires change from the organizational culture, processes, inter-organizational communication and substantial financial and emotional commitment of leaders and workers (Mc Laughlin & Kaluxyn, 1994). Through CQI, leaders are required to learn to share power; to learn from subordinates; be able to admit ignorance; know when to intervene; and learn on the job (Radawski, 1999). According to Radawski (1999), CQI requires that all participants need to have constructive inputs on organisational matters where all the employees jointly develop the true mission, vision and value statements of the company.

Attainment of high quality is a continuous journey which requires that processes be designed to suit the vision of the organisation. This then requires that the entire team approaches all work processes critically to ensure that the processes are fit for purpose (Flinchbaugh & Vasovski, 2004). This must be done to assess whether the system continuously improves operational accountability and operational efficiency (Ettorchi-Tardy, Levif & Michel, 2012).

Winston (2015) states that through the CQI concept, organisations have the opportunity to re-invent themselves all the time. He further notes that the desire to continuously innovate, end up becoming the culture of the organization. This is necessary because the CQI deals with operational processes which benefit the organisation with product or service efficiency, zero wastage and increased customer satisfaction. The level of high competition in the market and the battle for market dominance, requires that companies continue to improve their processes to be able to respond to the needs of their customers beyond the capability of their rivalries in the market.

CQI is implemented to see if the programs that are in place for quality support have the infrastructure that will produce the required quality. The management of the organisation through CQI initiatives has the ability to measure the result compared to initial projections. Conducting this philosophy will assist management to see problematic areas and respond by re-designing and/or re-developing new systems that provides CQI with better support (O'Neill & Palmer, 2004). It can be concluded, based on the above statement that CQI

has the mechanism to both identify and resolve issues which can result in quality issues.

CQI is closely related to Total Quality Management (TQM) and it is very difficult to use the one without the other due to the fact that both philosophies are customer focussed, processes oriented and require an organisational wide participation (Sallis, 2014). TQM as an approach originated from quality assurance methods (Gul, Jafery, Rafiq and Naeem, 2012). The aim of TQM is thus to increase the product quality to meet and to ensure that products and services exceed the expectations of the customer beyond the reach of competitors. Thus, the TQM process also requires the participation of management, workforce, suppliers and customers. TQM has three core elements namely meeting customers' expectations, continuous improvement of organisational processes, and using employee skills and knowledge (Oliver, 2012). CQI and TQM are proactive interventions that describe and design results before hand and have the ability to influence the underlying work processes and systems (Shortell, O'Brien, Carman, Foster, Hughes, Boerstler & O'Conner, 1995). As such, both interventions differ from traditional methodologies in the sense that traditional methods like quality assurance are reactionary and have its emphasis on correcting historical errors, whereas CQI and TQM are visionary and avoiding errors. CQI and TQM are best measured by employee evaluations in relation to quality improvement (Gul et al., 2012).

3. Researh Methodology

The mixed method (both qualitative and quantitative) has been used as research methodology for this article. This means that a questionnaire with both open and closed ended questions, as well as questions to collect pure statistics has been developed. Interviews were used to compliment the questionnaires. This was also done to strengthen the data collection and to confirm the validity, reliability and trustworthy aspects of the study. The entire research project was undertaken at Komatsu's Remanufacturing Department, known as the Reman Centre in the Johannesburg head office buildings, in South Africa. The population for the research was all Reman employees. The Reman Centre as a department consist of a total number of sixty-two employees. The number is made up of one general manager, three departmental managers, five supervisors, seven administrators, seven inspectors, twenty artisans, eight store people and eleven general workers. A representative sample of forty people were selected from the employees, considering their different roles in the company. The sample was compiled as follows: General Manager (1); Consultant (1); Departmental managers (3); Production foremen's (6); Administration department (4); Inspectors (4); Mechanics/ Artisans (13); Storemen (4); Semi-skilled employees (4). Forty questionnaires were thus distributed. The sample included all roles and levels of seniority in the company.

The limitations for the research project that were foreseen by the researcher were the following: No research study has ever been conducted in Komatsu before. This may make people to withhold some information because they doubt their protection and anonymity. Reserved comments may have a negative impact on the project. A large number of the semiskilled workers are illiterate or semi-literate. Their ability to read and write in English may pose a serious problem to them and interviews may for this reason be conducted in their mother tongue and translated into English. Translation may bring along minor language discrepancies.

4. Findings and Discussion

This section aims to discuss and present the data collected and the findings from the questionnaires and interviews. Important findings will also be interpreted and discussed. Thirty-one (31) respondents managed to complete and return the questionnaires.

4.1. Demographic Characteristics of the Sample

Reman Centre statistics show that Africans are dominating the department. Africans were 57% of the employees, followed by whites who were 32% and Coloureds and Indians were the least as they were only 11% of the participants. The gender indicator illustrated that 87% of the employees were male, while 13% female. 87% of the staff did complete high school. 61% of these employees were under thirty-five years of age and they were within their first five years of formal work.

4.2. Operational Knowledge

The first question was: "What is your general understanding of quality?" 57% of the employees had an understanding on how to define quality. 39% of the staff was unable to convincingly define quality and 4% of the staff did not provide answers. According to Pike (2008), there is no single universal definition of quality because quality can mean different things to different people, however, Pike admits that a general definition of quality should put emphasis on creating value for the end user or meeting and exceeding customer needs.

Question two asked: "Are you satisfied with your own quality input/output as an individual?" The answers received, revealed that 71% of the employees were satisfied with their output/ input but 29% were not satisfied. In an organization, such as the Reman Centre, issues such as quality and safety are communicated on a daily basis and they are supposed to be the key drivers. There is a positive correlation between quality and employees' satisfaction. Piriyathanalai and Muenjohn (2012) state that employees are ultimately responsible for ensuring good quality output in an organization because company strategies rely on people to convert them to reality. Without a thorough understanding of these fundamentals, it becomes impossible to create a successful product or business. From the available data one can conclude that 29% of Reman Centre employees are not

happy with their own quality. This has an impact on their output levels. Those who said "yes" on the question that they would like to improve their own product quality and those who said "no", share similar sentiments during the interview. They both mentioned the issue of training and job rotation so that they can have access to fresh knowledge and different work challenges so that they can be able to see and understand the bigger picture.

Taguma, Litjens and Makowiecki (2012), state that the professional development of employees has a positive contribution to, and effect on quality because the interaction between the environment and the employee integrates and creates an improved working environment, service quality, job satisfaction and high staff retention.

Question three asked: "How do you feel about the current Reman Centre quality output? "84% of the employees think that Reman Centre's output is average and not competitive in the market. 11% believes that it is the best, while 5% believes that it is good. It is very unfortunate that employees from one department can have such different views on quality. This is a sign that quality issues are not communicated adequately in the department and that quality is not standardised.

Total quality management (TQM) is one tool that can help all workers to share a common standard and view on quality issues (Sallis, 2014). Suarez (1992) warns that poor knowledge about quality and its lack of management are the main causes of organizational failures.

Only 29% employees indicated that the Reman Centre's products are competitive when measured against local competitors. 71% said that the products are not competitive. They proceeded to state that it is not competitive because the department does not have the required resources in terms of tooling and the latest work procedures. This lack of resources result in warranty claims against the company.

Question four asked: "As an individual, would you like to adapt to international quality standards?"

93% of Reman Centre employees were willing to adapt to international quality standards and only 2% were not willing to adapt. 89% of Reman Centre employees agree that adapting to international standards will have a positive impact on productivity. 7% think that productivity will decline if Reman chooses to adapt to international standards, and only 4% of the employees at the Reman Centre were unsure of what may happen to productivity if they adapt to international standards. 60% employees indicated that they are dedicated to producing high-quality products. 71% indicated that they were motivated to support a new quality initiative. This is an indication that the majority of employees understand that the world is a competitive global village.

Dahlman's (2006), view on globalization is that it allows companies to gain access to international standards of production. It introduces organizations to new technology which will reduce the cost of production while increasing the volume and the quality of goods per hour. Globalization helps organizations to improve their level of competitiveness.

On the question: "What do you think will happen to productivity if a new strategy can be introduced to drive quality?", 73% of the employees said that productivity will increase, against the 20% who said it will decrease. Both these groups made comments during the interviews. The 73% who said productivity will increase did mention that it will decline for a short while during the early implementation phase but gain momentum sharply afterwards and stabilize. The 20% said that productivity will decline for a long time due to change resistance dynamics and training required. However they said that once the mentioned issues have been addressed, productivity will accelerate.

On the question: "What do you think will be the result if a new quality system can be introduced? Will product quality increase or decrease?", 81% of the employees said that product quality will increase against the 13% who said it will decrease. 6% didn't answer the question.

4.3. Commitment, Quality and Working Conditions

100% of the employees know what they came to do at work. Wrzesniewski and Dutton (2001) state that it is crucial for employees to fully understand their roles so that they can make a meaningful contribution to the success of the company. Yet, 86% of the employees agree that they need someone to tell them when they are doing something wrong. A study of motivation accept that peers should assist on corrective behaviour before management have to intervene. Burton (2012) states that this phenomenon will help to build stronger work teams.

Poor quality is often a result of the lacking of fundamental tools to perform the task properly. Poor resource management contributes to 47% of total project failures. 79% of Reman Centre employees agree that they will work outside of the prescribed and expected processes when they don't have the correct resources to do the job. This is where quality issues are generated resulting into either a poor product or warranty claims. 61% of the employees understand that to improve quality is everyone's responsibility.

Reman Employees are 60% likely to withhold their ideas from management and the rest of their team members. Interdependence helps people to integrate from individuals to teams. Together they create an environment in which they can contribute far better than when they are only individuals completing a task. Through shared goals, open communication and shared team vision they can enrich an organisation (Tarricone, 2002).

78% of Reman Centre are vocal about quality improvement issues. Employees who have the freedom to voice their concerns freely tend to become high performers in comparison to employees who are quiet (Detert and Burris, 2016). In total 75% of Reman Centre staff agree to find new ways to perform their jobs if it can enhance quality outputs.

60% of the employees agree that they do have opportunities to learn new things at work. De Grip (2013) states that on the job learning is very crucial for human capital development. For organizations to remain competitive

in the market, it is essential that they ensure that their knowledge is up to date. Continuous learning enables employees to react to changes of any sort in the market, therefore making their organization competitive.

4.4. Quality Improvement

89% of Reman Centre employees agree that something needs to be done in order to improve quality standards. 60% of Reman Centre employees agree that processes should give guidance to solutions, but a large number of the neutral and the disagreeing employees create a strong perception that processes are not always followed.

Organizations should rely on processes as guiding documents and avoid responding on instincts (Horowitz, 1999). Processes allow careful understanding of the problem and as such thorough investigations about problems, provide lasting solutions. 82% of the staff agree that processes should be improved. Process improvement is all about making things more effective through utilising a system approach as a means of intervention, thereby increasing productivity. Processes are about finding better methods to perform the job better and more effective ways (Jeston & Nelis, 2014).

79% of the staff disagree that they retaliate back to the organization, however, a significant 21% does retaliate by deliberately sabotaging the company. These employees need to be positively engaged because their actions can affect the organization badly.

93% of Reman employees are eager for new information. They would like to learn new things at work.

71% of the total workforce agree to being encouraged. Properly engaged employees will find creative means of making their work much more effective. Management must encourage and reward such employees so that the trend can rub off on others and eventually become an organizational culture. 82% of the workers want learning to occur at work. Fuller (2003) states that there is a strong relationship between informal learning, economic performance and productivity. Fuller continues to say that even more learning happens at work than at schools. Things that are learned on the job are more empowering because of their practicality than things learned in the classroom.

4.5. Measuring Quality

Of Reman employees, 67% know how to measure their quality of work. 33% employees do not know. Performance management is linked to improving employee effectiveness in the workplace. According to Martinez (2001) this means that performance management needs to be utilized to ensure that employees understand what is expected from them individually on a daily basis, and how their performance contributes to the larger organizational success (Jeston et al., 2014). Employees should achieve the best results in what they do so that the company remains competitive.

79% of the department agrees that something needs to be done to address declining quality levels at Reman. 92% of the Reman staff understands the importance of studying the root cause of the problem. Root cause analysis is a first step towards solving a problem. It also prevents the problem from recurring in the system. It eliminates poor product performance and boosts product quality through total elimination of defects, thus improve quality (Handley, 2000).

96% of the department agree that when something is incorrect on the production line, people must raise the flag to have the problem resolve. 86% of the department understands that customer complaints in relation to poor quality are the problem of the employees not delivering their best. As such the employees, must take charge in resolving customer complaints and draw up processes that will eradicate problems from recurring in future. The entire department have to take a unified view on problem resolutions.

4.6. Taking Responsibility

96% of the department is prepared to come out and speak up when something is incorrect, so that the problem can be resolved. This is the kind of behaviour that needs to be encouraged across the production line, so that all products produced, can be of a higher quality. 86% of the department admit that industry wide standards can and must also be applicable to the Reman Centre. Standards generally creates a promise to produce goods in both an effective and efficient way on an acceptable quality level (Dalmolen, 2015). Standards create an inter-organizational collaboration that produces knowledge which one would otherwise not be able to produce when working alone. Data quality is an essential component of producing a world-class product. Inter-organizational participation can help the company to produce the highest quality goods and have access to cutting edge manufacturing standards.

81% of the department agrees that the good use of information can only make the department better in all its spheres. 96% of the department agree that there is a need to continuously improve quality standards, even when the company is doing well. 75% of the department is motivated by good quality outputs and productivity rather than only a salary. There is no strong correlation between high salary and good quality of productivity. Performing employees are generally not well paid but well engaged (motivated). Motivation is intrinsic while salaries are extrinsic. People can be paid well but still produce poor work while motivated employees can earn less but produce good quality work (Walters, 2016).

4.7. New Strategy Implementation

96% of the department agree that the Reman Centre staff is ready to support the new strategy if introduced. 100% of the department agree that they need new information to boost quality and productivity. Generally, most of employees in companies are older people. In the Reman Centre, 53% of the staff is young. This means that most of these employees are technologically savvy. Jorgenson, Ho and Stiroh (2008) state that through the introduction of CQI, productivity and quality

have the possibility to double in the manufacturing sector.

78% of the department is willing to contribute their efforts beyond their job description. 96% of the staff agree that the decline in the company is their responsibility. 58% have no faith towards the leadership or management of the department. There are only 42% of the staff that has faith in the leadership of the department, which is a very small number considering the role expected from management.

100% of the department understands that the number of warranties received, impacts the company and threatens their jobs effectively. Therefore, the growth of the company lies in everybody's hands. 92% of the department is in agreement that good housekeeping and productivity are interrelated. Housekeeping is one of the lean strategies that seeks to promote the culture of cleanness in a department (Goriwondo, 2013). The principle of orderliness promotes productivity because all wastage is eliminated and only what is being used, is neat or tidy and in the work environment.

The majority of employees from the Reman Centre are dedicated and committed to see the company produce the highest level of quality. Very few employees (12%) show signs of a lack of commitment and dedication towards producing good quality in the department. The company must pay attention to the 12% workers and ensure that they change their perspective on quality. 88% of the department is keen to see quality standards grow.

5. Conclusion and Recommendations

Conclusions to be made are influenced by the data that has been collected. The focus of the research for this article was to determine what impact the introduction of continuous quality improvement can have on production in the Reman Centre.

The method currently used to drive quality and productivity in the department remains a major contributor to poor quality. This is also the cause for poor customer loyalty towards Reman products and is a source of negative perception that the department currently suffers from.

The department has a high calibre of both young inexperienced and older experienced personnel. This is a perfect mixture for skills and knowledge transfer, but the department does not have a quality and productivity management system that can assist in skills integration versus quality and productivity enhancement.

The Reman Centre also has a good balance of racial difference. This is necessary because race differences have a strong influence on culture. Reman as a department can use its racial diversification to inform its corporate culture which can be evident towards it quality and productivity output.

There is a good mix of age and experience in the department even where the younger employees are the majority. However, the younger employees can learn a lot from the older employees during the skills transfer processes. The age and experience cycle in the department is so good that it can be used to sustain the quality and productivity culture for many years to come. The level of education in the department is an advantage. The employees have the capacity to drive the system either as ordinary employees or system specialists.

A large number of the employees in the department understand the concept "quality". Most of the employees were happy with their quality delivery but a majority of them believed that they can deliver much better products than what they are delivering. 84% of the Reman Centre employees rated their current quality output as average. They are aware that what they are producing is not of the highest quality. 71% of the employees confirmed that their product quality is not competitive.

When they were asked if they would like to adapt to a new quality management standard, 93% of the employees agreed that the company needs to adapt a new quality system. When employees were asked if a new system will improve productivity, 89% of the department said that productivity will definitely improve although it will drop during the introduction phase.

The Reman Centre is according to the findings and data gathered during the research, ready for the introduction of CQI as system and philosophy to take the company forward. The CQI philosophy acknowledges that most challenges in the industry are a direct result of a fragmented workflow and CQI is able to resolve the root cause of fragmented processes, and it therefore improves communication, efficiency and interdependence throughout the business operations. The Reman Centre management must grab the opportunity and immediately start with the introduction phase.

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