IMPLEMENTATION OF ISO/TS 16949 AND PERFORMANCE OF AUTOMOTIVE INDUSTRY IN KENYA: A CASE STUDY OF ASSOCIATED BATTERY MANUFACTURERS EAST AFRICA LIMITED, NAIROBI

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A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF MANAGEMENT AND LEADERSHIP IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF MANAGEMENT AND LEADERSHIP OF THE MANAGEMENT UNIVERSITY OF AFRICA.

SEPTEMBER, 2018
DECLARATION

This research project is my original work and has not been presented for a degree award in any other University.

Signature…………………………… Date ………………………

Njine Nyawira Irene

MML/9/00091/1/2017

This research project has been submitted for examination with my approval as University Supervisor

Signature…………………………… Date ………………………

Juster Nyaga

The Management University of Africa
DEDICATION

I dedicate this research project to my Father, Mum and my siblings.
ACKNOWLEDGEMENT

I truly thank God for His grace, wisdom and guidance throughout the process of this research project. I sincerely express my gratitude to my Supervisor Juster Nyaga for her valuable support, guidance and input during the consultations. I thank Management University of Africa (MUA) including the lecturers and all other staff members for their support during the lectures. I also thank the School of Management and Leadership at MUA for the support, guidance and motivation throughout the course period. I finally thank Associated Battery Manufacturers (East Africa) Ltd for the co-operation they accorded me during the research project.
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<td>ABM</td>
<td>Associated Battery Manufacturers</td>
</tr>
<tr>
<td>AIAG</td>
<td>Automotive Industry Action Group</td>
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<td>APQP</td>
<td>Advanced Product Quality Planning</td>
</tr>
<tr>
<td>EAC</td>
<td>East African Community</td>
</tr>
<tr>
<td>FMEA</td>
<td>Failure Mode and Effect Analysis</td>
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<td>HR</td>
<td>Human Resource</td>
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<td>HRD</td>
<td>Human Resource Development</td>
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<td>HRM</td>
<td>Human Resource Management</td>
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<tr>
<td>IAOB</td>
<td>International Automotive Oversight Bureau</td>
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<td>IATF</td>
<td>International Automotive Task Force</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
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<tr>
<td>MSA</td>
<td>Measurement System Analysis</td>
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<td>NGOs</td>
<td>Non-Governmental Organizations</td>
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<tr>
<td>PDCA</td>
<td>Plan-Do-Check-Act</td>
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<tr>
<td>PPAP</td>
<td>Production Parts Approval Process</td>
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<td>PPM</td>
<td>Program Project Management</td>
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<tr>
<td>QFD</td>
<td>Quality Function Deployment</td>
</tr>
<tr>
<td>QMS</td>
<td>Quality Management System</td>
</tr>
<tr>
<td>R &amp; D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>SPC</td>
<td>Statistical Process Control</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>TQM</td>
<td>Total Quality Management</td>
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<tr>
<td>TS</td>
<td>Technical Specification</td>
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<td><strong>OPERATIONAL DEFINITION OF TERMS</strong></td>
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<td>-------------------------------------</td>
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<tr>
<td><strong>Control plan</strong></td>
<td>Documented description of the systems and processes required for controlling product</td>
</tr>
<tr>
<td><strong>Error proofing</strong></td>
<td>Product and manufacturing process design and development to prevent manufacture of nonconforming products</td>
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<tr>
<td><strong>Manufacturing</strong></td>
<td>Process of making or fabricating production materials, production or service parts, assemblies, or heat treating, welding, painting, plating or other finishing services</td>
</tr>
<tr>
<td><strong>Predictive maintenance</strong></td>
<td>Activities based on process data aimed at the avoidance of maintenance problems by prediction of likely failure modes</td>
</tr>
<tr>
<td><strong>Premium freight</strong></td>
<td>Extra costs or charges incurred additional to contracted delivery</td>
</tr>
<tr>
<td><strong>Preventive maintenance</strong></td>
<td>Planned action to eliminate causes of equipment failure and unscheduled interruptions to production, as an output of the manufacturing process design</td>
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<tr>
<td><strong>Remote location</strong></td>
<td>Location that supports sites and at which non-production processes occur</td>
</tr>
<tr>
<td><strong>Site</strong></td>
<td>Location at which value-added manufacturing processes occur</td>
</tr>
<tr>
<td><strong>Special characteristic</strong></td>
<td>Product characteristic or manufacturing process parameter which can affect safety or compliance with regulations, fit, function, performance or subsequent processing of product</td>
</tr>
<tr>
<td><strong>Standard</strong></td>
<td>Document that provides rules or guidelines to achieve order in a given context.</td>
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<tr>
<td><strong>Technical specification</strong></td>
<td>Document stating requirements</td>
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ABSTRACT

The objective of this study was to determine the relationship between implementation of ISO/TS 16949 and organizational performance in the automotive industry. Specifically, the study focused on determining how leadership, resource management, staff competence and process monitoring affect the performance of the automotive related industry. The results of the study sought to benefit the automotive industry, international bodies like the international automotive task force (IATF), customers in the automotive sector as well as other scholars and researchers. The study involved extensive review of empirical literature of related studies for all the study variables to identify any research gaps. The study employed descriptive research design. The target population for the study was 482 staff at Associated Battery Manufacturers (ABM) East Africa Limited which is currently implementing ISO/TS 16949. During data collection, 145 staff working in the organization were sampled using stratified simple random sampling. Questionnaires were physically administered to the sample population. A pilot study was conducted to test the accuracy of the research instruments to ensure reliability and validity of research data. Data was processed and analysed qualitatively and quantitatively. Descriptive statistics including mean and standard deviation was used to analyse data. The relationship between independent and dependent variables was determined using regression model using Statistical Package for Social Sciences (SPSS) version 20. Research findings were presented using graphs, pie charts and frequency tables. The research findings indicate that resource management explains 53.6 percent of organizational performance at ABM (EA) Limited and process monitoring explains 58.5 percent of organizational performance at ABM (EA) Limited. Both resource management and process monitoring explain 63.9 percent of organizational performance at ABM (EA) Limited. The research findings further indicated that leadership and staff competence did not have statistical significant impact on performance at ABM (EA) Limited. The study therefore concluded that resource management and process monitoring had positive and significant impact on performance at ABM (EA) Limited. The study further concluded that resource management had the most influence on performance at ABM (EA) Limited. The researcher therefore recommends that top management should determine the optimal resources needed and provide those resources for effective implementation of ISO/TS 16949. The researcher also recommends that automotive industries should continually improve on their process monitoring activities by carrying out regular audits on the manufacturing process and on the product. The researcher further recommends future comparative research on automotive industries to compare findings from different automotive companies.
CHAPTER ONE

INTRODUCTION

1.0 Introduction
This chapter presents the background of the study, introduces each variable, statement of the problem, objectives and research questions, justifies the need for the study and shows the significance of the study. It further describes the scope of study and present the chapter summary.

1.1 Background of the Study
The global Automotive Industry is facing challenges due to the rapid growth of the supply base in emerging markets, and the need to improve performance as reliable and cost effective sources of supply (Peter, Nick & Barry, 1992). Peter et al., (1992) identified the car industry as particularly important because it is the single largest industrial sector in the world economy and it has traditionally led the way in establishing patterns of work organization for other sectors. Within the United Kingdom, Peter et al., (1992) identified the motor industry as a representative of the biggest single source of manufacturing output despite a massive rationalization of productive capacity in recent years.

Since the introduction of the ISO TS 16949, a number of the organizations have taken up the implementation of the standard. The organizations have adopted the quality management system as a strategic decision of the organization. Some of the organizations implementing ISO/TS 16949 include BMW Group, Chrysler Group, Daimler AG, FIAT Group Automobile, Ford Motor Company, General Motors Company, PSA Peugeot Citroen and Renault SA (www.iatfglobaloversight.org).

1.1.1 Leadership
Ulle and Kumar (2014) revealed that leadership is not only creating a vision, but also ensures to translate that vision into a reality through excellence of execution. The leader’s ability to develop and lead a long-term vision for the organization, driven by ever changing customer requirements, are guided by the interrelated core values and concepts. Total Quality Management (TQM) is successful in organizations by sustained leadership with a purpose, communication among teams and total commitment by the top management which focus on the customer satisfaction.
Leadership is a critical factor for success in projects. There are negative personal attributes that cause project managers’ leadership of large construction projects to be ineffective such as wrongful use of power, poor communication ability, lack of experience, lack of capability to control complex situations, and blaming others for failure (Toor & Ogunlana, 2009). Toor and Ogunlana (2009) noted that these negative personal attributes made project leaders appear incompetent and less popular among their colleagues and subordinates. Blaming others for failures and using excessive power by leaders caused lack of trust and confidence among subordinates, leading to a decline in performance and lack of interest in the job. Negative attributes also make project managers unable to develop a strong team and unable to form connected relationships with project stakeholders. This impacts negatively on the effectiveness of the project manager’s leadership (Toor & Ogunlana, 2009).

Project managers play a key role as leaders in achieving successful outcomes on projects. The effectiveness of their leadership depends largely on their personal attributes, the readiness of their followers, and various environmental factors such as the characteristics of the organization, the characteristics of the project, socio-economic and cultural variables. Negative personal attributes as well as organizational neutralizers (such as lack of resources, lack of planning and control, lack of strategic management and lack of top management support) can be detrimental to the effectiveness of leadership in construction projects. Therefore, in addition to developing the positive personal attributes of leadership in project managers, it is also important that construction organizations pay attention to reducing the factors that negatively affect their performance and effectiveness (Toor & Ogunlana, 2009).

1.1.2 Resource Management

Having the right personnel at the right place and at the right time is of utmost importance to the survival and success of any organization. Performance work practices are associated with lower employee turnover, greater productivity and higher corporate financial performance. Some of the Human Resource Management (HRM) components with positive impact on the financial performance of a firm include selective staffing, extensive training, empowerment, performance evaluation, broad job design. These HRM components also have a positive effect on organizational outcomes, especially with respect to a firm’s human resource (HR) performance—employee productivity, job satisfaction and commitment (Wan, Ong & Kok, 2002).
Effective implementation of key strategic HRM practices should be able to bring in higher levels of organizational performance where different aspects of performance could be affected by different strategic HRM variables. For a company promoting financial performance, performance appraisal is the most important issue to tackle whereas companies interested in enhancing HR performance may emphasize the need for empowerment and training (Wan, Ong & Kok, 2002).

There are numerous constraints in the growth of automotive industry. These are: shortage of power, non-availability of easy financing schemes, high cost of raw materials, complex taxation structure, higher taxes, non-availability of good testing laboratories, stringent pollution control norms, lack of adequate Research & Development facilities, lower labour and machine productivity, obsolete technology, poor infrastructure and high power cost (Kathuria & Singh, 2015).

Firms require external financing to meet certain needs such as: diversification requirements, technological upgradation and modernization, quality improvement, working capital, testing and quality approval, investment in Research & Development infrastructure and capacity expansion. On the basis of sales turnover, the purpose considered for raising external finance are diversification, testing and quality approval, quality improvement, technological upgradation and modernization and meeting working capital requirements (Kathuria & Singh, 2015).

1.1.3 Staff Competence

The necessary competence for personnel performing work affecting conformity to product requirements shall be determined. Organizations must provide training or take other actions to achieve the necessary competence, as applicable. The organization shall ensure that personnel with product design responsibility are competent to achieve design requirements and are skilled in applicable tools and techniques (International Organization for Standardization, 2009).

According to DaSilva (2008), global operational presence is no longer an option; it is a necessity for business success. However, before a company moves to an international supply base the business must have as a core competence the discipline to plan and execute and the enabling processes and information technology systems to support the new realities. Without these factors in place, significant obstacles emerge as cultural conflicts drive unexpected costs. Given these facts and an understanding that global competition does not only represent low cost economics
and volume, but also includes innovation, corporate leaders need to recognize the importance of rapid response capabilities.

1.1.4 Process Monitoring

Monitoring information relating to customer perception as to whether the organization has met customer requirements is one of the measurements of performance of the quality management system. Monitoring customer perception can include obtaining input from sources such as customer satisfaction surveys, customer data on delivered product quality, user opinion surveys, lost business analysis, compliments, warranty claims and dealer reports. Customer satisfaction can be monitored through continual evaluation of performance of the product realization processes. Performance indicators can include: delivered part quality performance, customer disruptions, including field returns, delivery schedule performance and customer notifications related to quality or delivery issues. Monitoring the performance of manufacturing processes helps to demonstrate compliance with customer requirements for product quality and efficiency of the process (International Organization for Standardization, 2009).

Bevilacqua, Emanuele, Giacchetta and Marchetti (2011) identified five pillars of the ISO/TS 16949 as: production part approval process, advanced product quality planning, failure modes and effect analysis, statistical process control (SPC), and measurement system analysis (MSA). Statistical process control is a tool that allows to monitor the process, to promptly identify process drift and to take real time corrective actions avoiding non-complying products and pursuing a continuous improvement of the quality by involving the entire structure with the main aim of gaining increased performances and greater competitiveness.

1.1.5 Performance

According to Yeh, Pai & Huang (2013), implementation of this technical specification by automotive organizations had resulted into numerous benefits such as customer satisfaction and reduction in non-conforming products. Compliance to statutory and regulatory requirements in the automotive companies was also largely associated with the implementation of this international standard. Benefits brought by the implementation of this quality standard in automobile industry includes the cost being averagely saved by 6% or above, defective ratio decreasing up to 48%, on-time delivery being improved up to 38%, occupation ratio in original equipment manufacturing market increasing by 23% (Automotive Industry Action Group, 1995), working quality improvement, production capability increase, and responding time to customer complaints being shortened (Huber & Coleman, 1999).
In the study by Laosirihongthong (as cited in Bevilacqua, Emanuele, Giacchetta, & Marchetti, 2011), said that companies must develop and maintain a high degree of coherence among competitive priorities, order-winning criteria, and improvement activities due to the competitive market and customer pressures. The results of the study indicated that the focused competitive priorities of automotive manufacturing companies in India and Thailand were improving product and process-related quality and on-time delivery. The study also found that companies were trying to enhance the competitive priorities by implementing one of the two infrastructural manufacturing strategies from among total quality management, just-in-time production, Statistical Process Control (SPC), and material requirements planning. He finally concluded that conformance quality and manufacturing efficiency were considered the most important order-winning criteria in the automotive manufacturing industry in India and Thailand.

The major strengths against competitors in the automotive industry are consistent quality, quick response system, easy availability of raw materials, cheap labour, competitive prices, technical manpower, better quality, growing domestic market and flexibility in the manufacturing operations (Kathuria & Singh, 2015). Kathuria and Singh (2015) revealed parameters influencing growth of the automotive industry. They include: meeting delivery schedule, adherence to specified quality, product durability, new product development, cost reduction and customization. Palčič, Buchmeister, & Polajnar (as cited in Janez, Lidija, Duhovnik, & Marko, 2014) study established that market and competition conditions change continuously for manufacturing companies. Owing to the dynamics of external factors, companies are forced to constantly review and optimize product realization processes. These market and various other influences require that companies flexibly adapt to the current market circumstances. According to Anis’ic’ and Krzmanovic’ (as cited in Janez et al., 2014), only those companies that can offer innovative, high-quality and cost-effective products, delivered in the shortest possible times, are successful in the automotive industry.

A study carried out by Ogolla (2013) indicated that most of the motor vehicle assemblers in Kenya were facing stiff competition from their rivals. The study indicated that the motor vehicle sector in Kenya was highly competitive suggesting that managers had to embrace quality performance. The study established that motor vehicle assemblers in Kenya have highly prioritized aspects of quality by checking value for money, quality of their performance, ensuring low defect rates and making their products highly reliable. The companies have also put high priority on quality of their services, after sale services and worked to meet ISO certifications. According to Ogolla (2013), the motor vehicle assemblers in Kenya have adopted strategies to
improve on quality. These include hiring skilled personnel, focusing on customer involvement, continuously focusing on improvement, adhering to the government legislation on standards, collaborating on ventures and concentrating on product testing and demonstration. These operational strategies adopted had impact on the performance of the motor vehicle assemblers on profitability, quality of customer services, efficiency of the companies, increased market share of the companies and improved the employee satisfaction.

1.1.6 Background of ABM East Africa Ltd
ABM (E.A) is a Limited battery manufacturing company in Kenya. The company produces automotive batteries and solar batteries (both vented and Maintenance Free). ABM (EA) Limited was established in 1963 by the UK-based Chloride Group to produce batteries in Kenya for a number of British manufacturers including Chloride, Oldham, Lucas and Dunlop. ABM (EA) Limited has a combined workforce of over 700 staff (including casual workers), recovering over 12000 metric tonnes of lead metal, producing over 900,000 batteries and making solar panels with a capacity of over 8,400 kilowatts per year. The company is guided by the vision; "Energy Solutions for All"

ABM (E.A) Ltd implements ISO/TS 16949 technical specification in their manufacturing processes. Customer satisfaction is among ABM's main objectives; ABM (EA) Limited strives to ensure that quality products are supplied at competitive prices and are backed by friendly and efficient service. ABM (EA) Limited has established to pursue the objectives such as: involving all staff in quality and continual improvement actions and to recognize their contribution to the organization's development, minimizing waste through the quest for zero defects by targeting established ideal performance, ensuring compliance with applicable statutory and regulatory requirements and an appropriate return to shareholders' investments (http://www.abmeastafrica.com).

1.2 Statement of the Problem
The global automotive industry is facing challenges due to the rapid growth of the supply base in emerging markets and the need to improve performance as reliable and cost effective sources of supply. The cost ineffectiveness in the automotive industries has been mainly as a result of defects and variations during the manufacturing process. A good example is the Toyota recall where in August 2010, Toyota recalled a total of 8.8 million vehicles due to problems with the accelerator which caused crashes and more than 80 deaths (Jaime, Noriega, & Yamashita, 2015).
The automotive industry has sought to implement ISO/TS 16949 to strive and demonstrate continual improvement in the area of defect prevention and reduction of variation and waste in the supply chain. The industry is also aiming to demonstrate its ability to consistently provide products that meets customer and applicable statutory and regulatory requirements in order to enhance customer satisfaction. Implementation of ISO/TS 16949 also focuses on lean manufacturing principles which many automotive firms have not embraced. This is as evidenced by Seppala and Klemola (as cited in Spencer & Carlan, 2008) who established that with the diffusion of lean production into North American and European automotive firms in the 1980s, lean production principles were not completely taken up in plants; rather firms adopted certain aspects that were perceived to be beneficial, while operating traditionally in other areas. According to Womack, Jones, and Roos (as cited in Spencer & Carlan, 2008), lean production, compared to mass production, relies on half the human effort in the factory, half the manufacturing space, half the investment tools, half the engineering hours, and half the time to develop new products. Lean production suggests several principles, which include teamwork, communication, efficient use of resources, the elimination of wastes, and continual improvement resulting in more value for the customer. Regardless of the implementation of ISO/TS 16949 by the automotive industries, cost ineffectiveness, variations and defects in the manufacturing process are still being evidenced in the industry. Therefore, the researcher is seeking to determine the relationship between implementation of ISO/TS 16949 and performance in the automotive industry in Kenya.

1.3 Objectives of the Study

The main objective of this study was to determine the relationship between implementation of ISO/TS 16949 and performance in the automotive industry in Kenya.

1.3.1 Specific Objectives

The specific objectives of the study were:

i. To determine the relationship between leadership and performance of the automotive industry at Associated Battery Manufacturers (ABM) East Africa Ltd

ii. To assess the relationship between resource management and performance of the automotive industry at Associated Battery Manufacturers (ABM) East Africa Ltd

iii. To establish the relationship between staff competence and performance of the automotive industry at Associated Battery Manufacturers (ABM) East Africa Ltd
iv. To find out the relationship between process monitoring and performance of the automotive industry at Associated Battery Manufacturers (ABM) East Africa Ltd

1.4 Research Questions

This study was guided by the following research questions:

i. What is the relationship between leadership and performance at Associated Battery Manufacturers (ABM) East Africa Ltd?

ii. How does resource management relate to performance at Associated Battery Manufacturers (ABM) East Africa Ltd?

iii. How does staff competence relate to performance at Associated Battery Manufacturers (ABM) East Africa Ltd?

iv. What is the relationship between process monitoring and performance at Associated Battery Manufacturers (ABM) East Africa Ltd?

1.5 Significance of Study

This research will benefit other scholars and researchers to build on their future studies. They will also be able to use the published journal of this study to cite during their research projects. The findings of this study will provide future researchers interested in this area with references and relevant literature during their research work.

Having prepared ISO/TS 16949, IATF will benefit from this study since it will help the task force to realize the relationship between implementation of ISO/TS 16949 and organizational performance. The task force is likely to use the results of this study as input when developing future documents for the automotive industry.

This research will help the automotive industries in realizing the relationship between implementation of ISO/TS 16949 and performance. For the companies already implementing the technical specification, this study will help them discover areas of improvement for effective implementation of ISO/TS 16949. Depending on the outcome of the study, such companies may decide to change their approach in implementing ISO/TS 16949. For companies not implementing ISO/TS 16949, this study will help them to realize which mechanisms to put in place in order to effectively implement ISO/TS 16949 in their organizations. Some of the benefits of implementing the technical specification as outlined in ISO/TS 16949 include the development of a quality
management system that provides for continual improvement, emphasizing defect prevention and the reduction of variation and waste in the supply chain.

This research is likely to benefit customers of automotive and related products. When implementing ISO/TS 16949, the company is required to have a clear methodology of handling customer complaints. When internal or external nonconformities or customer complaints occur, the audit frequency in the company is appropriately increased. The organization is required to take action to eliminate the causes of nonconformities and customer complaints. As a result, customers in the automotive sector are likely to benefit from this study by making informed decisions of which automotive companies to deal or partner with.

1.6 Scope of Study
The scope of study for this research was the automotive industry and the target company was ABM (E.A) Ltd situated along Kampala Road, Industrial Area in Nairobi City County. The study targeted sampled employees from the company. The research was conducted between April to August 2018.

1.7 Chapter Summary
From the foregoing, it is clear that this study is relevant given the rapid growth in the automotive industry as well as the need to meet their customer needs. Taking into consideration the role of cost effectiveness, customer satisfaction and environmental protection in the supply chain, this study area was therefore important. The results of this study are of benefit to many stakeholders, hence the need for the study.
CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction
This chapter contains theoretical literature review, empirical literature review, research gaps, conceptual framework, operationalization of variables and chapter summary.

2.1 Theoretical Literature Review
This research study explored the relationship between implementation of ISO/TS 16949 and performance in the automotive industry in terms of Deming’s Total Quality Management (TQM) theory as well as Crosby’s Quality Management theory.

2.1.1 Deming’s Theory of Total Quality Management
Deming (1986) taught that by adopting appropriate principles of management, organizations can increase quality and simultaneously reduce costs by reducing waste, rework, staff attrition and litigation while increasing customer loyalty. The key is to practice continual improvement and think of manufacturing as a system, not as bits and pieces.

In his theory, Deming (1986) offered fourteen key principles to managers for transforming business effectiveness. These principles include creating constancy of purpose toward improvement of product and service, with the aim to become competitive, to stay in business and to provide jobs. Adopting the new philosophy is a principle applicable to the new economic age. Deming (1986) asked the western management to awaken to the challenge, learn their responsibilities and take on leadership for change. He also emphasized that eliminating the need for massive inspection by building quality into the product in the first place causes independence on inspection to achieve quality.

Deming (1986) advises managers to end the practice of awarding business on the basis of a price tag. Instead, they should aim at minimizing total cost and moving towards a single supplier for any one item, on a long-term relationship of loyalty and trust. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.

Institute training on the job and leadership. The aim of supervision should be to help people and machines and gadgets do a better job. Supervision of management is in need of overhaul, as well
as supervision of production workers. Drive out fear, so that everyone may work effectively for the company. Break down barriers between departments for people to work as a team, to foresee problems of production and usage that may be encountered with the product or service (Deming, 1986).

Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force. Eliminate work standards on the factory floor and substitute the quotas with leadership. Also, eliminate management by objective and management by numbers and numerical goals and substitute with leadership (Deming, 1986).

Deming (1986) urged managers to remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, among other things, abolishment of the annual or merit rating and of management by objectives. Institute a vigorous program of education and self-improvement and put everybody in the company to work to accomplish the transformation since the transformation is everybody's job.

This theory is relevant to this study because these total quality management principles can be adopted by the automotive related industry to effectively implement ISO/TS 16949 in order to increase quality and simultaneously reduce costs by reducing waste, rework, staff attrition and litigation while increasing customer loyalty.

Vaxevanidis, Krivokapic, Stefanatos, Dasic and Petropoulos (2006) revealed that TQM was a great success in Japan. Based on TQM, the quality of Japanese products was regarded as being superior to that of the rest of the world. As a result, in the early 1980s, the United States of America (USA) utilized TQM concepts as tools to compete with Japan. Subsequently, Europe also recognized the need for a keener focus on quality and in the 1990s, TQM concepts spread to Europe. However, making the “road” towards TQM was much more difficult than expected, since there was widespread confusion about the elements of TQM and how they could be implemented. This was because TQM was a rather abstract philosophy and did not have clear guidelines on its implementation. The problem became easier to solve as TQM elements were more clearly understood through the development and the worldwide acceptance of quality award models.
Vaxevanidis et al., 2006 concluded that TQM is a systems approach to management that aims to enhance value to customer by designing and continually improving organizational processes and systems. It provides a new vision for management leadership. It places customers as principal focal point and redefines quality as customer satisfaction. The emphasis is on continuous improvement of processes through employee involvement and empowerment.

In their study, Balakrishnan, Seshadri, Sheopuri and Iyer (2007) suggested that the entire Indian automotive component sector had improved on multiple fronts. Most firms in the automotive sector had adopted TQM practices, which resulted in quality and delivery improvements as well as increase in productivity and profitability. Deming’s theory of Total Quality Management is relevant to this study because it mainly focusses on increasing quality and simultaneously reducing costs by reducing waste and rework. This is in line with ISO/TS 16949 which requires the development of a quality management system that emphasizes on defect prevention and the reduction of variation and waste in the supply chain.

2.1.2 Crosby’s Theory of Quality Management

Crosby (1986) identified fourteen steps that rely on the foundational thought that any money a company spends upon quality improvement is money that is well-spent. In his theory, Crosby (1986) cited four absolutes of quality management. First, a company ought to define quality not as something that is good or something that is exquisite but instead as something that conforms to company, stakeholder, or end-user requirements. Second, quality starts with prevention - defects should be prevented rather than found after the fact. By preventing defects and other obstacles to quality, companies save money. Third, the standard for performance for any company needs to be zero defects, otherwise, it just doesn't cut it. Fourth, in order to measure quality, rather than relying upon intricate indices, companies need to focus on the Price of Nonconformance. The price of nonconformance, sometimes called the cost of quality, is a measure of the costs associated with producing a product or service of low quality (Crosby, 1986).

Crosby (1986) also identified fourteen (14) steps of that are meant to keep your quality improvement project on track. First and foremost, management must be committed to improving the quality in a company. This commitment must also be transparent to all employees so that proper attitudes towards a Zero Defect product or service line are modeled. Forming a quality
improvement team is the second step to achieving total quality management. He advises that the team members who will model quality improvement commitment should be those who are not already over-committed to other projects. The quality improvement team should be able to effectively commit themselves to improvement of quality.

Crosby (1986) stated that before establishing a plan for improving quality, you first have to know exactly where your products and services lie when it comes to conforming to requirements. Thus, the third step on Crosby’s list is to measure quality. Determine where there is room for improvement and where potential for improvement exists. You also need to ask yourself how much is the cost of nonconformance to standards as well the cost for quality. By answering these questions, you can demonstrate to all company employees that there is a need for a quality improvement system.

In his theory, Crosby (1986) explains the need to explain how the cost of quality figures into the overall company plan. An organization will need to raise employee awareness to the importance of quality management. By doing this, and making quality a central concern to employees, you will increase the likelihood that your quality improvement efforts will be realized.

Once you determine what your company's quality problems are, take corrective actions to eliminate the defects that have been identified. Be sure that you install a system, using causal analysis techniques, to ensure that the root cause of the problems is identified and that these problems do not recur in the future. You need to create a committee to ensure that there are zero defects in your products and services.

According to Crosby (1986), it is not enough, remember to have "as few as possible" defects. Instead, you really need to have this number at zero and establish a zero-defect tolerance in your company. Ensure that your supervisors can carry out the tasks required of them for maintaining quality. By practicing supervisor training, with quality in mind (and the four absolutes), then you will be more likely to achieve zero-defect status. Hold a quality event, called a zero defects day, where all employees are made aware of the change that has taken place. By holding a zero defects day in your company when implementing a total quality management project, you can be sure that you are increasing awareness for quality in your workplace.

After implementing a change, you will need to ensure that you involve everyone - both employees and supervisors in the goal setting process. By bringing everyone in the company in on setting
goals for improvement, you can ensure greater commitment to achieving zero defects. Error-cause removal is necessary for the successful implementation of any quality improvement effort. Encourage your employees to come to management with any obstacles or issues that arise in attempting to meet improvement goals. By having employees communicate obstacles before they become crises, you can avert many of the dampers for quality improvement efforts (Crosby, 1986).

Implementation of employee recognition is another step that keep your quality improvement project on track. By regularly recognizing those who participate in quality improvement efforts, employees will be much more likely to continue to participate. By bringing together specialists and employees, you can create a focused effort towards creating lasting quality improvement implementations. Make sure your quality councils meet on a regular basis. Quality improvement does not end because you have run out of the fourteen Steps of Crosby. In order to really make improvements in the quality of your products and services, you will need to do it over again (Crosby, 1986).

ISO/TS 16949 focusses on the development of a quality management system that provides for continual improvement, emphasizing defect prevention and the reduction of variation and waste in the supply chain (International Organization for Standardization, 2009). According to Dale (1997), for organizations not committed to total quality management, quality improvement drives exist on paper only. Most of the results for implementing Crosby’s fourteen (14) steps soon collapse as they have no adequate mechanisms to formalize the steps into a permanent part of the organizational fabric.

Crosby’s theory of quality management is relevant to this study because the main focus of this theory is improvement and one of the requirements of ISO/TS 16949 is continual improvement which focusses on control and reduction of variation in product characteristics and manufacturing process parameters.

2.2 Empirical Literature Review

2.2.1 Leadership and Organizational Performance

Ulle and Kumar (2014) revealed that leadership is not only creating a vision, but also ensures to translate that vision into a reality through excellence of execution. The leader’s ability to develop and lead a long-term vision for the organization, driven by ever changing customer requirements,
are guided by the interrelated core values and concepts. Total Quality Management (TQM) is successful in organizations by sustained leadership with a purpose, communication among teams and total commitment by the top management which focus on the customer satisfaction.

In the management systems, many problems are solved in the adhoc manner resulting in the poor organizational efficiency. TQM leaders set directions and therefore create a customer focus, clear, visible values and sets high expectations. The TQM leader ensures formulation of strategies, policies and techniques for achieving excellent performance, stimulating excellence, building knowledge and capabilities among employees (Ulle & Kumar, 2014).

Total quality leadership is an approach to management that focuses on giving top value to customers by building excellence into every aspect of the organization. According to Ulle and Kumar (2014), the characteristics of TQM leaders include commitment to quality and establishing organizational systems and approaches to support quality effort. They encourage and recognize team effort as well train and coach, rather than supervise and direct. This results into empowering rather than controlling the workforce. TQM leaders continually improve communications and learn from problems emphasizing on prevention and improvement rather than cure and maintenance.

TQM leader give attention to internal and external customers’ needs and encourage collaboration rather than competition. They motivate, inspire and encourage the entire workforce to contribute, to develop, to learn, to innovate and to embrace change. TQM leaders serve as a role model through their commitment, ethics and involvement in planning, communicating and coaching the workforce (Ulle & Kumar, 2014).

In their study, Ulle and Kumar (2014) concluded that leadership is one of the basic and the most important needs in every organization. It is often considered as the solution to most organizational issues. Leadership can direct human resources toward the strategic objectives of the organization and ensure that organizational functions are aligned with the external environment. One of the most essential factors contributing to leadership effectiveness is the leadership style. It is among the important components of a leader’s leadership situation, which can cause success in organizations. Leadership style is the typical pattern of behaviour that a leader utilizes to influence his or her subordinates to attain organizational goals (Ulle & Kumar, 2014).
Toor and Ogunlana (2009) identified leadership as a critical factor for success of construction projects. In their research, they established negative personal attributes that cause project managers’ leadership of large construction projects to be ineffective. Wrongful use of power, poor communication ability, lack of experience, lack of capability to control complex situations, and blaming others for failure were rated as the top five attributes that make project managers’ leadership ineffective according to Toor and Ogunlana (2009). They noted that these negative personal attributes made project leaders appear incompetent and less popular among their colleagues and subordinates. Blaming others for failures and using excessive use of power by leaders caused lack of trust and confidence among subordinates, leading to a decline in performance and lack of interest in the job. Negative attributes also make project managers unable to develop a strong team and unable to form connected relationships with project stakeholders. This impacts negatively on the effectiveness of the project manager’s leadership (Toor and Ogunlana, 2009).

Toor and Ogunlana (2009) concluded that project managers play a key role as leaders in achieving successful outcomes on construction projects. The effectiveness of their leadership depends largely on their personal attributes, the readiness of their followers, and various environmental factors such as the characteristics of the organization, the characteristics of the project, socio-economic and cultural variables. They also concluded that negative personal attributes as well as organizational neutralizers (such as lack of resources, lack of planning and control, lack of strategic management and lack of top management support) can be detrimental to the effectiveness of leadership in construction projects. Toor and Ogunlana (2009) therefore recommended that in addition to developing the positive personal attributes of leadership in project managers, it is also important that construction organizations pay attention to reducing the factors that negatively affect their performance and effectiveness.

According to Javidan and House (as cited in Mau, 2017), globalization has not only impacted the policy capacity of states; it has also caused fundamental transformation in the realm of business. Business is increasingly operating on a global scale. Transformation to a borderless world has been witnessed with people, goods and capital now moving freely across the globe. As a result, corporations are no longer wedded to an individual nation-state; rather, they increasingly must deal with global employees, customers, suppliers and even creditors. To succeed in this global environment, organizations now require competent global leaders.
Brownell study (as cited in Mau, 2017) suggested that global leaders are characterized by two sets of competencies: common competencies and distinctive competencies. Common competencies are the foundational skills and knowledge that can be mastered by most people through either a formal business curriculum or some other training and development process while distinctive competencies relate to individual characteristics and are more complex in nature and therefore difficult to achieve. Common competencies are necessary but insufficient for effective global leadership. In his study, Brownell identified seven unique competency clusters in Brownell’s model, each with two or more competencies: They include: intercultural (cultural sensitivity; cultural intelligence; global mindset), social (emotional intelligence; empathy; self-control), creativity/resourcefulness (breakthrough thinking; innovativeness; synergistic orientation), self-knowledge (self-efficacy; self-reflective), positive outlook (vision; passion; optimism), responsiveness (flexible; agile; opportunistic) and decision-making (decisive; sound judgment; intuitive). However, Chaudhuri and Alagaraja (as cited in Cumberland, Herd, Alagaraja & Kerrick, 2016) suggest that Human Resource Development (HRD) professionals need to continually increase their knowledge regarding global leadership competencies and be able to identify which global competencies are needed for the various roles in their organizations.

2.2.2 Resource Management and Organizational Performance

A study by Kamasak (2017) established that although the relative contribution of intangible resources to a firm’s performance was significantly higher than tangible resources, the difference was not considerable. Tangible resources were still significantly associated with all performance measures (especially with sales turnover) and offered unique contributions to firm performance. The study also revealed that the additional explanatory power of intangible resources on performance measures was significant but limited. The results of the study by Kamasak (2017) showed that against the dominant effect of intangible resources on performance, tangible resources still had a non-negligible impact in contributing firm performance within the context of Turkish business environment.

According to Kamasak (2017), although manufacturing efficiency can be increased through intangible resources such as just-in-time and LEAN manufacturing software, relative effects of the tangible resources such as low-cost raw material and labour, modern machinery and equipment, and physical buildings and manufacturing plants are greater.
Kamasak (2017) explained the finding of strong tangible resource effect on firm performance as a result of the Turkish trade and commercial laws which until early 2000s, did not have deterrent penalties against the firms violating intellectual property rights in the country. Therefore, this situation might have also directed Turkish firms to focus on just manufacturing at lower costs in order to sustain competitive advantage rather than offering differentiated services and products to the markets. Under these conditions, many Turkish firms developed a special expertise for manufacturing imitated products (e.g. Lacoste, Louis Vuitton and Tommy Hilfiger).

Kamasak (2017) concluded that developed countries have a strong historical economic tradition based on free market structure, liberalisation and legal protection for intellectual property which enabled the firms of these countries make relatively more thorough strategic decisions in line with the requirements of new economy where service sector had a high share and intangible resources were in the focal concern.

Tseng, Tansuhaj, Hallagan, and McCullough (2007) study impressed upon managers the critical need to accumulate specific assets for swift international growth. Faced with the trend toward economic globalization and the constraint of firm resources, managers often need to make decisions on the extent to which their companies should engage in business expansion overseas. Managers striving for further international expansion would be wise to build a stronger inventory of knowledge-based resources that promote international growth.

Tseng et al. (2007) distinguished between the effects of knowledge-based and property-based resources, by demonstrating that both categories of resources significantly impact on international growth, although the knowledge-based resources have more instant and longer-lasting influences than the property-based ones. The knowledge-based resources relate to particular know-how and skills, and property-based resources relate to specific and well-defined assets.

According to Wan, Ong and Kok (2002), having the right personnel at the right place and at the right time is of utmost importance to the survival and success of any organization. MacDuffie (as cited in Wan, Ong and Kok, 2002) surveyed 62 automotive assembly plants worldwide. His most significant finding was that innovative Human Resource (HR) practices affect performance not individually but as a group. Huselid (as cited in Wan, Ong and Kok, 2002) found that high performance work practices were associated with lower employee turnover, greater productivity and higher corporate financial performance. In their study, Wan, Ong and Kok (2002) used six different variables to measure a firm’s strategic Human Resource Management (HRM) system.
These were: selective staffing, extensive training, empowerment, performance evaluation, broad job design and performance-based pay.

Their study concluded that, with the exception of team-based work and performance-based pay, all the other strategic HRM components had a positive impact on the financial performance of a firm. Also, the strategic HRM variables were found to have a positive effect on organizational outcomes, especially with respect to a firm’s HR performance—employee productivity, job satisfaction and commitment.

Thus, Wan, Ong and Kok (2002) suggested that effective implementation of key strategic HRM practices should be able to bring in higher levels of organizational performance. Further, the study showed a possibility that different aspects of performance could be affected by different strategic HRM variables. For a company promoting financial performance, performance appraisal appeared to be the most important issue to tackle. On the other hand, companies interested in enhancing HR performance may emphasize the need for empowerment and training.

Kathuria and Singh (2015) identified requirements for external financing such as meeting diversification requirements, technological upgradation and modernization, quality improvement, working capital, testing and quality approval, investment in Research & Development infrastructure and capacity expansion. On the basis of sales turnover, the purpose considered for raising external finance are diversification, testing and quality approval, quality improvement, technological upgradation and modernization and meeting working capital requirements. There are numerous constraints in the growth of automotive industry. These are: Shortage of power, non-availability of easy financing schemes, high cost of raw materials, complex taxation structure, higher taxes, non-availability of good testing laboratories, stringent pollution control norms, lack of adequate Research & Development facilities, lower labour and machine productivity, obsolete technology, poor infrastructure and high power cost (Kathuria & Singh, 2015). “The government needs to further improve infrastructural facilities, such as, regular power supply, better infrastructure including Research & Development (R & D) and testing labs, easy finance and simple taxation structure, to help this sector achieve higher share in the domestic as well as global trade. Banks and financial institutions need to plan easy finance schemes for the auto component sector. Dedicated power facility, R & D infrastructure, testing laboratories, pollution control mechanism and financial hubs could be established in the existing auto component clusters to boost the growth of this sector” (Kathuria & Singh, 2015, p. 294).
According to Prasad (as cited in Janez, Lidija, Duhovnik, & Marko, 2014), the main feature of sequential product realization involves sequential execution of stages in the product realization processes where the next stage of the product realization process may begin only after the preceding stage has been completed. Information in a particular process stage is developed gradually, completed and then forwarded to the next stage. However, the main feature of concurrent product realization is a concurrent execution of stages in the product realization processes. In concurrent product realization, the next stage can begin before its preceding stage has been completed. Information in a particular product development process stage is built gradually and is forwarded continuously to the next stage. A transition from sequential to concurrent product realization considerably reduces the time and costs of product realization.

“Basic elements of the uniform standard ISO/TS 16949 for quality planning of car components are based on teamwork, process–project planning of operations, unification of project organizational structures, concurrent product realization, systematic and clear product and process realization, use of unified tools in concurrent product realization and better communication between participants in product realization processes” (Janez, Lidija, Duhovnik, & Marko, 2014, p. 164).

In his study in a chipboard manufacturing company, Dale (1997) established that quality improvement process had a low profile within the organization. It was perceived by senior management that the motivation of workers could have been improved, but this was being suffocated by foremen and supervisors. To solve this problem, an empowerment programme was put in place to ensure that maximum employee motivation and participation was obtained and to allow the empowered personnel to improve the process continuously in order for the organization to reach its goal of a world class manufacturer. However, Dasilva (2008) established that the programme was implemented in an environment with considerable uncertainty. It was assumed by the Manufacturing Executive that, once the empowerment programme was complete, the empowered staff will be able to operate without the quality system. It was contended that the ‘paper systems’ were useless because the shop-floor personnel were not committed to their use.

2.2.3 Staff Competence and Organizational Performance

Srivastava, Sultan and Chashti (2017) study established that innovation competence does influence total competitive performance as a proxy for firm level competitiveness for the processing firms in India. The innovation competence holds a positive relationship with
competitive performance. During the survey, Srivastava et al. (2017) observed that the processing entrepreneurs were keen towards improving innovation capabilities of their firms. It was also found that the limit of the innovation capabilities had been restricted to the products only, and most of the time entrepreneurs imitated the products of the national and international firms. Most of the entrepreneurs followed hit-and-trial method in their approach too. However, there were certain business establishments who were consistently thinking of bringing new products or entering new market segments.

The study by Srivastava et al. (2017) also stated that in cases where it had been established that the competitiveness at firm level had an influence of innovation competence, a strategic approach in building innovation capabilities through incubation of various product and process activities could be taken up, both at structural as well as facilitating agencies. Their study derived an insight for the firms to manage their competences and explore their innovation capabilities to remain competitive.

Quality Function Deployment (QFD) is a systematic structure method of integrating thoughts of customers into the product development process, changing demands of customers into technology and service provided by enterprises as the standard to product establishment or service design. It also involves deploying such design into each product or service program in a systematic way and into relative relation between each factor in manufacture project or each factor in service project, so as to make products or service meet the expectation and demand of customers (Akao, 1990).

According to Bossert (as cited in Yeh, Pai, & Huang, 2013), he believes that QFD can assist companies to understand customer demands, and make products or service meet the expectation and demands of customers. Other than effectively integrating customer demands and product information, QFD is capable of correctly establishing quality standard regarding products or service design (Lowe, Ridgway, & Atkinson, 2000). Wasserman (as cited in Yeh et al., 2013) states that QFD is a tool of crossing multiple functions that exchange market demand into the management decision process contained with variation.

The first five essential factors with preferable improvement during promotion of ISO/TS 16949 are identifying production and service supply process to meet the requirements, staff inside organization supports and decides to participate in ISO/TS 16949, identifying internal customers to meet the requirements to complete product, cross-functional team having good communication,
collaboration and operation, and management level regularly inspects the promotion of ISO/TS16949 by departments (Yeh et al., 2013).

Technical demands with preferable improvement in order to successfully promote ISO/TS 16949 by enterprises are sequenced as customer information collection, internal audit capability, statistical analysis capability, document recording ability, software and hardware operation ability, and enterprise organization ability (Yeh et al., 2013). Collection of customer information, internal audit capability and statistical analysis capability are technical demands in urgent need of strengthening when enterprises promote ISO/TS 16949 certification. It is shown from the results that understanding customer demands is still a prior task of promoting quality certification, whereas internal customers are often neglected by enterprises. In order to continuously improve product and service achievement, enhancement of internal audit capability and statistical analysis capability of employees are both indispensable (Yeh et al., 2013).

According to DaSilva (2008), global operational presence is no longer an option; it is a necessity for business success. However, before a company moves to an international supply base the business must have as a core competence the discipline to plan and execute and the enabling processes and information technology systems to support the new realities. Without these factors in place, significant obstacles emerge as cultural conflicts drive unexpected costs. Given these facts and an understanding that global competition does not only represent low cost economics and volume, but also includes innovation, corporate leaders need to recognize the importance of rapid response capabilities. DaSilva (2008) urges companies to transform to enable execution anywhere, anytime. Corporate managers will need to apply program project management concepts to support the move to a Global Supply Chain and the transition to more comprehensive Supplier Relationship Management in order to achieve and extend competitive advantage.

DaSilva (2008) concluded that Program Project Management (PPM) is an organized methodology that requires attitude and discipline to organize and manage resources to complete new product programs within defined scope, quality, time, and cost parameters. The one-time event characteristics of the PPM process are distinctly different than repetitive operational processes; permanent or semi-permanent ongoing functional work to produce a product or service in volume.

DaSilva (2008) also established that the management of these two processes is very different and requires different skills and information technology infrastructure to achieve the necessary global competence that will deliver business results. The most obvious program project management
challenge that teams face is making sure that a project is delivered within defined constraints. The less obvious, but more difficult PPM challenge involves the optimized allocation and integration of the resources required to meet the schedule, cost, and quality objectives.

Since global competence is a function of speed, combining Program Project Management and Risk Management helps to accelerate the ability to compete across geographies. Mitigating risks in the initial phase of a new product design with supply chain involvement is essential to successful PPM execution. Therefore, Critical Chain Project Management, a process of planning and managing projects that assigns more focus on the resources required to execute project tasks, is essential. In project management, the Critical Chain is the sequence of both precedence and resource dependent key elements that have the potential to prevent a project from being completed on time given finite resources. A Critical Chain project network will tend to keep the resources levelly loaded, but will require them to be flexible in their start times and to quickly switch between tasks and task chains to keep the whole project on schedule. Planning and execution in a competitive global market requires competencies in risk assessment and project management. An improvement in knowledge is necessary to achieve the attitudes and behaviours to be effective in facing diverse cultures in a global market, in combination with effective utilization of continuous improvement tools (Dasilva, 2008).

2.2.4 Process Monitoring and Organizational Performance

Bevilacqua, Emanuele, Giacchetta and Marchetti (2011) identified five pillars of the ISO/TS 16949 as: production part approval process, advanced product quality planning, failure modes and effect analysis, statistical process control (SPC), and measurement system analysis (MSA). SPC is a tool that allows to monitor the process, to promptly identify process drift and to take real time corrective actions avoiding non-complying products and pursuing a continuous improvement of the quality by involving the entire structure with the main aim of gaining increased performances and greater competitiveness. The SPC is based on the seven basic statistical tools defined by Ishikawa (1985): the fishbone diagram along with the histogram, Pareto chart, check sheet, control charts, flowchart, and scatter diagram.

According to Bevilacqua et al. (2011), the control chart is a proven technique for improving productivity. A successful control chart will signal the out-of-control cases promptly so that the number of defectives (scraps and/or reworks) can be reduced. Statistical methods to control
processes (SPC) and improve quality are widely used in company of different sectors. The deployment of those methods in manufacturing environments is a prominent global phenomenon.

Bevilacqua et al. (2011), stated that Managers had frequently justified investments in SPC by citing and/or demonstrating the improvements in quality and costs from the effective implementation and practice of SPC. They also presented conceptual arguments and empirical evidence to further the understanding of the motivational effects that result from the deployment of SPC within production environments. The study then suggested that the effective implementation and practice of SPC would create more enriched jobs for process operators that lead to higher levels of work motivation and job satisfaction.

According to Bevilacqua et al. (2011), two of the main functions of SPC are process monitoring and process variation reduction. They explored the effects and benefits of both autocorrelation and cross-correlation in controlling manufacturing processes using case examples from automotive manufacturing processes. The study showed that making use of the correlation structure in the measurements can greatly reduce variability in the process.

Spencer and Carlan (2008) argued that positive feedback, in the form of deficient preventative maintenance and housekeeping, produced health and safety issues in the local plant environments. Joint health and safety committees, collective bargaining agreements, the governmental system, and the ISO/TS16949 served as negative feedback mechanisms to absorb stresses to local plant environments and rectify health and safety related issues. Nichols’ (as cited in Spencer & Carlan, 2008) examination of industrial injuries in Britain found that most serious injuries resulted from slips, trips, and falls in the work-place. His study indicated that housekeeping and preventative maintenance-related hazards were, in some cases, the fore-most health and safety problem in their respective plants. Spencer and Carlan (2008) identified that reduction in preventative maintenance staff led to machine break downs, which, in turn, cause hazards and ultimately accidents. Further, the reduction in housekeeping and preventative maintenance staff created a compound effect where spills occur, but are not cleaned up, ultimately resulting in slip and fall accidents. They concluded that the combination of just-in-time and lean production had the effect of intensifying the work process, causing the system to falter in other areas like housekeeping and preventative maintenance.

According to Khanna (2005), product quality planning cycle emphasizes up front planning and the act of implementation. The first three quarters of the cycle are devoted to up-front product
quality planning through product/process validation and the fourth quarter is the stage to determine if customers are satisfied, and to support the pursuit of continual improvement. During planning, cross-functional teams should analyze drawing thoroughly to give feasibility communication and resolve all ambiguity with customers before acceptance of the contract. The cost per part should be finalized between the customer and supplier. Suppliers must have control plans that include comprehensive documentation of product/process characteristics, process controls, tests, and measurement systems that will occur during mass production for effective control and meeting customer requirements.

2.2.5 Organizational Performance

ISO/TS 16949 puts production capability, quality, cost, delivery, morale, and security of the interior of enterprises into practice, causes increase in above aspects by using quality operation and management methods to the exterior of enterprises, pursuing the final goal of achieving customer satisfaction. ISO/TS 16949 mainly aims to highlight the development of quality management system on deficiency prevention, continuous improvement provision, and variation and waste reduction (International Organization for Standardization, 2009). This technical regulation with special requirements of customers defines basic quality management process and common quality management methods for suppliers, avoiding a multi-inspection audit process, so that ISO/TS 16949 can more effectively use information and experience as improvement reference (Kymal, 2006). Furthermore, the biggest difference between ISO/TS 16949 and the previous automobile quality certification standards is to highlight particular requirements of customers (Wu, 2002).

Benefits brought by the implementation of this quality standard in automobile industry includes the cost being averagely saved by 6% or above, defective ratio decreasing up to 48%, on-time delivery being improved up to 38%, occupation ratio in original equipment manufacturing market increasing by 23% (Automotive Industry Action Group, 1995), working quality improvement, production capability increase, and responding time to customer complaints being shortened (Huber & Coleman, 1999). Even though ISO/TS 16949 may bring benefits to companies, it does not necessarily mean that all companies are capable of understanding how to effectively utilize this management system in increasing their capability and competitive force.

In his study, Laosirihongthong (as cited in Bevilacqua, Emanuele, Giacchetta, & Marchetti, 2011), said that companies must develop and maintain a high degree of coherence among
competitive priorities, order-winning criteria, and improvement activities due to the competitive market and customer pressures. The results of his study indicated that the focused competitive priorities of automotive manufacturing companies in India and Thailand were improving product and process-related quality and on-time delivery. His study also found that companies were trying to enhance the competitive priorities by implementing one of the two infrastructural manufacturing strategies from among total quality management, just-in-time production, statistical process control (SPC), and material requirements planning. He finally concluded that conformance quality and manufacturing efficiency were considered the most important order-winning criteria in the automotive manufacturing industry in India and Thailand.

The main corrective and preventive actions in automotive manufacturing industry include: increase in checking of working tools, 100% check of raw materials and training on measurements and process control for workers involved in the production line (Bevilacqua et al., 2011). Bevilacqua et al. (2011) concluded that there is need for standardization of the described procedure for process control by the quality management team and its implementation in other production lines.

The major strengths against competitors in the automotive industry are consistent quality, quick response system, easy availability of raw materials, cheap labour, competitive prices, technical manpower, better quality, growing domestic market and flexibility in the manufacturing operations (Kathuria & Singh, 2015). Kathuria and Singh (2015) revealed parameters influencing growth of the automotive industry. They include: meeting delivery schedule, adherence to specified quality, product durability, new product development, cost reduction and customization.

Palčič, Buchmeister and Polajnar (as cited in Janez, Lidija, Duhovnik, & Marko, 2014) study established that market and competition conditions change continuously for manufacturing companies. Owing to the dynamics of external factors, companies are forced to constantly review and optimize product realization processes. These market and various other influences require that companies flexibly adapt to the current market circumstances. According to Anis´ić and Kršmanović´ (as cited in Janez et al., 2014), only those companies that can offer innovative, high-quality and cost-effective products, delivered in the shortest possible times, are successful in the automotive industry. Janez et al. (2014) concluded that implementation of concurrent product realization and advanced product quality planning has a number of benefits in the automotive sector. These benefits include transferring majority of the problems to the initial stages of product
realization, thus, reducing the costs and time for product realization. By use of teamwork approach, it is possible to increase productivity, improve the quality of products and increase customer satisfaction. Other benefits are: clearly defined processes, performance indicators of product realization are defined at the beginning of the project and complex processes implement suitable information system. Better communication and assigned responsibility for the product realization process reduce and prevent misunderstandings and reduce defects (Janez et al., 2014).

### 2.3 Research gaps

Previous research has indicated that even though ISO/TS 16949 may bring benefits to companies, it does not necessarily mean that all companies are capable of understanding how to effectively utilize this management system in increasing their capability and competitive force. The research did not seek to identify why companies are not capable of effectively implementing ISO/TS 16949. Research has also shown that understanding customer demands is still a prior task of promoting quality certification, whereas internal customers are often neglected by enterprises. Therefore, this research targets to establish the relationship between key components of implementing ISO/TS 16949 and organizational performance. These components include: leadership, resource management within the organization, competence of staff involved in implementation of ISO/TS 16949 and process monitoring in the organization.

### 2.4 Conceptual Frame work

Jabareen (2009), defines conceptual framework as a network, or “a plane,” of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena. The concepts that constitute a conceptual framework support one another, articulate their respective phenomena, and establish a framework-specific philosophy. The conceptual framework for this study shows the relationship between the two theories, the four independent variables and the dependent variable which is performance.

<table>
<thead>
<tr>
<th>Theory</th>
<th>Independent Variables</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deming’s Theory of Total Quality Management</td>
<td>Leadership</td>
<td>27</td>
</tr>
</tbody>
</table>
2.5 Operationalization of Variables

Table 2.1: Operationalization of variables

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Type of variable</th>
<th>Indicators</th>
<th>Measure of Indicator</th>
<th>Type of measurement</th>
<th>Type of analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>To establish the relationship between leadership and performance of the automotive industry</td>
<td>Independent</td>
<td>Strategy formulation</td>
<td>Strategies formulated</td>
<td>Ordinal</td>
<td>Descriptive Regression</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strategy implementation</td>
<td>Strategies implemented</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resource provision</td>
<td>Resources provided</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication</td>
<td>Communication process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To establish the relationship between resource management and</td>
<td>Independent</td>
<td>Human resources</td>
<td>Number of staff</td>
<td>Ordinal</td>
<td>Descriptive Regression</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infrastructure</td>
<td>Process equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Financial</td>
<td>Finances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance of the automotive industry</td>
<td>To establish the relationship between staff competence and performance of the automotive industry</td>
<td>Independent</td>
<td>Training Skills</td>
<td>Trainings offered Skills developed</td>
<td>Ordinal</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>----------------</td>
<td>-----------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Performance of the automotive industry</td>
<td>To establish the relationship between monitoring and performance of the automotive industry</td>
<td>Independent</td>
<td>Audits Surveys Action plans Reviews</td>
<td>Manufacturing process audits Products audits Customer perception surveys Implementation of action plans</td>
<td>Ordinal</td>
</tr>
<tr>
<td>Performance of the automotive industry</td>
<td></td>
<td>Dependent</td>
<td>Customer satisfaction Waste reduction Defect reduction Conforming products</td>
<td>Customer satisfaction level Waste levels Defects level Product conformity level</td>
<td>Ordinal</td>
</tr>
</tbody>
</table>

### 2.6 Chapter Summary

This chapter has addressed literature review of the study. The theoretical review has established the relevant theories related to the independent and dependent variables. The empirical review has established that a number of related studies have been carried out. The research gaps have also been highlighted. The key components in implementing ISO/TS 16949 have been discussed and operationalized. They include: leadership, resource management, competence and process monitoring. The chapter has clearly shown how each of these independent variables relate to the
performance of automotive industry which is dependent variable. The chapter has also given key indicators of performance in the automotive industry.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.0 Introduction
This chapter covers the research design, target population, sample and sampling design, data collection instruments, pilot test, data collection procedure, data analysis procedures, data presentation procedures, ethical considerations and chapter summary.

3.1 Research Design
Taylor (2007) defines research design as the guide that contains instructions on the requirements for the research so as to put up the research into an upright and achievable manner. According to Kothari (2004), a research design is the collection and arrangement of conditions of analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.

Descriptive research design was used for this study. Kothari (2004) defines descriptive research studies as those studies which are concerned with describing the characteristics of a particular
individual, or of a group. Examples are: studies concerned with specific predictions, with narration of facts and characteristics concerning individual, group or situation. This study sought to determine the relationship between independent and dependent variables; hence the choice of the research design.

### 3.2 Target Population

Target population according to Kothari (2004) is the group of individuals or objects that the researcher aims to use in conducting the study. The study targeted all levels of permanent staff at Associated Battery Manufacturers Ltd. These included senior managers, middle managers, plant operators and support staff. This target was informed by the fact that implementation of ISO/TS 16949 is everyone’s business in any given organization. It affects the strategy formulators, policy makers, implementers and supervisors as well.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Management</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Middle Level Management</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>Plant operators</td>
<td>357</td>
<td>74</td>
</tr>
<tr>
<td>Support staff</td>
<td>66</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>482</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### 3.3 Sample and Sampling Design

Leedy and Ormrod (2005) defines sampling as the process of sorting and selecting individuals or factors in the target population to come up with a more elaborate and simpler group in which the study will be conducted. According to Kothari (2004), a sample drawn randomly is unbiased in a way that no number of populations has any chance of being selected more than the other. The study used stratified sampling whereby proportionate allocations on different strata were applied.
This method gave respondents from each strata an equal chance to participate. According to Kothari (2004) a sample size of at least 30 percent of the target population is a true representation of the target population for the survey.

### Table 3.2: Sample Size

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Sample size (30%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Management</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Middle Level Management</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>Plant Operators</td>
<td>357</td>
<td>107</td>
</tr>
<tr>
<td>Support staff</td>
<td>66</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>482</strong></td>
<td><strong>145</strong></td>
</tr>
</tbody>
</table>

### 3.4 Data Collection Instruments

Data was collected using questionnaires to ensure the respondents have a sense of confidentiality. According to Kothari (2004), data collection using questionnaires is quite popular, particularly in case of big enquiries. He highlights a number of advantages for using questionnaires to collect data. These are: low cost even when the universe is large and is widely spread geographically, free from the bias of the interviewer; respondents have adequate time to give well thought out answers, respondents, who are not easily approachable, can also be reached conveniently and large samples can be made use of and thus the results can be made more dependable and reliable. These advantages led to the choice of using questionnaires to collect data for this study. The questionnaire had both structured and unstructured questions. Structured questions were accompanied by a list of all possible alternatives or options from which the respondents were to select the answer that best describes their situation. The unstructured question gave the respondents an opportunity to express their opinions on the situation.

### 3.5 Pilot Test

According to Bhattacherjee (2012), pilot study is the testing study that is conducted prior to the actual study so as to determine the accuracy of the research instruments. Through pilot study, the researcher is able to determine whether the actual study will run smoothly or will have
misinterpretations of questions on the questionnaire. According to Connelly (2008), a pilot study sample should be 10% of the sample projected for the larger parent study. A pilot test was done on 15 staff of Amara Raja Batteries Company. The staff were randomly selected and used in the pilot test. The pilot test tested the ability of the questions to measure the desired concept, the degree of accuracy of the measuring tools, and the researcher’s interpretation of data. This exercise helped in ascertaining that the tool was reliable.

3.5.1 Reliability

Wallen (2000), states that reliability indicates the extent to which a measure is free from random error. Random error occurs when effectiveness of measured variable is influenced by other factors besides conceptual factors of interest besides the main variable. In this study, questionnaire reliability was checked by using internal consistency by use of Cronbach alpha method. Fifteen (15) respondents were sampled randomly to fill questionnaires to measure the reliability of the questionnaire. Cronbach alpha was then calculated for all statements in the questionnaire using SPSS. The results were then used to establish the reliability of the questionnaire. Cronbach alpha is a reliability coefficient between two sets of data that ranges between 0 to 1. According to Esposito (2002), a scale that renders a reliability coefficient of above 0.7 is usually regarded as internally reliable instrument. After the reliability analysis of the measurement questions using SPSS, the value of Cronbach alpha was 0.81. This established that the questionnaire was reliable.

3.5.2 Validity

According to Wallen (2000), validity relates to the quality attributed to the degree to which they conform to establish knowledge or truth. It refers to the extent to which an instrument can measure, or, ought to have measured. It is the accuracy and meaningfulness which are based on the research results. This study used construct validity and content validity to measure the validity of the research tool. For construct validity, the questionnaire was divided into several sections to ensure that each section assesses information for a specific objective, and also ensure that the same closely ties to the conceptual framework for this study. To ensure content validity, the questionnaire was subjected to a panel of peers to assess whether each measurement question in the questionnaire was essential, useful but not essential or not necessary. The peer assessors established that the measurement questions in the questionnaire were essential, useful and necessary.
3.6 Data Collection Procedure

According to Kothari (2004), data collection procedure depends on the type of data the researcher will be collecting for the study- primary or secondary data. Collection of primary data through questionnaires is quite popular and is being adopted by private individuals, research workers, private and public organizations and by governments. Once the research proposal was approved, questionnaires as in appendix II were physically distributed to the persons concerned with a request to answer the questions and return the questionnaires. The respondents were expected to read and understand the questions and write down the reply in the space meant for the purpose in the questionnaire itself. The respondents indicated that they required three weeks for filling the questionnaires. The questionnaires were then collected from the respondents as per the agreed timelines.

3.7 Data Analysis Procedures

Since the questionnaire had both structured and unstructured questions, quantitative and qualitative data analysis was employed. Descriptive statistics including mean and standard deviation was used to analyse data as received from the respondents. Regression statistical analysis of data was done to determine the relationship between the independent and dependent variables and to highlight the key findings. The quantitative data was coded into Statistical Package for Social Sciences (SPSS) version 20.0 for analysis.

The regression model used was as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e,$$

Where: $Y$ is the dependent variable (performance in automotive industry),

- $a$ is a constant (the value of $Y$ when all the independent variables are equal to zero),
- $\beta_1$ is the estimated regression coefficient for $X_1$,
- $\beta_2$ is the estimated regression coefficient for $X_2$,
- $\beta_3$ is the estimated regression coefficient for $X_3$,
- $\beta_4$ is the estimated regression coefficient for $X_4$. 

X₁ is the independent variable on leadership,
X₂ is the independent variable on resource management,
X₃ is the independent variable on staff competence,
X₄ is the independent variable on process monitoring
e is the error term.

3.8 Data Presentation Procedures
Since the study is a quantitative research, data was presented in form of graphs, pie charts and frequency tables. This was followed by discussions explaining the meaning of those numbers and percentages.

3.9 Ethical Considerations
As per the ethical principles guiding research, the researcher ensured that the human rights of the respondents were not violated during the study. Respondents were issued with consent forms before the survey and were given the choice of consenting or not without any form of coercion. For those respondents who gave consent, privacy and confidentiality was observed. The respondents were given the option of not responding to the questions they termed as private. The collected information was treated with confidentiality. All the respondents participated on a voluntary basis. Anonymity was adhered to during data analysis to avoid any respondent being victimized. Throughout the study, the researcher was keen on minimizing any form of harm and maximizing the benefits to the respondents.

3.10 Chapter Summary
This chapter has discussed the methodology that was used in the study, it has analysed the research design, target population, the sample design, data collection instruments, pilot test and the data analysis and data presentation procedures.
CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.0 Introduction
This chapter includes presentation of research findings, limitations of the study and chapter summary. The research findings are presented in various sections which include general information of the respondents, descriptive statistics and regression analysis of leadership, resource management, staff competence and process monitoring on organizational performance. The findings are presented in form of graphs, pie charts and frequency tables.

4.1 Response rate
According to the sample size, the researcher was able to administer 145 questionnaires to staff at Associated Battery Manufacturers (EA) Limited. The researcher was able to collect back 105 questionnaires. However, only 98 questionnaires were used for data analysis since seven (7) questionnaires were incomplete and did not meet the criterion for data analysis. According to Kothari (2011), a response of at least 60 percent is acceptable and would still answer the questions that are asked during the survey. The response rate for this study (67.6%) was therefore acceptable.
4.2 General Information

The respondents’ general information is presented in tables and figures and includes gender, age, education level, number of years worked, staff position in the organization and awareness on implementation of ISO/TS 16949. This information provided a general understanding the staff of ABM (EA) Limited staff who participated in the survey.

4.2.1 Gender of Respondents

Figure 4.1: Gender of respondents
Figure 4.1 shows that 88.78 percent were male staff and 11.22 percent were female respondents. The findings indicate that majority of the staff at ABM (EA) Limited are male. This could be attributed to the technical nature of the company which is manufacturing where such firms are mostly staffed by male workers.

4.2.2 Age of Respondents
Figure 4.2: Age of Respondents

Figure 4.2 shows that majority of the respondents were between the age of 26-35 years constituting 62.2 percent. 20.4 percent were between the age of 36-45 years, 11.2 percent were below 25 years and 6.1 percent were between the age of 46-55 years. Most of the staff working at ABM (EA) Limited are young given the manufacturing nature of the company.

4.2.3 Level of Education
Figure 4.3: Level of Education

Figure 4.3 indicates that 24.5 percent of the respondents have primary and secondary level of education, 53.1 percent have college level, 18.4 percent are undergraduate level and 4 percent are post graduate level of education. Majority of the staff are at college level (53.1%) because most staff at ABM (EA) Limited are plant operators in the manufacturing and assembly lines in the factory. The plant operators require technical knowledge and skills which is commensurate to college level of education.

4.2.4 Number of Years Worked
Table 4.1: Number of Years Worked

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5 years</td>
<td>46%</td>
</tr>
<tr>
<td>6-9 years</td>
<td>32.6%</td>
</tr>
<tr>
<td>10-14 years</td>
<td>13.3%</td>
</tr>
<tr>
<td>Over 14 years</td>
<td>8.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 4.1 shows that majority of staff have worked at ABM (EA) Limited for a period between zero to five years (46 percent). 32.6 percent have worked for 6-9 years, 13.3 percent have worked for 10-14 years and 8.1 percent have worked for over 14 years. The high percentage of staff having worked for only 0-5 years can be explained by high turnover since most staff at ABM (EA) are young (26-35 years) and are still seeking other employment or business opportunities in other companies or sectors.

4.2.5 Awareness about Implementation of ISO/TS 16949

![Awareness Level](image)

**Figure 4.4:** Awareness Level

Figure 4.4 shows that 96.94 percent of staff were aware that Associated Battery Manufacturers (East Africa) Limited was implementing ISO/TS 16949 while 3.06 percent were not aware of the
same. The percentage of staff aware of the implementation of ISO/TS in their organization was much higher as compared to those who were not aware. This could be associated with good communication about the effectiveness of ISO/TS 16949 implementation by senior management.

4.2.6 Staff Designation in the Company

![Bar chart showing staff designation]

**Figure 4.5: Staff Designation**

Figure 4.5 shows that 2.04 percent of staff were in senior management positions, 10.2 percent were middle level managers, 54.08 percent were plant operators and 33.67 percent were support staff. The high percentage of plant operators can be explained by the manufacturing nature of the organization. The company manufactures batteries and the production lines are manned by plant operators.
4.3  Leadership and Organizational Performance

Seven statements were presented to staff to state the level to which they disagreed or agreed with regard to leadership and performance. Likert scale of 1-5 was used to rank the responses where 1=strongly disagree (SD), 2=agree (A), 3=uncertain (U), 4=agree (A) and 5=strongly agree (SA). The closer the responses to a mean score of 5 indicated that staff strongly agreed on the relationship between leadership and performance. A lower mean score below 3 means that staff disagreed on the relationship between leadership and performance. 

**Table 4.2:  Table Showing Responses on Leadership**

<table>
<thead>
<tr>
<th>Leadership statements</th>
<th>SD</th>
<th>A</th>
<th>U</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
<th>Std deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a strategy formulated for ISO/TS 16949 implementation</td>
<td>4.1%</td>
<td>1%</td>
<td>12.2%</td>
<td>57.1%</td>
<td>25.5%</td>
<td>3.99</td>
<td>0.891</td>
</tr>
<tr>
<td>The strategy for implementation of ISO/TS 16949 is implemented</td>
<td>4.1%</td>
<td>3%</td>
<td>18.4%</td>
<td>50%</td>
<td>24.5%</td>
<td>3.88</td>
<td>0.955</td>
</tr>
<tr>
<td>Quality objectives have been established</td>
<td>4.1%</td>
<td>0%</td>
<td>3.1%</td>
<td>56.1%</td>
<td>36.7%</td>
<td>4.21</td>
<td>0.853</td>
</tr>
<tr>
<td>Achievement of quality objectives is monitored</td>
<td>3.1%</td>
<td>2%</td>
<td>2%</td>
<td>63.3%</td>
<td>29.6%</td>
<td>4.14</td>
<td>0.812</td>
</tr>
<tr>
<td>There is a budget for implementation of ISO/TS 16949</td>
<td>4.1%</td>
<td>4.1%</td>
<td>23.5%</td>
<td>45.9%</td>
<td>22.4%</td>
<td>3.79</td>
<td>0.977</td>
</tr>
<tr>
<td>I am aware of my responsibilities and authorities at ABM (E.A) Ltd</td>
<td>3.1%</td>
<td>1%</td>
<td>1%</td>
<td>38.85</td>
<td>56.15</td>
<td>4.44</td>
<td>0.838</td>
</tr>
<tr>
<td>Senior management communicates about the effectiveness of ISO/TS 16949 implementation</td>
<td>7.1%</td>
<td>4.1%</td>
<td>11.2%</td>
<td>42.9%</td>
<td>34.7%</td>
<td>3.94</td>
<td>1.129</td>
</tr>
</tbody>
</table>

4.3.1  Descriptive Statistics

Table 4.2 shows that the statement with the highest mean score observed in the results was *I am aware of my responsibilities and authorities at ABM (E.A) Ltd* (Mean=4.44; Standard Deviation=0.838). The second most ranked statement was *Quality objectives have been set*
(Mean=4.21; Standard Deviation=0.853) followed by *Achievement of quality objectives is monitored* (Mean=4.14; Standard Deviation=0.812). All the statements for leadership had mean scores of more than three. These findings showed that staff generally agreed with the statements on the relationship between leadership and performance.

### 4.3.2 Regression Analysis

**Table 4.3:** Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.811&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.657</td>
<td>.646</td>
<td>.42456</td>
</tr>
</tbody>
</table>

<sup>a</sup> Predictors: (Constant), Monitoring, Resources, Competence

After regression analysis, Table 4.3 showed the model summary between performance and three variables- process monitoring, resource management and staff competence with adjusted R square ($R^2$) of 0.646. This means 64.6 percent of performance at ABM (EA) Limited is explained by process monitoring, resource management and staff competence.

**Table 4.4:** Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.811&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.657</td>
<td>.642</td>
<td>.42683</td>
</tr>
</tbody>
</table>

<sup>a</sup> Predictors: (Constant), leadership, Competence, Resources, Monitoring

The model summary after including leadership as the fourth variable had adjusted R square ($R^2$) of 0.642 as shown in Table 4.4. This means 64.2 percent of performance at ABM (EA) Limited is explained by process monitoring, resource management, staff competence and leadership. The difference after including leadership was negligible (0.4 percent). This means the effect of leadership on the overall model was insignificant.
Table 4.5: Excluded Variables\textsuperscript{a}

<table>
<thead>
<tr>
<th>Model</th>
<th>Beta In</th>
<th>t</th>
<th>Sig.</th>
<th>Partial Correlation</th>
<th>Collinearity Statistics</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>leadership</td>
<td>.180\textsuperscript{b}</td>
<td>1.537</td>
<td>.128</td>
<td>.156</td>
<td>.307</td>
<td></td>
</tr>
<tr>
<td>Resources</td>
<td>.364\textsuperscript{b}</td>
<td>3.925</td>
<td>.000</td>
<td>.374</td>
<td>.434</td>
<td></td>
</tr>
<tr>
<td>Competence</td>
<td>.398\textsuperscript{b}</td>
<td>3.281</td>
<td>.001</td>
<td>.319</td>
<td>.264</td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{a.} Dependent Variable: Performance

\textsuperscript{b.} Predictors in the Model: (Constant), Monitoring

Table 4.5 shows the regression coefficient for leadership as 0.180, for resource management as 0.364 and for staff competence as 0.398. This means that a unit increase in leadership led to a 0.180 increase in performance at ABM (EA) Limited with all other factors held constant. A unit increase in resource management led to 0.364 increase in performance and a unit increase in staff competence led to 0.398 increase in performance with all other factors held constant. Table 4.5 showed the significance value for leadership, p = 0.128 with process monitoring as the predictor in the model. This means that the relationship between leadership and performance was insignificant since 0.128 is much higher than 0.05. As a result, the variable for leadership was excluded from the regression model.

This finding does not agree with the study by Ulle and Kumar (2014) which revealed that leadership is not only creating a vision, but also ensures to translate that vision into a reality through excellence of execution. The study revealed that leader’s ability to develop and lead a long-term vision for the organization, driven by ever changing customer requirements, are guided by the interrelated core values and concepts. The study concluded that Total Quality Management (TQM) is successful in organizations by sustained leadership with a purpose, communication among teams and total commitment by the top management which focus on the customer satisfaction.

This finding does not also agree with Toor and Ogunlana (2009) study which identified leadership as a critical factor for success of construction projects. In their research, they established negative personal attributes that cause project managers’ leadership of large projects to be ineffective. Toor
and Ogunlana (2009) concluded that project managers play a key role as leaders in achieving successful outcomes on projects.

### 4.4 Resource Management and Organizational Performance

Eight statements were presented to staff to state the level to which they disagreed or agreed with regard to resource management and performance. Likert scale of 1-5 was used to rank the responses where 1=strongly disagree (SD), 2=agree (A), 3=uncertain (U), 4=agree (A) and 5=strongly agree (SA). The closer the responses to a mean score of 5 indicated that staff strongly agreed on the relationship between resource management and performance. A lower mean score below 3 means that staff disagreed on the relationship between resource management and performance.

**Table 4.6: Responses on Resource Management**

<table>
<thead>
<tr>
<th>Resource statements</th>
<th>SD</th>
<th>A</th>
<th>U</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
<th>Std deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of staff in every department are adequate</td>
<td>12.2%</td>
<td>15.3%</td>
<td>18.4%</td>
<td>35.7%</td>
<td>18.4%</td>
<td>3.33</td>
<td>1.283</td>
</tr>
<tr>
<td>The workload for each staff is optimal</td>
<td>8.2%</td>
<td>10.2%</td>
<td>21.4%</td>
<td>45.9%</td>
<td>14.3%</td>
<td>3.48</td>
<td>1.114</td>
</tr>
<tr>
<td>Employees are motivated to achieve quality objectives</td>
<td>11.2%</td>
<td>3.1%</td>
<td>12.2%</td>
<td>40.8%</td>
<td>32.7%</td>
<td>3.81</td>
<td>1.249</td>
</tr>
<tr>
<td>Equipment needed to achieve product conformity are provided</td>
<td>3.1%</td>
<td>4.1%</td>
<td>9.2%</td>
<td>51%</td>
<td>32.7%</td>
<td>4.06</td>
<td>0.929</td>
</tr>
<tr>
<td>The workspace is adequate</td>
<td>10.2%</td>
<td>12.2%</td>
<td>12.2%</td>
<td>43.9%</td>
<td>21.4%</td>
<td>3.54</td>
<td>1.245</td>
</tr>
<tr>
<td>Work environment is safe</td>
<td>6.1%</td>
<td>6.1%</td>
<td>12.2%</td>
<td>50%</td>
<td>25.5%</td>
<td>3.83</td>
<td>1.075</td>
</tr>
<tr>
<td>Support e.g. ICT and transport are provided</td>
<td>7.1%</td>
<td>6.1%</td>
<td>3.1%</td>
<td>46.9%</td>
<td>36.7%</td>
<td>4.00</td>
<td>1.140</td>
</tr>
<tr>
<td>Finances needed to implement ISO/TS 16949 are provided</td>
<td>3.1%</td>
<td>5.1%</td>
<td>29.6%</td>
<td>41.8%</td>
<td>20.4%</td>
<td>3.71</td>
<td>0.952</td>
</tr>
</tbody>
</table>

#### 4.4.1 Descriptive Statistics
Table 4.6 shows that the statement with the highest mean score observed in the results was *Equipment needed to achieve product conformity are provided* (Mean=4.06; Standard Deviation=0.929). The second most ranked statement was *Support e.g. ICT and transport are provided* (Mean=4.00; Standard Deviation=1.140) followed by *Work environment is safe* (Mean=3.83; Standard Deviation=1.075). All the statements for resource management had mean scores of more than three. These findings showed that staff generally agreed with the statements on the relationship between resource management and performance.

### 4.4.2 Regression Analysis

**Table 4.7: Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.735a</td>
<td>.540</td>
<td>.536</td>
<td>.48638</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Resources

After regression analysis, Table 4.7 shows the model summary of resource management with adjusted R square ($R^2$) of 0.536. This means resource management explains 53.6 percent of organizational performance at ABM (EA) Limited.

**Table 4.8: Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.767a</td>
<td>.589</td>
<td>.585</td>
<td>.45999</td>
</tr>
<tr>
<td>2</td>
<td>.804b</td>
<td>.646</td>
<td>.639</td>
<td>.42894</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Monitoring
b. Predictors: (Constant), Monitoring, Resources

Table 4.8 shows the model summary for process monitoring with adjusted R square ($R^2$) of 0.585. This means process monitoring explains 58.5 percent of organizational performance at ABM (EA) Limited. Table 4.8 showed the model summary for both process monitoring and resource management with adjusted R square ($R^2$) of 0.639. This means both process monitoring and resource management explain 63.9 percent of organizational performance at ABM (EA) Limited.
### Table 4.9: Analysis of Variance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>26.702</td>
<td>1</td>
<td>26.702</td>
<td>112.874</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>22.710</td>
<td>96</td>
<td>.237</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>49.413</td>
<td>97</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a. Dependent Variable: Performance

b. Predictors: (Constant), Resources

The Analysis of Variance (ANOVA) results (Table 4.9) shows that the significance value for resource management, \( p = 0.000 \). This means resource management had statistical significant impact on organizational performance at ABM (EA) Limited.

This finding agrees with Kamasak (2017) who stated that although manufacturing efficiency can be increased through intangible resources such as just-in-time and LEAN manufacturing software, relative effects of the tangible resources such as low-cost raw material and labour, modern machinery and equipment, and physical buildings and manufacturing plants were greater.

The finding also agrees with Wan, Ong and Kok (2002), who established that having the right personnel at the right place and at the right time is of utmost importance to the survival and success of any organization. MacDuffie after surveying 62 automotive assembly plants worldwide also found out that innovative Human Resource (HR) practices affect performance not individually but as a group.

### 4.5 Staff Competence and Organizational Performance

Seven statements were presented to staff to state the level to which they disagreed or agreed with regard to staff competence and performance. Likert scale of 1-5 was used to rank the responses where 1=strongly disagree (SD), 2=agree (A), 3=uncertain (U), 4=agree (A) and 5=strongly agree (SA). The closer the responses to a mean score of 5 indicated that staff strongly agreed on the
relationship between resource management and performance. A lower mean score below 3 means that staff disagreed on the relationship between staff competence and performance.

Table 4.10: Responses on Staff Competence

<table>
<thead>
<tr>
<th>Competence statements</th>
<th>SD</th>
<th>A</th>
<th>U</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
<th>Std deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff training needs are identified</td>
<td>3.1%</td>
<td>5.1%</td>
<td>12.2%</td>
<td>58.2</td>
<td>21%</td>
<td>3.90</td>
<td>0.902</td>
</tr>
<tr>
<td>Staff are trained as per the training needs</td>
<td>4.1%</td>
<td>5.1%</td>
<td>8.2%</td>
<td>54.1%</td>
<td>28.6%</td>
<td>3.98</td>
<td>0.974</td>
</tr>
<tr>
<td>On-the-job training is provided</td>
<td>2%</td>
<td>7.1%</td>
<td>6.1%</td>
<td>53.1%</td>
<td>31.6%</td>
<td>4.05</td>
<td>0.924</td>
</tr>
<tr>
<td>Effectiveness of the trainings is evaluated</td>
<td>5.1%</td>
<td>5.1%</td>
<td>10.2%</td>
<td>56.1%</td>
<td>23.5%</td>
<td>3.88</td>
<td>0.998</td>
</tr>
<tr>
<td>Staff designing products are competent to achieve design requirements</td>
<td>1%</td>
<td>5.1%</td>
<td>14.3%</td>
<td>57.1%</td>
<td>22.4%</td>
<td>3.95</td>
<td>0.817</td>
</tr>
<tr>
<td>Staff designing products have skills on design tools and techniques</td>
<td>4.1%</td>
<td>5.1%</td>
<td>12.2%</td>
<td>53.1%</td>
<td>25.5%</td>
<td>3.91</td>
<td>0.975</td>
</tr>
<tr>
<td>Products are designed by experienced staff</td>
<td>8.2%</td>
<td>4.1%</td>
<td>6.1%</td>
<td>54.1%</td>
<td>27.6%</td>
<td>3.89</td>
<td>1.111</td>
</tr>
</tbody>
</table>

4.5.1 Descriptive Statistics

Table 4.10 shows that the statement with the highest mean score observed in the results was *On-the-job training is provided* (Mean=4.05; Standard Deviation=0.924). The second most ranked statement was *Staff are trained as per the training needs* (Mean=3.98; Standard Deviation=0.974) followed by *Staff designing products are competent to achieve design requirements* (Mean=3.95; Standard Deviation=0.817). All the statements for staff competence had mean scores of more than
three. These findings showed that staff generally agreed with the statements on the relationship between staff competence and performance.

4.5.2 Regression Analysis

**Table 4.11:** Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>.767</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.589</td>
<td>.585</td>
<td>.45999</td>
</tr>
<tr>
<td>2</td>
<td><strong>.804</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.646</td>
<td>.639</td>
<td>.42894</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Monitoring  

b. Predictors: (Constant), Monitoring, Resources

After regression analysis, Table 4.11 shows the model summary between performance and process monitoring with adjusted R square ($R^2$) of 0.585. This means that 58.5 percent of performance at ABM (EA) Limited is explained by process monitoring. Table 4.11 showed the model summary between performance and two variables-resource management and process monitoring with adjusted R square ($R^2$) of 0.639. This means that 63.9 percent of performance at ABM (EA) Limited is explained by resource management and process monitoring.

**Table 4.12:** Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>.811</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.657</td>
<td>.646</td>
<td>.42456</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Monitoring, Resources, Competence

The model summary after including staff competence as the third variable had adjusted R square ($R^2$) of 0.646 as shown in Table 4.12. This means that 64.6 percent of performance at ABM (EA) Limited is explained by process monitoring, resource management and staff competence. The difference after including staff competence was negligible (0.7 percent). This means the effect of staff competence on the overall model was insignificant.
Table 4.13: Excluded Variables\textsuperscript{a}

<table>
<thead>
<tr>
<th>Model</th>
<th>Beta In</th>
<th>t</th>
<th>Sig.</th>
<th>Partial Correlation</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>Competence</td>
<td>.230\textsuperscript{c}</td>
<td>1.723</td>
<td>.088</td>
<td>.175</td>
<td>.206</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Dependent Variable: Performance

\textsuperscript{c} Predictors in the Model: (Constant), Monitoring, Resources

Table 4.13 shows regression coefficient for staff competence as 0.230. This means that a unit increase in staff competence led to a 0.230 increase in performance at ABM (EA) Limited with all other factors held constant. Table 4.13 showed the significance value for staff competence, \( p = 0.088 \) with both resource management and process monitoring as the predictors in the model. This means that the relationship between staff competence and performance was insignificant since 0.088 is higher than 0.05. As a result, the variable for staff competence was excluded from the regression model.

The finding does not agree with Srivastava et al. (2017) study which established that innovation competence does influence total competitive performance as a proxy for firm level competitiveness for the processing firms in India. The study concluded that the innovation competence holds a positive relationship with competitive performance. Their study also derived an insight for the firms to manage their competences and explore their innovation capabilities to remain competitive.

This finding does not agree with the study by DaSilva (2008), who states that global operational presence is no longer an option; but a necessity for business success. DaSilva (2008) established that before a company moves to an international supply base the business must have as a core competence the discipline to plan and execute and the enabling processes and information technology systems to support the new realities.
4.6 Process Monitoring and Organizational Performance

Eight statements were presented to staff to state the level to which they disagreed or agreed with regard to process monitoring and performance. Likert scale of 1-5 was used to rank the responses where 1=strongly disagree (SD), 2=agree (A), 3=uncertain (U), 4=agree (A) and 5=strongly agree (SA). The closer the responses to a mean score of 5 indicated that staff strongly agreed on the relationship between resource management and performance. A lower mean score below 3 means that staff disagreed on the relationship between process monitoring and performance.

Table 4.14: Responses on Process Monitoring

<table>
<thead>
<tr>
<th>Monitoring statements</th>
<th>SD</th>
<th>A</th>
<th>U</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
<th>Std deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a process for reviewing customer</td>
<td>4.1%</td>
<td>2%</td>
<td>22.4%</td>
<td>55.1%</td>
<td>16.3%</td>
<td>3.78</td>
<td>0.891</td>
</tr>
<tr>
<td>engineering specifications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a process for distributing</td>
<td>4.1%</td>
<td>3.1%</td>
<td>21.5</td>
<td>57.1%</td>
<td>14.3%</td>
<td>3.74</td>
<td>0.889</td>
</tr>
<tr>
<td>customer engineering specifications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a process for implementing</td>
<td>4.1%</td>
<td>1%</td>
<td>21.4%</td>
<td>53.1%</td>
<td>20.4%</td>
<td>3.85</td>
<td>0.901</td>
</tr>
<tr>
<td>customer engineering specifications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing process audits to determine</td>
<td>2.0%</td>
<td>2.0%</td>
<td>4.1%</td>
<td>53.1%</td>
<td>38.8%</td>
<td>4.24</td>
<td>0.800</td>
</tr>
<tr>
<td>effectiveness are carried out</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product audits to verify conformity</td>
<td>4.1%</td>
<td>0%</td>
<td>8.2%</td>
<td>55.1%</td>
<td>32.7%</td>
<td>4.12</td>
<td>0.877</td>
</tr>
<tr>
<td>are carried out</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer perception surveys</td>
<td>5.1%</td>
<td>1.0%</td>
<td>25.5%</td>
<td>49%</td>
<td>19.4%</td>
<td>3.77</td>
<td>0.950</td>
</tr>
<tr>
<td>are carried out</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a defined process for solving</td>
<td>3.1%</td>
<td>1.0%</td>
<td>16.3%</td>
<td>52%</td>
<td>27.6%</td>
<td>4.00</td>
<td>0.873</td>
</tr>
<tr>
<td>customer problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action plans are developed for</td>
<td>4.1%</td>
<td>1.0%</td>
<td>2.0%</td>
<td>51%</td>
<td>41.8%</td>
<td>4.26</td>
<td>0.889</td>
</tr>
</tbody>
</table>
4.6.1 Descriptive Statistics

Table 4.14 shows that the statement with the highest mean score observed in the results was *Action plans are developed for addressing nonconforming products* (Mean=4.26; Standard Deviation=0.889). The second most ranked statement was *Manufacturing process audits to determine effectiveness are carried out* (Mean=4.24; Standard Deviation=0.800) followed by *Product audits to verify conformity are carried out* (Mean=4.12; Standard Deviation=0.877). All the statements for process monitoring had mean scores of more than three. These findings showed that staff generally agreed with the statements on the relationship between process monitoring and performance.

4.6.2 Regression Analysis

**Table 4.15: Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.767&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.589</td>
<td>.585</td>
<td>.45999</td>
</tr>
</tbody>
</table>

<sup>a</sup> Predictors: (Constant), Monitoring

After regression analysis, Table 4.15 shows the model summary of process monitoring with adjusted R square ($R^2$) of 0.585. This means 58.5% of organizational performance at ABM (EA) Limited is explained by process monitoring.

**Table 4.16: Analysis of Variance**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>29.100</td>
<td>1</td>
<td>29.100</td>
<td>137.524</td>
<td>.000&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>1 Residual</td>
<td>20.313</td>
<td>96</td>
<td>.212</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>49.413</td>
<td>97</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>
a. Dependent Variable: Performance
b. Predictors: (Constant), Monitoring

The Analysis of Variance results (Table 4.16) shows that the significance value for process monitoring, p = 0.000. This means process monitoring had statistical significant impact on organizational performance at ABM (EA) Limited.

This finding agrees with Bevilacqua et al. (2011) who identified five pillars of the ISO/TS 16949 as: production part approval process, advanced product quality planning, failure modes and effect analysis, statistical process control (SPC), and measurement system analysis (MSA). SPC is a tool that allows to monitor the process, to promptly identify process drift and to take real time corrective actions avoiding non-complying products and pursuing a continuous improvement of the quality by involving the entire structure with the main aim of gaining increased performances and greater competitiveness.

According to Bevilacqua et al. (2011), the control chart is a proven technique for improving productivity. A successful control chart will signal the out-of-control cases promptly so that the number of defective (scraps and/or reworks) can be reduced. Statistical methods to control processes (SPC) and improve quality are widely used in company of different sectors. The deployment of those methods in manufacturing environments is a prominent global phenomenon.

4.7 Regression Model

Table 4.17: Coefficients

<table>
<thead>
<tr>
<th>Coefficientsa</th>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td>.911</td>
<td>.246</td>
<td>3.709</td>
<td>.000</td>
</tr>
<tr>
<td>Resources</td>
<td></td>
<td>.318</td>
<td>.081</td>
<td>.364</td>
<td>3.925</td>
</tr>
<tr>
<td>Monitoring</td>
<td></td>
<td>.490</td>
<td>.092</td>
<td>.494</td>
<td>5.333</td>
</tr>
</tbody>
</table>

Table 4.17 shows the regression coefficients for resource management as 0.318 and that of process monitoring as 0.49. The regression coefficients show the size and the direction of
relationship between the independent and dependent variable. Therefore, the regression model is as follows:

\[ Y = a + \beta_1 X_1 + \beta_2 X_2 + e \]

\[ Y = 0.911 + 0.318X_1 + 0.49X_2 \]

Where, \( Y \)= Performance, \( a \)= constant, \( X_1 \)= Resource management and \( X_2 \)= Process monitoring

The regression model shows that a unit increase in resource management led to a 0.318 increase in performance at ABM (EA) Limited with all other factors held constant. This was significant since the p value for resource management was 0.000 as shown on Table 4.17. A unit increase in process monitoring led to 0.49 increase in performance at ABM (EA) Limited with all other factors held constant. This was significant since the p value for process monitoring was 0.000 as shown on Table 4.17.

### 4.8 Qualitative Analysis

After qualitative analysis of the answers to the unstructured question in the questionnaire, there were other benefits that can be attributed to the implementation of ISO/TS 16949 at ABM (EA) Limited. 11 percent of the respondents indicated that implementation of ISO/TS 16949 could lead to improved product quality. 7 percent of the respondents indicated that implementation of ISO/TS could lead to increased market share and increased demand of ABM (EA) Limited products.

This agrees with the study by Ogolla (2013), which identified that the motor vehicle assemblers in Kenya had adopted strategies to improve on quality. These include hiring skilled personnel, focusing on customer involvement, continuously focusing on improvement, adhering to the government legislation on standards, collaborating on ventures and concentrating on product testing and demonstration. According to Ogolla (2013), these operational strategies adopted had impact on the performance of the motor vehicle assemblers on profitability, quality of customer services, efficiency of the companies, increased market share of the companies and improved the employee satisfaction.
4.9 Reliability Analysis

Table 4.18: Reliability Statistics

<table>
<thead>
<tr>
<th>Item</th>
<th>Cronbach's Alpha</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership</td>
<td>0.926</td>
<td>7</td>
</tr>
<tr>
<td>Resource management</td>
<td>0.869</td>
<td>8</td>
</tr>
<tr>
<td>Staff competence</td>
<td>0.913</td>
<td>7</td>
</tr>
<tr>
<td>Process monitoring</td>
<td>0.927</td>
<td>8</td>
</tr>
<tr>
<td>Performance</td>
<td>0.888</td>
<td>5</td>
</tr>
</tbody>
</table>

After reliability analysis, the Cronbach's Alpha coefficients of the four independent variables (leadership, resource management, staff competence and process monitoring) and one dependent variable (organizational performance) are as shown in Table 4.18. All the coefficients were greater than 0.7 and thus acceptable. This shows that the tool used for data collection was reliable.

4.10 Limitations of the Study

Most automotive industries in Kenya are not implementing ISO/TS 16949 technical specification. As a result, the study was carried out in one firm which is currently implementing the technical specification. This limited the study in having results from one firm since there was no other firm to compare with. Limited number of studies have been done on ISO/TS 16949 implementation in Kenya and this made it difficult in finding literature on the same to review.

During data collection, some respondents were hesitant in filling the questionnaires despite the researcher assuring them of confidentiality, anonymity and privacy. Some questionnaires were partially filled and could not be used for data analysis. Some answers given to the unstructured question did not match with the question.

4.11 Chapter Summary

This chapter presented the results and significant findings of the study. The results were presented in tables, graphs and charts followed by the researchers own interpretation. The chapter was
presented in sections which included response rate, respondents’ general information, descriptive analysis, regression analysis, qualitative analysis and analysis of reliability. The findings and results for each independent variable were discussed and findings were tied to the literature review.

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

5.0 Introduction
This chapter contains summary of findings highlighting major findings under each independent variable, recommendations based on the study and activities that could help in achieving the recommendations. The recommendations for implications, suggestions for future research and conclusion for the study are also covered.

5.1 Summary of Findings
The general objective of the study was to determine the relationship between implementation of ISO/TS 16949 and performance in the automotive related industry in Kenya. Specifically, the study sought to determine the relationship between leadership, resource management, staff competence and process monitoring and organizational performance at Associated Battery Manufacturers (EA) Limited. The findings of the study for each independent variable were as follows:

5.1.1 Leadership and Performance
All the statements for leadership had mean scores of more than three. This showed that staff generally agreed with the statements on the relationship between leadership and performance. The Cronbach alpha coefficient for the statements under leadership was 0.926 indicating a reliable tool. After regression analysis, the significance value for leadership was 0.128. This means that leadership did not have statistical significant impact on performance at Associated Battery Manufacturers (EA) Limited.

5.1.2 Resource Management and Performance
All the statements for resource management had mean scores of more than three. This showed that staff generally agreed with the statements on the relationship between resource management and performance. The Cronbach alpha coefficient for the statements under resource management was 0.869 indicating a reliable tool. After regression analysis, the researcher established that resource management explains 53.6 percent of organizational performance at ABM (EA) Limited

5.1.3 Staff Competence and Performance

All the statements for staff competence had mean scores of more than three. This showed that staff generally agreed with the statements on the relationship between staff competence and performance. The Cronbach alpha coefficient for the statements under staff competence was 0.913 indicating a reliable tool. After regression analysis, the significance value for staff competence was 0.088. This means that staff competence did not have statistical significant impact on performance at Associated Battery Manufacturers (EA) Limited.

5.1.4 Process Monitoring and Performance

All the statements for process monitoring had mean scores of more than three. This showed that staff generally agreed with the statements on the relationship between process monitoring and performance. The Cronbach alpha coefficient for the statements under process monitoring was 0.927 indicating a reliable tool. After regression analysis, the researcher established that process monitoring explains 58.5 percent of organizational performance at ABM (EA) Limited

5.2 Recommendations

5.2.1 Leadership and Performance

The study established that leadership did not have statistical significant impact on performance. This could indicate that implementing ISO/TS 16949 at Associated Battery Manufacturers (EA) is considered to be more than a leadership drive (top-down) and everyone is responsible for effective implementation of ISO/TS 16949. The study therefore recommends that senior managers continuously communicate to the staff that ISO/TS 16949 implementation is not owned and driven by management but it is everyone’s business.

5.2.2 Resource Management and Performance
The study established that resource management explains 53.6 percent of performance at Associated Battery Manufacturers (EA) Limited. The study therefore recommends that ABM (EA) Limited should consistently determine the resources required for implementation of ISO/TS 16949. This can be done by top management determining the optimal resources needed and providing the resources for effective implementation of ISO/TS 16949. The resources could be personnel, equipment, adequate work space and safe work environment.

5.2.3 **Staff competence and Performance**

The study established that staff competence did not have statistical significant impact on performance. This could indicate that staff are already competent and skilled in performing their duties. The study therefore recommends that Associated Battery Manufacturers (EA) Limited should maintain the competence of its employees at all levels. This can be done by continually hiring competent and skilled staff.

5.2.4 **Process Monitoring and Performance**

The study established that process monitoring explains 58.5 percent of performance at Associated Battery Manufacturers (EA) Limited. The study therefore recommends that ABM (EA) Limited should continually improve on their process monitoring activities. This can be done by carrying out regular audits on the manufacturing process and on the product. Corrective actions should be taken without undue delay to address any non-conforming products. Customer perception surveys are also recommended in order to get customer feedback.

5.3 **Implications and Recommendations for future research**

The study has established that resource management and process monitoring have significant impact on organizational performance. The automotive industry should therefore focus on providing optimal resources for effective implementation of ISO/TS 16949. The focus should be mainly on process equipment, support services such as ICT and safe work environment. The industry should also focus on enhancing process monitoring activities in order to promptly identify any processes that need improvement. The main process monitoring activities include manufacturing process audits and product audits.

The study identified that both resource management and process monitoring explain 63.9 percent of performance at ABM (E.A) Limited. There is need for future research to identify other factors.
that account for the remaining 26.1 percent of performance in the automotive related industry on Kenya. The study was carried out in one organization which is currently implementing ISO/TS 16949 technical specification. Future comparative research is recommended when other automotive industries come on board in order to compare findings from different automotive companies.

5.4 Conclusion

The general objective of the study was to determine the relationship between implementation of ISO/TS 16949 and performance in the automotive related industry in Kenya. Specifically, the study sought to determine the relationship between leadership, resource management, staff competence and process monitoring and organizational performance at Associated Battery Manufacturers (EA) Limited.

The study confirmed that there was no significant impact of leadership on performance in the automotive related industry. The researcher therefore concludes that leadership has no significant impact on performance at Associated Battery Manufacturers (EA) Limited. The study further confirmed that among four independent variables-leadership, resource management, staff competence and process monitoring, leadership had the least impact on performance at Associated Battery Manufacturers (EA) Limited.

The study reaffirmed that there is a positive and significant relationship between resource management and performance in the automotive related industry. The study therefore concludes that there is a positive and significant impact of resource management on performance at ABM (EA) Limited. The study further concludes that among the four independent variables included in the study, resource management had the second most influence on performance at ABM (EA) Limited.

The study confirmed that there was no significant impact of staff competence on performance in the automotive related industry. The researcher therefore concludes that staff competence has no significant impact on performance at Associated Battery Manufacturers (EA) Limited. The study further confirmed that among four independent variables-leadership, resource management, staff competence and process monitoring, staff competence had the second least impact on performance at Associated Battery Manufacturers (EA) Limited.
The study reaffirmed that there is a positive and significant relationship between process monitoring and performance in the automotive related industry. The study therefore concludes that there is a positive and significant impact of process monitoring on performance at ABM (EA) Limited. The study further concludes that among the four independent variables included in the study, process monitoring had the most influence on performance at ABM (EA) Limited.

REFERENCES


APPENDIX I: INTRODUCTION LETTER
TO WHOM IT MAY CONCERN

RE: DATA COLLECTION BY NJINE NYAWIRA IRENE

My name is Njine Irene, a Masters student at Management University of Africa. In partial fulfilment of the requirements of the award of master of management and leadership, I am conducting an academic research on implementation of ISO/TS 16949 and performance of automotive industry in Kenya: a case study of ABM (E.A) Ltd, Nairobi. This letter is to humbly request you to respond to the questions in the attached questionnaire to enable me carry out this research. This is an academic exercise and you are assured of anonymity and confidentiality.

Thank you in advance for your willingness to contribute to this research.

Yours truly,

Njine N. Irene
APPENDIX II: RESEARCH STUDY QUESTIONNAIRE

SECTION A: GENERAL INFORMATION

1. Please indicate your gender

   Male [ ]  Female [ ]

2. Please indicate your age bracket

   25 years and below [ ]
   26-35 years [ ]
   36-45 years [ ]
   46-55 years [ ]
   Above 55 years [ ]

3. What is your education level? (Tick as applicable)

   a) Primary and Secondary [ ]
   b) College [ ]
   c) Graduate [ ]
   d) Post graduate [ ]

   Others-specified ..........................................................
4. For how long have you been working at Associated Battery Manufacturers (East Africa) Ltd?
   a) 0-5 years [ ]
   b) 6-9 years [ ]
   c) 10-14 years [ ]
   d) Over 14 years [ ]

5. Are you aware that Associated Battery Manufacturers (East Africa) Ltd is implementing ISO/TS 16949?
   Yes [ ] No [ ]

6. Please indicate your designation in the organization.
   Senior Manager [ ]
   Middle level Manager [ ]
   Plant operator [ ]
   Support staff [ ]

**SECTION B: LEADERSHIP**

1. To what level do you agree with the following statements with regard to leadership in implementation of ISO/TS 16949 at Associated Battery Manufacturers (East Africa) Ltd?

   Use a scale of 1-5 whereby 1= Strongly disagree, 2= Disagree, 3=Uncertain, 4=Agree, 5=Strongly agree.

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<tr>
<td>There is a strategy formulated for ISO/TS 16949 implementation</td>
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<tr>
<td>The strategy for implementation of ISO/TS 16949 is implemented</td>
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<tr>
<td>Quality objectives have been established</td>
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</table>
Achievement of quality objectives is monitored

There is a budget for implementation of ISO/TS 16949

I am aware of my responsibilities and authorities at ABM (E.A) Ltd

Senior management communicates about the effectiveness of ISO/TS 16949 implementation

### SECTION C: RESOURCE MANAGEMENT

1. To what extent do you agree with the following statements on resource management in implementation of ISO/TS 16949 at Associated Battery Manufacturers (East Africa) Ltd?

   Use a scale of 1-5 whereby 1= Strongly disagree, 2= Disagree, 3=Uncertain, 4=Agree, 5=Strongly agree.

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<tr>
<td>The number of staff in every department are adequate</td>
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<tr>
<td>The workload for each staff is optimal</td>
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<tr>
<td>Employees are motivated to achieve quality objectives</td>
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<tr>
<td>Equipment needed to achieve product conformity are provided</td>
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<tr>
<td>The workspace is adequate</td>
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<tr>
<td>Work environment is safe</td>
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SECTION D: STAFF COMPETENCE

1. To what extent do you agree with the following statements on staff competence in implementation of ISO/TS 16949 at Associated Battery Manufacturers (East Africa) Ltd?

   Use a scale of 1-5 whereby 1= Strongly disagree, 2= Disagree, 3=Uncertain, 4=Agree, 5=Strongly agree.

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<tbody>
<tr>
<td>Staff training needs are identified</td>
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<tr>
<td>Staff are trained as per the training needs</td>
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<tr>
<td>On-the-job training is provided</td>
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<tr>
<td>Effectiveness of the trainings is evaluated</td>
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<tr>
<td>Staff designing products are competent to achieve design requirements</td>
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<tr>
<td>Staff designing products have skills on design tools and techniques</td>
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<td>Products are designed by experienced staff</td>
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</table>
SECTION E: PROCESS MONITORING

1. To what extent do you agree with the following statements on process monitoring in implementation of ISO/TS 16949 at Associated Battery Manufacturers (East Africa) Ltd?

Use a scale of 1-5 whereby 1= Strongly disagree, 2= Disagree, 3=Uncertain, 4=Agree, 5=Strongly agree.

<table>
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<th>STATEMENT</th>
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<tbody>
<tr>
<td>There is a process for reviewing customer engineering specifications</td>
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<tr>
<td>There is a process for distributing customer engineering specifications</td>
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<tr>
<td>There is a process for implementing customer engineering specifications</td>
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<tr>
<td>Manufacturing process audits to determine effectiveness are carried out</td>
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<tr>
<td>Product audits to verify conformity are carried out</td>
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<tr>
<td>Customer perception surveys are carried out</td>
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<td>There is a defined process for solving customer problems</td>
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<td>Action plans are developed for addressing nonconforming products</td>
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</table>
SECTION F: PERFORMANCE

1. To what extent do you agree with the following statements on performance attributed to implementation of ISO/TS 16949 at Associated Battery Manufacturers (East Africa) Ltd?

   Use a scale of 1-5 whereby 1= Strongly disagree, 2= Disagree, 3=Uncertain, 4=Agree, 5=Strongly agree.

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>Our customers are delighted with our products</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Customer complaints have decreased</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Our products conform to requirements</td>
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<tr>
<td>Waste has reduced in the production process</td>
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<tr>
<td>Defects have reduced in the production process</td>
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</table>

2. What other benefits can be attributed to the implementation of ISO/TS 16949 at Associated Battery Manufacturers (East Africa) Ltd? ..............................................................
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