MAGYAR AGRÁR- ÉS ÉLETTUDOMÁNYI EGYETEM

BACHELOR'S THESIS

Hungarian University of Agriculture and Life Sciences (MATE)

Business Administration and Management

Quality Management at Eaton

MAHIM FIROZ KHAN

Supervisor: Dr. Szalay Zsigmond Gabor

Neptun Code: BHVTDO

Faculty/Department: Economics and Social Sciences

Godollo

2023

Quality Management at Eaton

Table of Contents

List of Figures

List of Tables

I. INTRODUCTION

Background of Eaton Corporation

Eaton Corporation is a global power management company founded in 1911 by Joseph O. Eaton in Cleveland, Ohio. The business specializes in technology for electrical, hydraulic, and mechanical power management. It provides services to clients in the industrial, automotive, building, aerospace, and defense sectors. Electrical components, power distribution and control systems, fuel systems, and aircraft components are among its offerings. The corporation employs approximately 96,000 people worldwide and has operations in more than 175 nations.

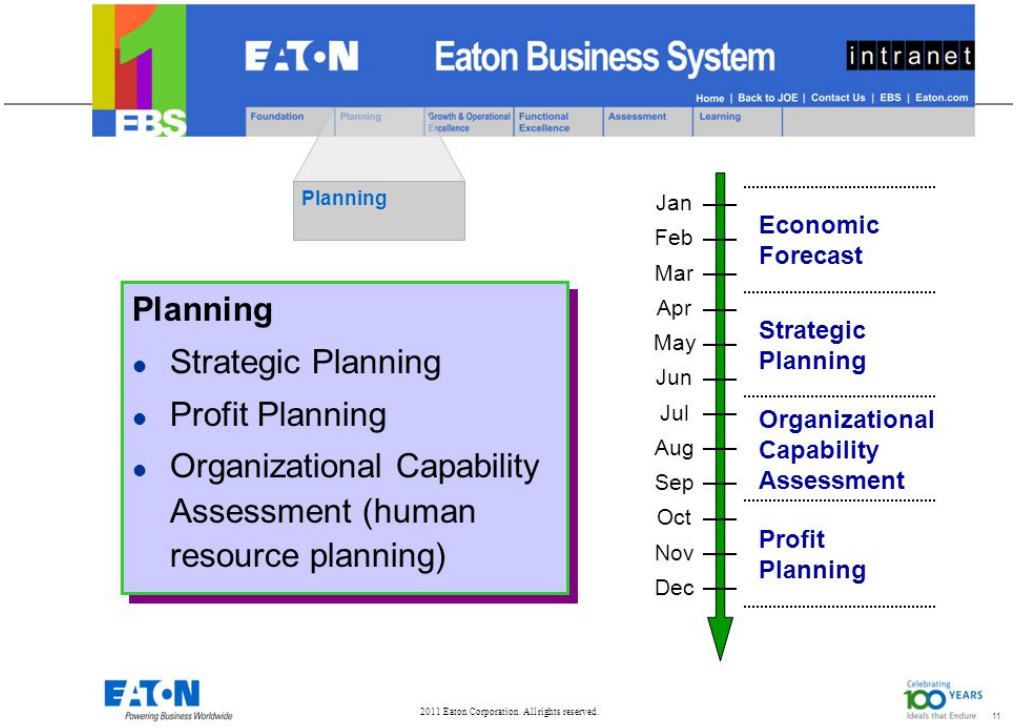
Eaton Corporation is a multinational power management company that produces electrical, hydraulic, and mechanical components for a wide range of industries, including aerospace, automotive, construction, and industrial. The company was founded in 1911 by Joseph Eaton and Viggo Torbensen in the United States and has since grown to become a global leader in power management solutions.

Eaton's products and services include electrical distribution and control equipment, uninterruptible power systems (UPS), hydraulic components, and mechanical power transmission products. The agency has over 95,000 personnel global and operates in extra than a hundred seventy five countries.

In recent years, Eaton has strongly emphasised sustainability and committed to reducing its carbon footprint and promoting environmental stewardship. The company has set targets for reducing greenhouse gas emissions, increasing the use of renewable energy, and improving energy efficiency in its operations.

Given its global reach and diverse product portfolio, Eaton faces numerous challenges in maintaining consistent quality across its operations. As such, the company has implemented a comprehensive quality management system to ensure that its products and services meet or exceed customer expectations. This system includes a range of tools and processes for monitoring and improving quality, such as Six Sigma, Total Quality Management (TQM), and Lean Manufacturing.

Considering Eaton's importance as a major player in the power management industry and the challenges it faces in maintaining quality, it is an excellent subject for a thesis on quality management.



1. Figure: Business System of Eaton

Source: [PPT - Eaton Business System Overview PowerPoint Presentation, free download - ID:4836228 (slideserve.com)]

Significance of Quality Management in Businesses

A key element of any firm is quality management. All manufactured goods and services must adhere to strict quality and customer satisfaction requirements, which are ensured through quality management. By avoiding flaws and product recalls, enhancing customer happiness, and boosting productivity, quality management helps cut expenses. By offering a product or service that meets or exceeds consumer expectations, quality management also aids in maintaining a competitive advantage in the market. Moreover, quality management contributes to the effectiveness and efficiency of each process throughout the manufacturing cycle. Moreover, it aids in ensuring the effective and efficient use of all resources. Each company that wants to stay competitive in today's market needs to practice quality management. By using quality management, organizations may increase productivity, cut waste, and guarantee that their goods and services satisfy the needs and expectations of their customers.

It speaks of the procedures and controls put in place to guarantee that goods and services satisfy or even surpass consumer expectations. Businesses may maintain consistency in their processes, increase customer happiness, cut expenses, and boost profitability with the aid of quality management.

Here are some of the key reasons why quality management is important in businesses:

1. **Customer satisfaction:** The goal of quality management is to satisfy client expectations and demands. Businesses may increase client satisfaction and loyalty by making sure that their products and services are of a high caliber. Customers who are happy with a company are more likely to use the establishment again and refer it to others, which can boost sales and profits.

2. **Consistency:** A crucial component of quality management is consistency. Businesses may guarantee that goods and services are supplied at the same level each time by using consistent processes and procedures. Long-term success depends on establishing customer trust and reliability, which is made possible by doing this.

3. **Cost-reduction:** Quality management can help reduce costs by identifying inefficiencies in processes and systems. By eliminating waste, reducing defects, and improving efficiency, businesses can save money and improve profitability. By detecting waste in procedures and systems, quality management may aid in cost reduction. Businesses may save money and increase profitability by decreasing waste, minimizing defects, and enhancing efficiency.

4. **Competitive advantage:** Quality is a crucial differentiator in the cutthroat business world of today. Companies that regularly provide high-quality goods and services are more likely to distinguish themselves from the competition, draw in clients, and keep them as clients.

5. **Improved decision-making:** Businesses may utilize the information and insights provided by quality management to make more informed decisions. Businesses may find areas for improvement and implement changes that will have a favourable effect on customer happiness, profitability, and productivity by examining data on quality measures.

6. **Continuous improvement:** Continuous improvement is a key component of quality management. Businesses may find opportunities for improvement and implement changes to their operations by continuously monitoring and evaluating quality data.

In conclusion, quality management is crucial for companies to retain consistency, profitability, and customer pleasure. Businesses may cut expenses, gain a competitive edge, and constantly improve their operations by putting in place efficient quality management systems and procedures. In conclusion, quality management is crucial for companies to retain consistency, profitability, and customer pleasure. Businesses may cut expenses, gain a competitive edge, and constantly improve their operations by putting in place efficient quality management systems and procedures.

Purpose of the thesis

The purpose of this thesis is to explore the quality management practices employed by Eaton, a global provider of power management solutions, and how they are used to ensure customer satisfaction and product quality. This thesis will look at the various techniques Eaton employs, such as system monitoring and enhancement, device testing and inspection, employee training and certification, and customer feedback, to guarantee effective quality management. Correspondingly, this thesis will cover Eaton's quality management system improvement options as well as the opportunities and challenges it faces in managing quality. Subsequently, this thesis will investigate how quality management affects Eaton's overall effectiveness and financial success.

The purpose of the thesis, "Quality Management at Eaton Company," is to analyze Eaton Corporation's quality management system and its effects on business operations and performance. The goal of the thesis is to analyze the positive and negative aspects of Eaton's quality policy, contrast it with standard practices in the industry, and assess how it affects the company's performance.

The thesis will also investigate Eaton's struggles to maintain quality across all its international businesses and pinpoint areas for improvement.

The research will be guided by the following research questions:

1. *What is the current quality management system implemented by Eaton Corporation?*
2. *What are the strengths and weaknesses of Eaton's quality management system, and how does it compare to industry best practices?*
3. *What is the impact of Eaton's quality management system on its operational performance and customer satisfaction?*
4. *What are the challenges faced by Eaton in maintaining quality across its global operations, and how can these be addressed?*
5. *What are the opportunities for improvement in Eaton's quality management system, and how can these be leveraged to improve the company's performance?*

The thesis intends to provide Eaton Corporation along with other manufacturing businesses information and suggestions on how to develop and enhance their systems for quality management. The study is anticipated to advance the subject of operations management and add to the body of knowledge on quality management.

II. LITERATURE REVIEW

QUALITY MANAGEMENT OVERVIEW

Definition of Quality Management

Quality management is a thorough strategy for ensuring that products and services comply with or exceed consumer expectations is quality management. It entails creating, putting into place, and sustaining systems and procedures that concentrate on customer satisfaction and ongoing improvement. To keep consistency, dependability, and client endorsement in their operations, firms must maintain quality management, a crucial part of operations management.

Quality management involves a range of activities, including:

Setting up measurements and standards for quality: Quality management entails developing metrics and standards for gauging and tracking the calibre of goods and services. This might entail building methods to measure and monitor quality measurements, choosing important indicators of performance (KPIs), and setting quality goals.

Designing and executing quality systems and procedures is a key component of quality management because it guarantees that goods and services are delivered consistently and to a high level. This might entail creating quality assurance methods, setting up quality control procedures, and putting ISO 9001-style quality management systems into place.

Determining and resolving integrity issues: Quality management include determining and resolving quality issues, such as flaws, faults, or consumer complaints. This can entail determining the issue's core cause, taking corrective action, and then assessing how well it works. (Mehran Ebrahimi 2013)

Continuous improvement is the main goal of quality management to raise standards of excellence and client fulfilment over time. This entails tracking quality measurements, finding areas for development, and adjusting processes and outputs. (John C. Anderson 1994)

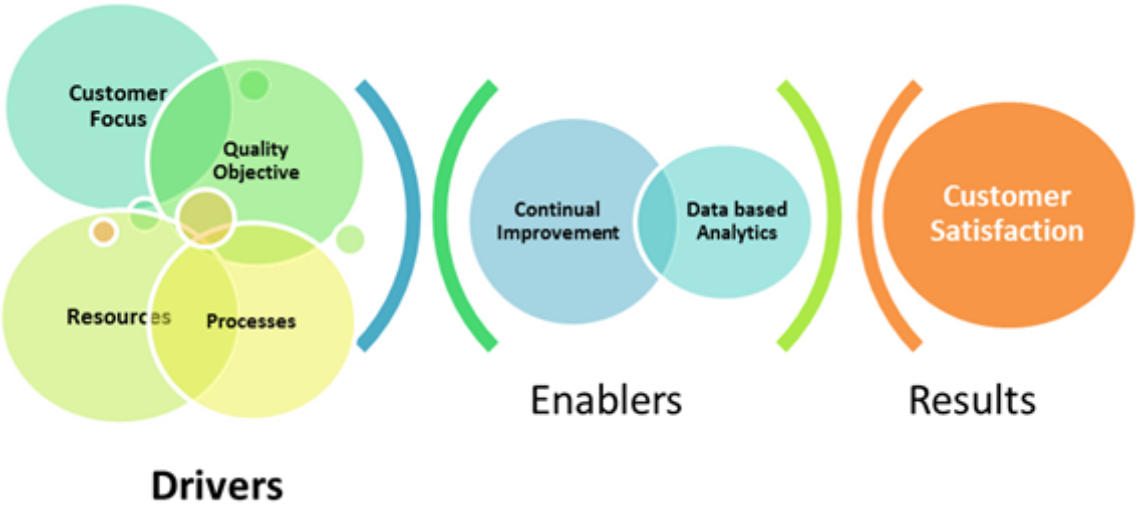
Some of the key benefits of quality management include:

- **Employee involvement:** All personnel inside the firm must be involved in quality management. This entails giving staff members the authority to spot problems with quality, offer comments, and participate in the process of continuous improvement.
- **Customer focus:** In the end, quality management is about providing products and services that meet or beyond consumer expectations. This entails being aware of

consumer demands, getting feedback from them, and implementing their suggestions to make changes.

- **Improved customer satisfaction:** Delivering products and services that surpass customer expectations can boost customer satisfaction and loyalty. This is the goal of quality management.
- **Increased efficiency and productivity:** Quality management may increase productivity and efficiency in firms by streamlining procedures and cutting waste.
- **Reduced costs:** Through the identification and elimination of waste, the reduction of defects, and increased efficiency, quality management may assist firms in cutting expenses.
- **Competitive advantage:** In a crowded industry, quality management may be a crucial distinction that makes companies stand out from the crowd and attract new clients.

In conclusion, quality management is a thorough strategy for guaranteeing that goods and services meet or surpass client expectations. It entails creating, putting into place, and sustaining systems and procedures that are centred on customer satisfaction and ongoing improvement. By putting quality first, businesses may increase customer happiness, cut expenses, and gain a market edge.



2. Figure: Benefits of quality management

Source: Quality Management Systems Synopsis - Smartgrid Electronics

History of Quality Management

The industrial revolution's development at the beginning of the 20th century and the requirement for manufacturing businesses to manufacture goods quickly and effectively are key turning points in the evolution of quality management.

The following are some key milestones in the history of quality management:

1. Frederick W. Taylor: Frederick W. Taylor created the scientific management concepts in the early 1900s, emphasizing the value of using information and data analysis to increase productivity and efficiency in manufacturing operations.

2. Quality Control: With Walter Shewhart's introduction of statistical quality control methods and W. Edwards Deming's advancements in sampling inspection techniques, quality control techniques started to take shape in the 1920s.

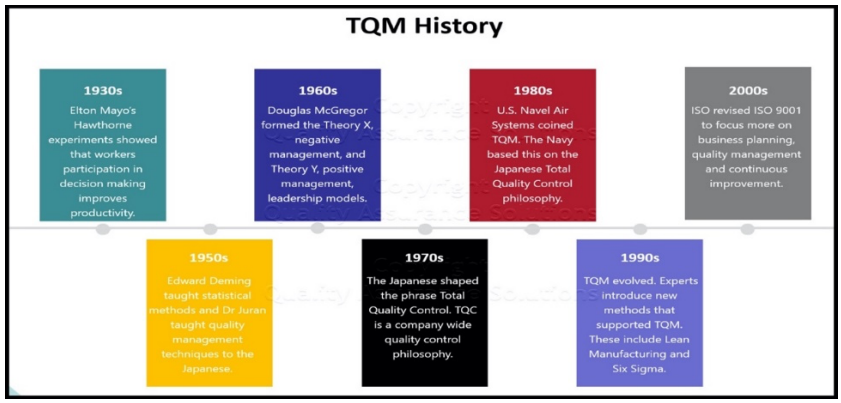
3. Total Quality Management (TQM): The idea of Total Quality Management (TQM), which aims to incorporate everyone on the team in quality management procedures and promote continuous improvement, started to take shape in the 1950s and 1960s. (Petersen 1999)

4. ISO 9000: The International Association for Standardization (ISO) created the ISO 9000 family of standards pertaining to quality management systems in the 1980s, and industrial organizations all over the world have since largely embraced them. (Olga Rodriguez-Arnaldo 2020)

5. Six Sigma: The Six Sigma approach for quality management was created by Motorola in the 1990s. It focuses on minimizing errors and variations in operations by conducting driven data analysis and improvement.

6. Lean Manufacturing: Lean Manufacturing, a concept that emphasizes the necessity of removing operations that do not add value to the finished product, arose in the 2000s as a means of decreasing waste in manufacturing processes.

In general, the evolution underlying quality management seems to be distinguished by an emphasis on enhancing productivity and efficiency in industrial processes, as well as by highlighting the significance of client satisfaction and ongoing development. Manufacturing organizations are constantly looking for methods to enhance the effectiveness of their quality management procedures and processes since it is now an essential part of operations management.



3. Figure: TQM History

Source: [TQM History. Article on the History of TQM. (quality-assurance-solutions.com)]

Quality Management Goals

Ensuring that goods and services continuously satisfy or exceed client expectations is the core objective of quality management. This entails creating, putting into place, and upholding systems and procedures that are centred on customer satisfaction and ongoing improvement.

Some specific goals of quality management include:

- **Consistency:** The goal of quality management is to guarantee that goods and services are continually produced to a high level. This entails locating and removing causes of discrepancies between processes and putting in place quality control methods to guarantee that goods or services adhere to the necessary standards.

- **Customer satisfaction:** Delivering goods or services that satisfy or beyond customer expectations is the goal of quality management. Understanding consumer demands, obtaining input from consumers, and utilizing that feedback to enhance product design, process development, and customer service are all necessary steps in this process.

- **Continuous improvement:** Continuous improvement is the main goal of quality management, which aims to raise standards of excellence and client fulfilment over the course of time. This entails tracking quality measurements, finding areas for development, and adjusting processes and outputs.

- **Efficiency:** By minimizing waste, increasing process efficiency, and lowering defect rates, quality management seeks to increase production and efficiency. This can aid companies in cutting expenses and boosting profitability.

- **Compliance:** Systems for managing quality are created to guarantee that goods and services adhere to industry norms and legal requirements. In order to do this, procedures for monitoring compliance must be established, and remedial measures must be put into place to handle any non-compliance concerns.

The general goals of quality management are primarily to enhance the calibre of products and processes, raise customer happiness, cut costs, and guarantee adherence to regulations and industry standards. Businesses may obtain a competitive edge and establish a reputation for providing high-quality goods and services by attaining these objectives. (Yvonne Lagrosen 2005)

The Procedure of Quality Management

Several processes make up the quality management process, all of which are intended to guarantee that goods and services satisfy both consumer demands and legal obligations. (Almaraz 1994)

The following is a general overview of the process of quality management:

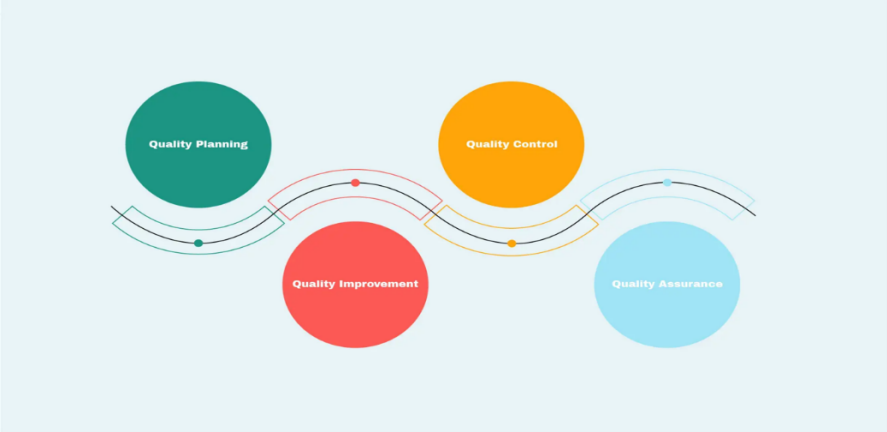
1. Establish Quality Objectives: The establishment of standards of excellence that are compatible with and in line with the overall purpose and vision of the firm is the first stage in the quality management process. Quality goals must be clear, quantifiable, doable, pertinent, and time-bound.

2. Develop Quality Standards: Following the establishment of quality objectives, quality standards that specify the requirements for the quality of products and services must be created. The interests of the consumer, legal regulations, as well as industry best practices should all form the foundation of quality standards.

3. Implement Quality Control: Monitoring the quality of goods and services to make sure they adhere to set criteria for quality is known as quality control. Finding opportunities for improvement may entail checking items, testing samples, or data analysis.

4. Implement Quality Assurance: Incorporating processes and procedures is part of quality assurance, which seeks to verify that quality requirements are continuously fulfilled over time. This might entail internal audits to find areas for improvement, educating personnel, or putting quality management tools into place.

5. Continuous Improvement: This includes recognizing the potential for improvement and making changes to improve the quality of products and services, which is the last phase in the quality management process. Implementing new procedures or technologies, getting customer feedback, or doing root cause analyses to pin down the main reasons for quality problems are all examples of continuous improvement.



4. Figure: Quality Management Process

Source: Definition, components and process of quality managment - SlideBazaar Blog

Overall, the goal of the quality management process is to minimize risk while ensuring that goods and services satisfy consumer expectations and legal and regulatory requirements. Companies may enhance the quality of their products and services, boost customer happiness, and keep a competitive edge in the market by adopting a structured approach to quality management. (Jayant V. Saraph 1989) (Enrique Claver 2021)

Methods, Techniques, and Tools used in Quality Management

To make sure that goods or services comply with or exceed consumer expectations, quality management approaches, techniques, and technologies are employed. (Masood A. Badri 1995)

Here are some common methods, techniques, and tools used in quality management:

- **Statistical process control (SPC):** SPC is a technique for applying statistical techniques to monitor and manage a process. Data on how well the process works must be gathered and any deviations must be found and fixed using statistical analysis.

- **Failure mode and effects analysis (FMEA):** FMEA is a method for spotting possible flaws in a result or system and evaluating their effects. It entails identifying probable failure mechanisms, gauging the impact of the collapse, and coming up with solutions to stop or lessen it.

- **Root cause analysis (RCA):** RCA is a technique for figuring out what caused a glitch or failure in the first place. It entails gathering information about the issue or failure, analyzing that information to find probable reasons, and taking remedial action to stop the issue from happening again.

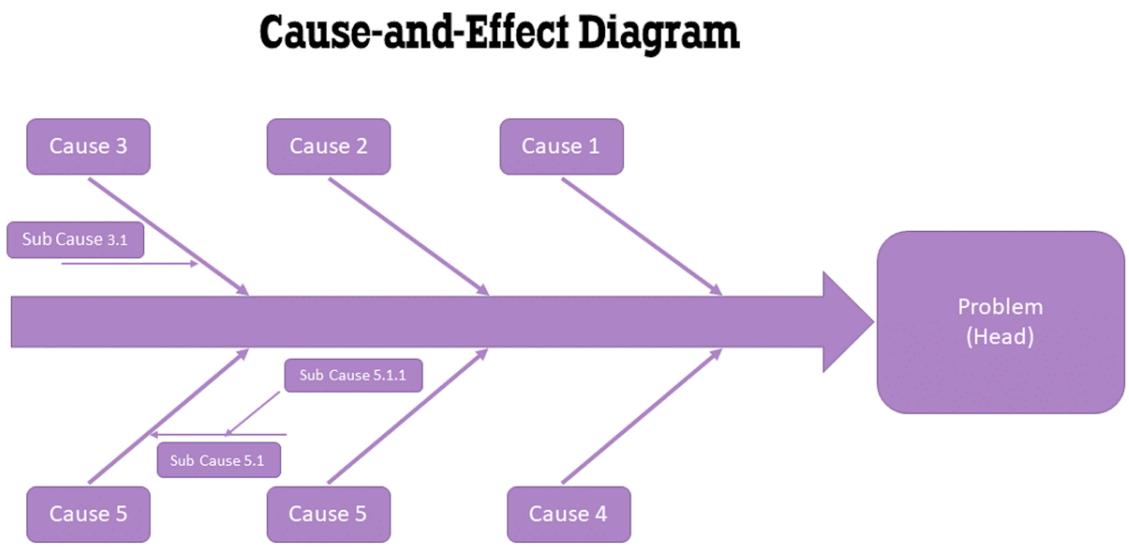
- **Design of experiments (DOE):** DOE is a method of statistical analysis for enhancing the design of a product or process. It entails finding important variables that influence how well a product or process performs and utilizing statistical techniques to adjust these variables such that the performance is as intended.

- **Lean Manufacturing:** Waste Removal in manufacturing processes is a key component of the lean manufacturing concept. This entails locating and removing processes like surplus stock, overproduction, and flaws that have no added value to the finished product.

- **Six Sigma:** Six Sigma is a data-driven quality management strategy with an emphasis on lowering errors and process variability. It entails using a systematic approach to problem-solving while utilizing statistical approaches and tools to locate and get rid of process variation causes.

- **Total Quality Management (TQM):** TQM is an all-inclusive method of quality management that includes everyone who works for a firm, from top management to front-line staff. Continuous improvement, customer happiness, and staff engagement in quality management procedures are all stressed in TQM.

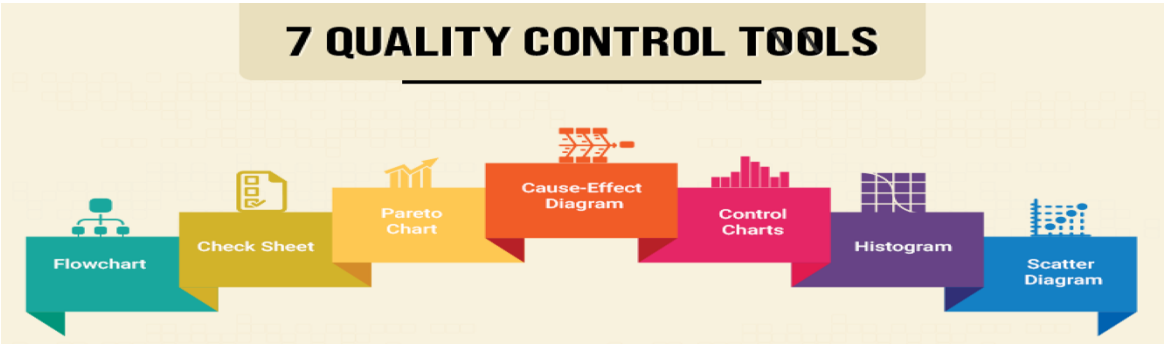
- **ISO 9001:** The quality management system standard ISO 9001 outlines the conditions for the creation, use, and upkeep of systems for quality management. It is intended to assist firms in making sure that their goods and services continually satisfy consumer needs and legal obligations.



5. Figure: Cause and Effect diagram

Source: Quality Control Data Representation Tools • MilestoneTask

In general, quality management strategies, tools, and procedures are used to enhance the quality of products and processes, lower waste and shortcomings, and guarantee customer satisfaction. Manufacturing businesses may enhance their operations and get a competitive edge in the market by utilizing these strategies.



6. Figure: Quality control tools

Source: 7 QC Tools You Should Know About in 2021 - Talent Economy (shine.com)

The relationship between Performance, Productivity, and Quality Management

People thought quality and production were unrelated throughout the initial half of the 20th century. Nevertheless, consumers gradually learned that Japanese companies had implemented quality as a management strategy that helped enhance quality and productivity and cut costs by minimizing waste. This was after Japanese autos and entertainment products dominated the American market. Since then, quality management tools have been used by all businesses in developing nations. Additionally, it was discovered that quality has a direct or indirect impact on the efficiency and expense of goods, proving the relationship between quality and productivity.

In manufacturing firms, productivity, performance, and quality management are closely related. The goals of quality management procedures are to promote customer happiness, decrease inefficiency and defects, and improve the quality of processes and products.

Many researchers define Productivity, which refers to finished goods that are prepared for sale on the market, is often defined by academics as the proportion of the overall product amount to the total input amount. Additionally, productivity refers to both individual and organizational performance effectiveness. (P. George Benson 1991)

Productivity = Output / Input

Quality can also be defined through a formula:

Quality = Performance of product/Expectation of customers (Q = P/E)

Q is quality, P is the performance of the product, and E is the expectation of the customer. So, when:

1. When P > E, then the quality of the product is very good.
2. When P = E, then the quality of the product is satisfactory.
3. If P < E, then the quality of the product is poor.

Performance level influences the connection between productivity and quality, higher performance influences both productivity and quality. We might say that these ideas represent alternative ways of measuring the degree of performance of a manufacturing system.

The correlation, especially between quality and productivity, is demonstrated in the below figure.

7. Figure: Objectives of quality

Source: Quality and Productivity PowerPoint Template (sketchbubble.com)

Quality management approaches result in increases in the efficiency of processes, client fulfilment, staff participation, and continuous improvement. Overall, there is a significant association between the management of quality, productivity, and performance. Manufacturing organizations may increase efficiency and performance while providing their clients with high-quality goods and services by putting into place efficient management of quality systems and procedures. (Tarí 2005)

The Cost of Quality

The cost of quality is a tool for gauging how well a company is doing with quality, and it also has something to do with quality failures.

The cost of quality is calculated as follows:

$$\textbf{\textit{Cost of Quality}} = \textbf{\textit{P C}} + \textbf{\textit{A C}} + \textbf{\textit{IFC}} + \textbf{\textit{EFC}}$$

The expense incurred to guarantee that goods or services satisfy or exceed consumer expectations is known as the cost of quality. Costs for preventing flaws, evaluating the quality of the product, and fixing existing problems are all included.

The following are the four primary categories of costs of quality:

1. Prevention Costs: These are the expenses paid to avoid having any problems in their initial place. Examples include the price of quality planning, personnel training, putting quality systems in place, and creating error-free procedures.

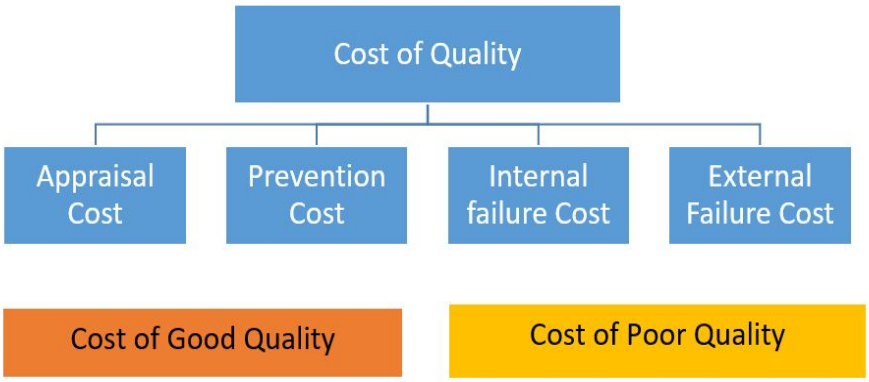
2. Appraisal Costs: These are the expenses incurred to gauge and assess the calibre of an item or service. Examples include the price of audits, tests, and inspections.

3. Internal Failure Costs: These are the expenses incurred when flaws are found and fixed before a product or service is offered to the client. The price of repair, scrap, and rework are a few examples.

4. External Failure Costs: These expenses are incurred when the consumer discovers flaws after the good or service they bought has been executed. The price of claims for warranty, product recalls, and consumer complaints are a few examples.

Quality may be expensive; according to some estimates, it can cost as much as 25% of an organization's whole revenue. However, spending money on quality may have a big payoff in terms of better customer satisfaction, more effective processes, and lower expenses for warranty claims and product recalls.

Manufacturing organizations may lower the cost of quality and increase their bottom line by putting in place efficient quality management systems and procedures. This entails making investments in preventative measures to stop faults before they start, enhancing the design of products and processes to lower the chance of defects, and putting in place efficient quality control methods to find and fix flaws as soon as they appear.



8. Figure: Cost of Quality

Source: [Cost of Quality in Garment Manufacturing and Its Calculation Method (onlineclothingstudy.com)]

The Advantages and Limitations of Implementing a Quality Management

Advantages of Quality Management Implementation:

- **Improved customer satisfaction:** The goal of quality management systems is to meet or exceed the demands of customers, which can increase client loyalty and satisfaction.
- **Increased efficiency and productivity:** Quality management systems may increase productivity and efficiency in firms by streamlining procedures and cutting waste.
- **Reduced costs:** By identifying and removing waste, lowering faults, and boosting efficiency, quality management systems may assist firms in cutting expenses.
- **Competitive advantage:** In a crowded market, quality management systems may be a crucial difference that enables firms to stand out from the crowd and attract new clients.
- **Improved decision-making:** With the help of quality management systems, choices concerning the development of products and processes, quality assurance, and continuous improvement may be made with more knowledge.
- **Employee engagement:** Increased motivation, work satisfaction, and productivity can result from including employees in the quality enhancement procedure thanks to quality management systems.

Limitations of Quality Management Implementation:

- **Resistance to change:** A quality management system's implementation necessitates a considerable shift in how firms run, which may be greeted with opposition from both management and staff.
- **Resource constraints:** An extensive amount of time, money, and staff may be needed to implement a quality management system.
- **Lack of understanding or commitment:** All organizational levels must be fully committed to quality management systems; failing to do so might result in a lack of support and ineffective system implementation.
- **Complexity:** A variety of procedures, instruments, and measurements are used in the implementation of a quality management system, which might be complicated.
- **Integration with existing systems:** Integration of quality management systems with current procedures and systems might be difficult if they are out-of-date or incompatible.
- **Maintenance and sustainability:** For quality management systems to be successful and durable over the years, they need constant upkeep and attention. (Greatbanks 2005)

9. Figure: Implementing the quality management system

Source: https://www.smartgridelectronics.net/quality-management-systems-synopsis/

Reducing expenses, boosting efficiency and productivity, gaining a competitive edge, making better decisions, and increasing employee engagement are all advantages of implementing quality management. A quality management system must be implemented, but there are many obstacles to overcome, such as resistance to change, resource limitations, a lack of knowledge or determination, complexity, integration with current systems, maintenance and sustainability. (Singh 2012)

TOTAL QUALITY MANAGEMENT EVOLUTION

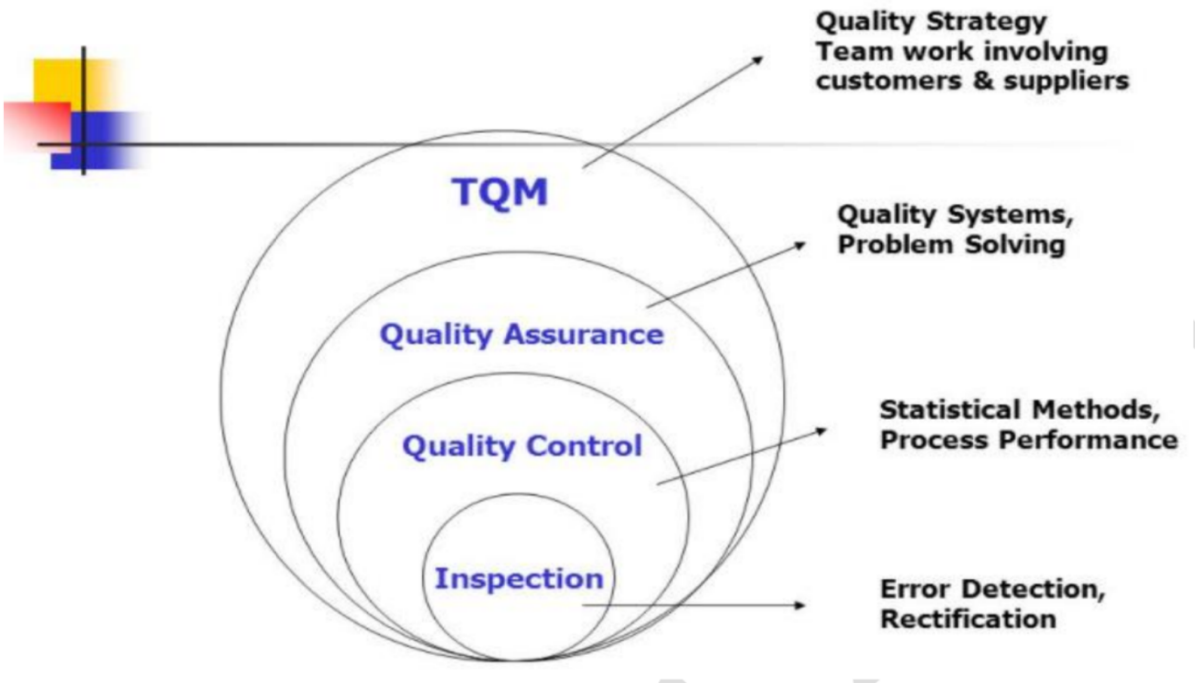
A management concept known as total quality management (TQM) places a strong emphasis on the value of incorporating all employees in the process of quality management and fostering continual improvement. With the advent of quality control techniques in the industrial sector in the first decades of the 20th century, TQM began to take shape. (Tarí 2005) (Black 2010)

The following is a more detailed explanation of the evolution of TQM:

- **Quality Control:** Quality control techniques started to appear in the first decades of the 20th century with the aim of finding and fixing flaws in production procedures. These techniques included sample inspection and statistical process control.

- **Quality Assurance:** The idea of quality assurance first came into existence in the 1960s as a means of ensuring that goods or services matched or even beyond consumer expectations. Setting up processes and standards for quality was necessary to guarantee

that goods and services were consistently produced in accordance with those standards. (Topalović, 2015)



10. Figure: Evaluation of TQM

Source: https://www.slideserve.com/phong/total-quality-management-tqm

- **Total Quality Control:** To include all personnel in quality management operations, the idea of complete quality control first surfaced in the 1970s. This involves encouraging continuous improvement across the whole business and giving staff the authority to recognize and address quality concerns.

- **Total Quality Management (TQM):** The idea of total quality management, which aims to include quality control in all facets of an organization's activities, developed in the 1980s. Customer satisfaction, ongoing development, and staff participation in quality management processes were all stressed by TQM.

- **Business Process Reengineering:** company process reengineering is a concept that arose in the 1990s with the goal of redesigning company processes to increase effectiveness and quality. This involves a comprehensive strategy for process optimization with the goal of streamlining operations throughout the whole company.

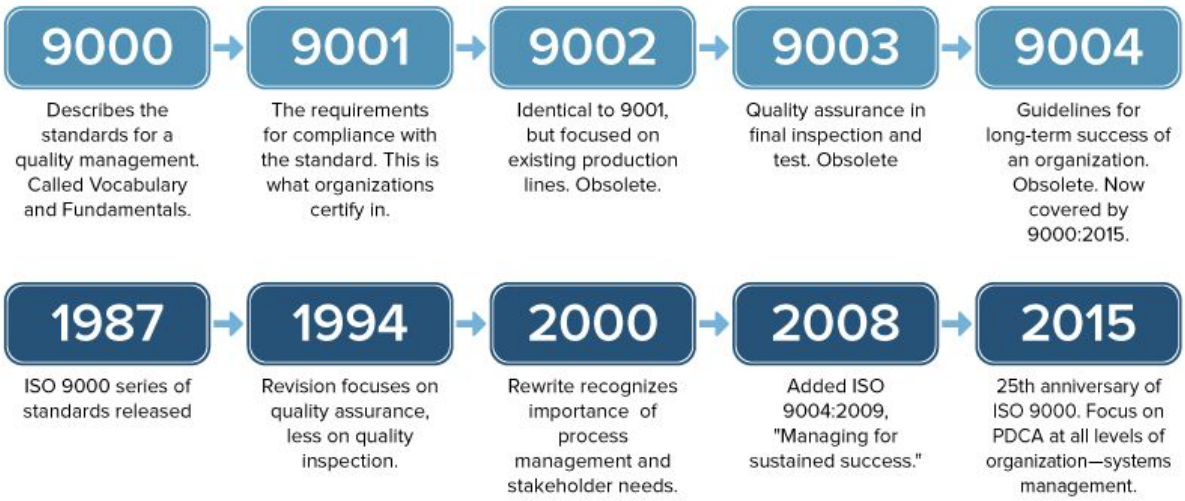
- **Six Sigma:** The idea of Six Sigma evolved as a data-driven strategy for quality management in the 2000s. Through statistical techniques and data analysis, Six Sigma focused on lowering errors and variability in processes. (Wilkinson 2010)

1. Table: Quality Management Stages

Quality Management Stages	Areas of Focus	Scope
Inspection	Detection	Error detection Rectification Sorting, grading, reblending Decision about salvage and acceptance
Quality Control	Maintaining status quo	Quality standards Use of statistical methods Process performance Product testing
Quality Assurance	Prevention	Quality system (ISO 9000) Quality costing Quality planning and policies Problem-solving Quality design
Total Quality Management	Quality as a strategy	Quality strategy Customers, employees and suppliers involvement Involve all operations Empowerment and teamwork

The focus on including every worker in quality management operations, promoting continuous improvement, and incorporating quality management in all facets of an organization's operations have generally been characteristics of TQM's progress. TQM is still a crucial part of operations management today, and manufacturing businesses are constantly looking for methods to enhance their quality control procedures and systems. (Spencer 1994) (Jens J. Dahlgaard 2019)

ISO 9000 STANDARDS EVOLUTION



11. Figure: Evolution of ISO

Source: https://multiglobalunity.com/sistem-manajemen-mutu-bagi-industri-otomotif/

What Is ISO 9000 vs. ISO 9001?

There are variations between ISO 9001 and ISO 9000, two international standards for quality management systems that are sometimes used interchangeably.

The ISO 9000 series of standards include terminology and principles for quality management systems. Organizations can use the ISO 9000 standards as a framework to set up and operate a quality management system.
The ISO 9000 collection of requirements consists of a widespread referred to as ISO 9001 that outlines the specs for coping with nice systems. Organizations may use the principles provided by ISO 9001 to develop and continuously operate a system for quality control that satisfies both customer expectations and legal obligations.

In other words, ISO 9000 gives a general overview of the concepts and language surrounding quality management systems, whereas ISO 9001 specifies the guidelines that enterprises must adhere to in order to set up and sustain a system for managing quality.

While ISO 9001 serves as the foundation for certification by a third-party certifying authority, ISO 9000 is frequently used as a source of information for enterprises that are putting in place a quality management system.

In general, ISO 9001 and ISO 9000 are significant guidelines for quality control systems and are frequently used in tandem. Organizations may enhance their systems for quality management and better serve their customers by adhering to the rules and recommendations described in these standards. (Priede 2012)

The ISO 9001 Guidelines

The principles of ISO 9001 are a set of guidelines that organizations can follow to implement and maintain a quality management system that meets customer needs and regulatory requirements.

The following are the seven principles of ISO 9001:

- **Customer focus:** Businesses should prioritize fulfilling client demands and surpassing their expectations. This entails comprehending client needs, obtaining input from customers, and using their feedback to improve the design of products, process design, and service to customers.

- **Leadership:** Top-level management is responsible for leading the organization and fostering a culture of excellence. To do this, a quality policy must be established, along with quality goals and staff participation in quality management tasks.

- **Engagement of people:** To promote continual development, all staff should be involved in quality management initiatives. This entails offering chances for training and growth, honouring staff members' contributions to quality control, and fostering a culture of cooperation and teamwork.

- **Process approach:** To optimize processes across the board, organizations should take a process-centred approach to quality management. Increasing the effectiveness and efficiency of processes entails locating and removing the causes of ineffectiveness and waste as well as putting improvement efforts into place continuously.

- **Improvement:** Continuous improvement should be a priority for businesses if they want to gradually raise quality standards and boost consumer happiness. This entails tracking quality measurements, finding areas for development, and making adjustments to processes and outputs.

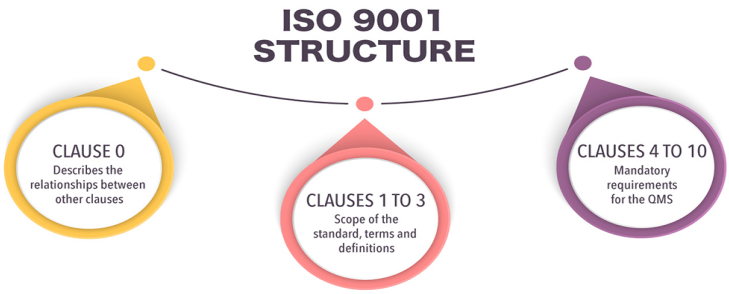
- **Evidence-based decision-making:** To promote continuous development and guarantee that services and goods meet or exceed consumer expectations, organizations should base their decisions on data and analysis. Making informed judgments entails gathering and analysing data on the performance of products and processes.

- **Relationship management:** To foster a culture of cooperation and ongoing development, organizations should manage their interactions with vendors and other stakeholders. This entails creating lines of contact with suppliers, keeping an eye on their performance, and collaborating with them to create advancements in the quality of goods and operational effectiveness.

12. Figure: ISO 9001

Source: [ISO 9001 - ISO 9001 Certificate - ISO Consulting and Certification (isohelp.ir)]

In general, the ISO 9001 principles offer a framework for businesses to adhere to in order to establish and uphold a system for quality management that satisfies both customer expectations and legal obligations. Organizations may enhance the quality of their processes and products, boost customer happiness, and acquire a competitive edge in the market by adhering to these principles. (Shahin 2004)



13. Figure: ISO 9001 structure

Source: [What are the basic ISO 9001 requirements and structure? (advisera.com)]

History, Standards, and Versions

History:

The International Organization for Standardization (ISO) initially released the ISO 9000 family of standards in 1987. The series was created in recognition of the demand for an international standard for the management of quality that enterprises from all over the globe could adopt.

Three standards made up the initial iteration of the ISO 9000 series: ISO 9001, ISO 9002, and ISO 9003. Later, these standards were updated and combined to become ISO 9001, the ISO 9000 standard that has received the most recognition. (Albert Weckenmann 2015)

Standards:

A collection of standards for the management of quality systems is part of the ISO 9000 series. The standards offer a framework for businesses to set up and operate a quality control system that complies with legal obligations.

The ISO 9000 collection consists of the subsequent standards:

- **ISO 9000:2015 -** Quality management systems – Fundamentals and vocabulary.
- **ISO 9001:2015 -** Quality management systems – Requirements.
- **ISO 9004:2018 -** Quality management – Quality of an organization – Guidance to achieve sustained success.

14. Figure: Foundation of standard

Source: [ISO Standards in Action (greenprojectmanagement.org)]

Versions:

Since its original publication in 1987, the ISO 9000 family of standards has gone through several changes.

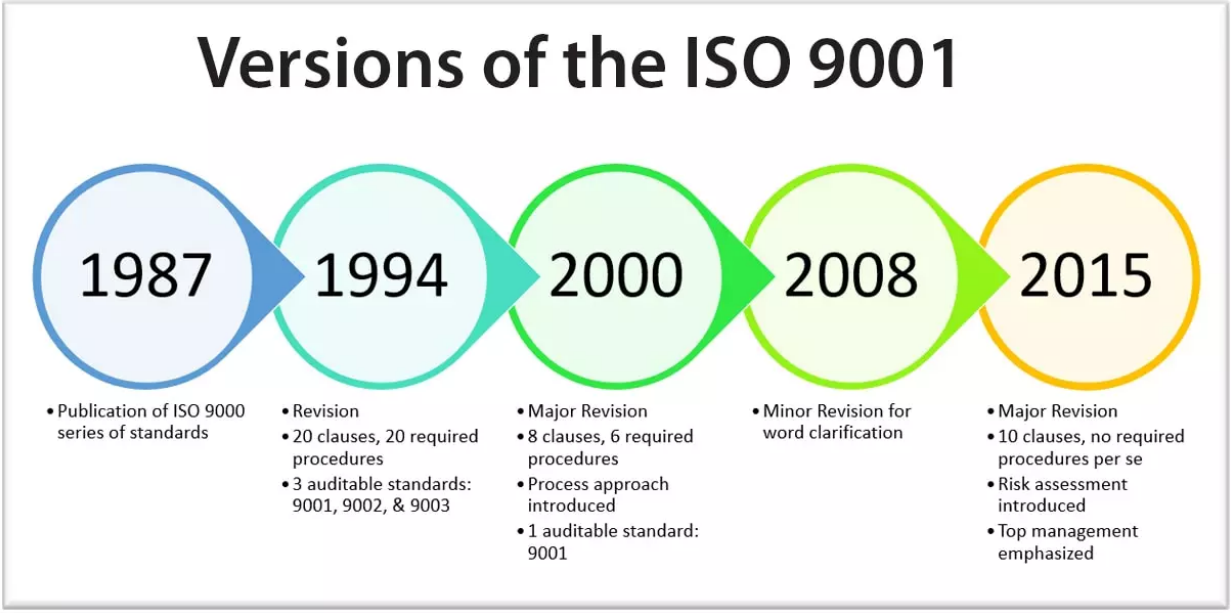
The following are the major versions of the ISO 9000 series:

- **ISO 9000:1987 -** The first version of the ISO 9000 series, which included three separate standards: ISO 9001, ISO 9002, and ISO 9003.
- **ISO 9000:1994 -** The second version of the ISO 9000 series, which combined the three separate standards into a single standard: ISO 9001.

- **ISO 9000:2000 -** The third version of the ISO 9000 series, which introduced a more customer-focused approach to quality management.

- **ISO 9001:2008 -** A revision of the ISO 9001 standard, which introduced a more process-based approach to quality management.

- **ISO 9001:2015 -** The current version of the ISO 9001 standard, emphasizes the importance of risk-based thinking, leadership, and stakeholder engagement.



15. Figure: Versions of the ISO 9001

Source: [What is the ISO 9001 standard? A straightforward overview (advisera.com)]

Over the years, the ISO 9000 family of standards endured a number of updates, each of which attempted to enhance the structure of quality assurance systems and better serve businesses' and their clients' needs.

ISO Standards for Specific Industries

Numerous industry-specific ISO standards additionally to the ISO 9000 series offer guidance for quality assurance systems in certain sectors. These standards offer a framework for enterprises to set up and uphold quality management procedures that satisfy industry-specific criteria and are created to address the demands and problems of various industries.

The following are some examples of industry-specific ISO standards:

1. **ISO 13485:** This standard, Medical Devices - Quality Management Systems, offers recommendations for the management of quality procedures in the medical device sector. It is utilized by medical device makers, suppliers, and regulatory organizations all around the world and covers the creation, creation, production, and implementation of medical devices.

2. **ISO/TS 16949:** Automobile management of quality systems: This standard lays forth requirements for quality control measures in the sector. The planning, research, manufacturing, and implementation of automotive items are all covered by it, and it is employed by global automotive suppliers and manufacturers.

3. **ISO 14001:** This standard offers standards for environmental control systems across various sectors. It involves pollution prevention, environmental law compliance, and management of environmental elements. Organizations all across the world utilize it to control their environmental effect.

4. **ISO 22000:** Standards for management systems for food safety are provided by this standard for the food and beverages sector. It is utilized by food producers, suppliers, and regulatory bodies all around the world and covers the manufacturing, interaction with, and distribution of food items.

5. **ISO/IEC 27001:** Systems for managing information security: This standard outline best practices for systems to handle information security across various industries. It addresses the handling of information security threats, the application of security measures, and the safeguarding of private data. Organizations all around the world use it to control their information security threats.

Overall, sector-specific ISO standards give businesses a framework for setting up and maintaining management systems for quality that adhere to industry norms. Organizations may enhance the quality of their processes and products, boost customer happiness, and achieve a competitive edge in their sector by adhering to these standards.

III. RESEARCH

Company Profile

Eaton Corporation History

With its headquarters in Dublin, Ireland, Eaton Corporation provides a global power management firm with operations in more than 175 nations. By Joseph Eaton and Viggo Torbensen, the business was established in the United States in 1911.

The following is a more detailed history of Eaton Corporation:

From 1911 until the 1930s: Eaton Corporation was established in Bloomfield, New Jersey as the Torbensen Gear and Axle Company. The commercial enterprise produced axles in particular for vans and different vehicles. The business increased the scope of its product offering in the 1930s to incorporate steering systems, gearboxes, and other car parts.

The 1940s–1960s: Eaton Corporation was a key player in the war effort during the second world conflict by supplying parts for combat vehicles and aeroplanes. After the end of the conflict, the business kept expanding and growing, buying a number of businesses in the aerospace and automotive industries.

The 1970s through the 1990s*:* In the years between the 1970s and the early 1980s, Eaton Corporation diversified into new industries such as industrial automation, hydraulics, and electrical power management. Additionally, the business established subsidiaries in the Asia-Pacific region, Europe, and Latin America as part of its worldwide expansion. Eaton Corporation expanded through acquisitions in the 1990s, notably the purchase of Aeroquip-Vickers, a renowned producer of hydraulic equipment and parts.

2000s-Present: Early in the new millennium, Eaton Corporation began to broaden its product offering by creating hybrid powertrains for commercial vehicles. The business relocated its corporate office to Dublin, Ireland, in 2012, and it started concentrating more on handling power and energy-saving technology. Eaton Corporation is a market pioneer in energy management solutions today, concentrating on assisting clients in managing and preserving mechanical, hydraulic, and electrical power. To address the changing demands of its clients, the organization continues to develop and make investments in new technology.

Vision Statement of Eaton

The mission of Eaton Corporation is "to enhance the standard of human existence and sustainability by means of the implementation of energy management technology and services." The company's dedication to utilising its knowledge of power management to improve society and ecological health is emphasized in the vision statement. Products and

services from Eaton Corporation are made to assist clients in managing and conserving electricity, cutting back on energy use, and minimizing the environmental effect of their operations. Eaton Corporation seeks to significantly improve the standard of living and safeguard ecosystems for future generations by concentrating on power management technology and services.

Mission Statement of Eaton

The goal statement of Eaton Corporation reads, "We convey ecologically friendly options that help individuals and businesses successfully handle electrical power, hydraulic, and mechanical energy - more securely, more effectively, and more reliably." The company's concentration on offering viable options to its clients, with a focus on safety, effectiveness, and dependability, is emphasized in the mission statement. Products and services from Eaton Corporation are intended to assist clients in managing and conserving electricity while lowering risk and increasing uptime. Eaton Corporation seeks to develop lasting partnerships and add value for all stakeholders by offering sustainable solutions that satisfy its customers' changing demands.

16. Figure: Eaton Mission Statement

Source: Eaton's quality statement

Core Values of Eaton

Eaton Corporation's core values are:

1. Integrity: The business is dedicated to operating with honesty, integrity, and openness. This entails upholding moral principles, abiding by regulations and laws, and handling all stakeholders fairly.

2. Respect: Eaton Corporation is dedicated to fostering an environment where all workers receive treatment with respect and dignity and support diversity and inclusion. This involves promoting a climate of cooperation, teamwork, and respect.

3. Accountability: Customers, workers, stockholders, and the community are just a few of the stakeholders to whom the business is accountable. Setting high criteria for performance and aiming for constant improvement fall under this category.

4. Innovation: The Eaton Corporation is dedicated to creating new and improved solutions to satisfy its clients' changing demands. The company is dedicated to innovation and continual development.

5. Sustainability: The business is devoted to sustainability and to reducing its negative effects on the environment while generating advantages for its stakeholders. This entails creating environmentally friendly goods and solutions, cutting down on emissions and waste, and supporting green practices across all aspects of business operations.

17. Figure: Material Issues

Source: [What is Material Management? (Definition, Types and Examples) - TWI (twi-global.com)]

The overall dedication of Eaton Corporation to acting with credibility, respecting all stakeholders, taking responsibility for its activities, supporting innovation, and advancing sustainability is reflected in the company's fundamental principles. These principles serve as the company's decision-making framework and foster a culture of excellence and ongoing development.

Organizational chart for Eaton Corporation

Using data that is readily available to the public, an overview of the organizational structure of Eaton Corporation. The Eaton Corporation is divided into several business categories, each of which is in charge of a certain line of goods or scope of services.

The company's business segments include:

1. Electrical Products: Electrical appliances, switching equipment, and distribution of electricity equipment are just a few of the many electrical items manufactured in this sector.

2. Electrical Systems and Services: For business, commercial, and residential applications, this section offers electrical engineering products and advisory services, as well as electrical equipment and systems.

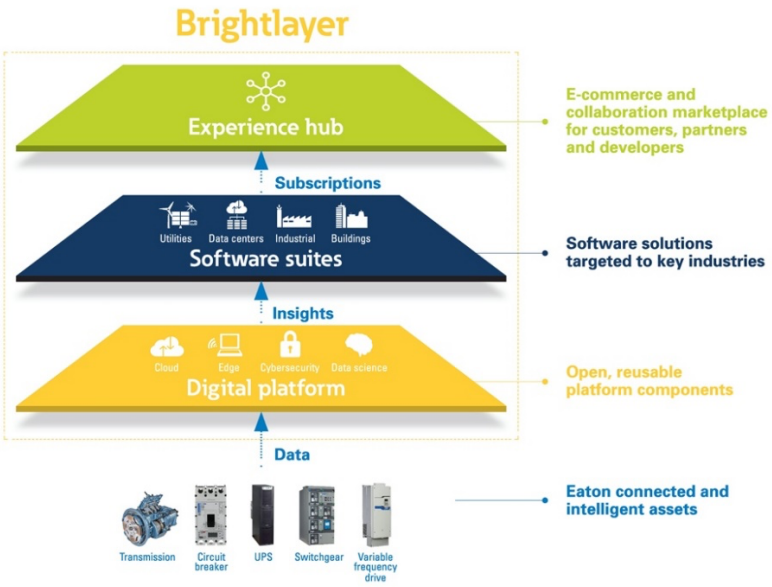
3. Hydraulics: This business area manufactures hydraulic pumping engine valves and cylinders for mobile and industrial applications.

4. Aerospace: For both commercial and military aircraft, this category manufactures hydraulic in nature, fuel, and pneumatic equipment and components.

5. Vehicle: Transmissions, which are clutches, and differentials are among the transmissions and powertrain components made by this industry segment for commercial vehicles.

6. eMobility: This market category creates electromagnetic and hybrid power sources for commercial vehicles, such as battery management and charging systems for electric cars.

Each business sector of Eaton Corporation is targeted at a particular market or product line, and the organization is built to serve its diverse array of goods and services.



18. Figure: Eaton structure

Source: [Electrical and Industrial | Power management solutions | Eaton]

Analysis and Discussion

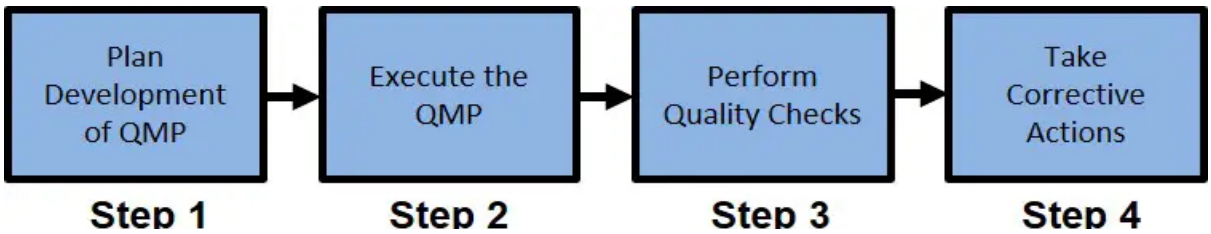
Overview of the Quality Management System at Eaton Company

Eaton Corporation, an international power management firm, has a thorough quality control system in place to make sure that its goods and services satisfy clients' expectations and legal requirements. The ISO 9001 standard, which offers standards for quality management systems, is the foundation of the organization's quality management system.

The following is an overview of Eaton Corporation's quality management system:

- **Customer Focus:** Eaton Corporation is dedicated to surpassing customers' expectations and satisfying their needs. The business leverages consumer input to enhance customer service, process design, and product design.
- **Leadership:** Leadership is provided by top-level management, which also fosters a culture of excellence inside the company. The quality policy of Eaton Corporation emphasizes the organization's commitment to continual improvement and sets a standard for quality management.
- **Process Approach:** To optimize processes throughout the whole business, Eaton Corporation employs a process-based approach to quality management. Increasing the effectiveness and efficiency of processes entails locating and removing the causes of ineffectiveness and waste as well as putting improvement efforts into place continuously.

- **Continuous Improvement:** Eaton Corporation is dedicated to constant innovation to raise the bar for quality and client satisfaction throughout time. The business evaluates and tracks quality measurements, spots opportunities for improvement, and adjusts enhance both processes and goods.
- **Evidence-Based Decision Making:** To promote continuous development and guarantee that products and services comply with or exceed consumer expectations, Eaton Corporation bases its choices on data and analysis. The business gathers and examines information about the effectiveness of its processes and products, and then utilizes that information to make choices.
- **Risk-Based Thinking:** A based-on-risk strategy for quality management is used by Eaton Corporation to identify and reduce risks that might have an influence on the quality of the product or customer satisfaction. The business conducts risk assessments to detect possible threats and put measures in place to lessen those threats.



19. Figure: Quality Management Plan Methodology steps

In summary, Eaton Corporation's quality management system is built to promote continuous improvement, reduce risk, and guarantee that its goods and services satisfy customer expectations and legal requirements. Eaton Corporation may preserve the tradition of quality and continually improve its goods and services by adhering to the rules and specifications of the internationally recognized ISO 9001 standard.

Strengths and weaknesses of the system

Strengths:

1. Customer Focus: The quality management system of Eaton Corporation was created with a heavy emphasis on the demands of the customer, ensuring that the company's goods and services satisfy those needs and expectations.

2. Leadership: Top-level management of the firm offers effective leadership and is dedicated to fostering a culture of excellence throughout the whole organization.

3. Process Approach: The process-driven method of quality management used by Eaton Corporation assists in locating and eliminating the causes of inefficiencies and waste, which can enhance product quality and result in cost savings.

4. Continuous Improvement: Due to the company's emphasis on continuous development, it always seeks to enhance its goods and services, which can increase client happiness and loyalty.

5. Risk-Based Thinking: The risk-based method of quality management used by Eaton Corporation assists in identifying possible hazards and putting controls in place to reduce the risks, which can enhance product safety and dependability.

Weaknesses:

1. Complexity: The quality management system at Eaton Corporation can be complicated, which makes it challenging for certain personnel to comprehend and use.

2. Cost: For some firms, the expense of setting up and sustaining a system for managing quality might be a barrier.

3. Resistance to Change: The implementation of continuous improvement efforts may be challenging since particular staff members may be resistant to modifications in processes or procedures.

4. Lack of Standardization: Lack of consistency in quality management standards may result in inconsistent product quality if Eaton Corporation has different locations or business divisions.

5. Focus on Compliance: The quality management system at Eaton Corporation could put too much focus on adhering to rules and regulations, which might stifle creativity and creative thinking in product development.

In comparison to best practices in the Industry

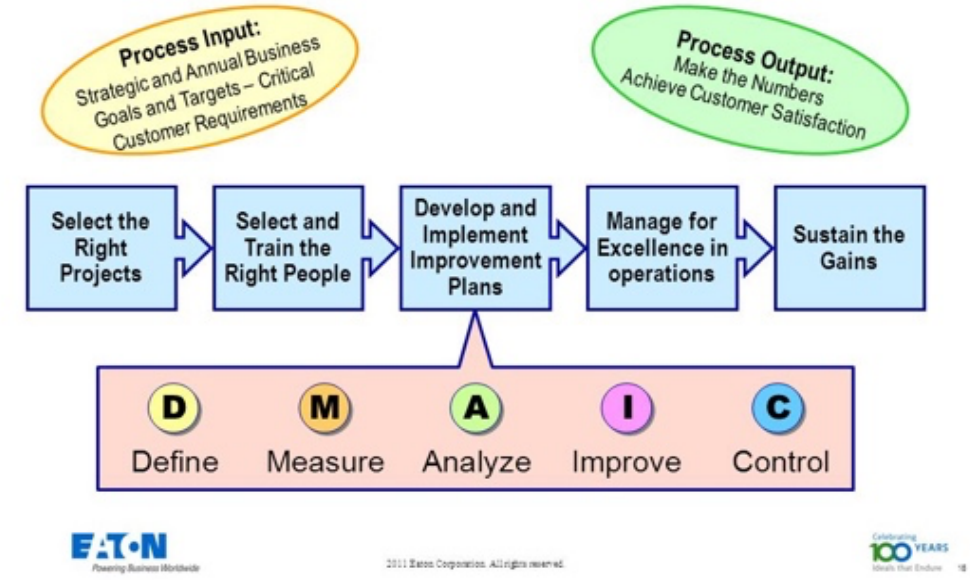
The ISO 9001 standard, a widely accepted benchmark for quality management systems, serves as the foundation for Eaton Corporation's quality management system. The Eaton Corporation's quality management system provides a number of advantages above industry best practices, which might involve a strong customer focus, a process-based methodology, and an emphasis on continuous improvement.

To ensure excellence in quality management, some industry professionals contend that the standard established by ISO 9001 is insufficient and that other frameworks or standards could be required.

Some examples of industry best practices in quality management include:

- **Total Quality Management (TQM):** Continuous improvement, stakeholder engagement, and customer focus are all emphasized in the holistic approach to quality management known as TQM. Process leadership, empowerment of staff members, and customer feedback are just a few of the numerous methods that make up TQM.

- **Six Sigma:** A data-driven quality management strategy called Six Sigma places a strong emphasis on lowering errors and process variability. For the purpose of locating and eliminating causes of waste and inefficiency, Six Sigma employs statistical techniques and tools.



20. Figure: Six Sigma

Source: https://www.slideserve.com/irisa/eaton-business-system-overview

- **Lean Manufacturing:** Lean manufacturing, on the other hand, is a method of quality control that places a strong emphasis on waste reduction and process improvement. Numerous techniques are used in lean manufacturing, such as mapping processes, stream of value evaluation, and continuous improvement.

	Maturity level	Category	Organization is capable of performing a service...
	1	Initial	without a documented process that is poorly controlled
	2	Managed	with a formal documented process with evidence of expertise and trained personnel
	3	Defined	at maturity level 2 and demonstrates the use of defined, established and documented processes as well as defined training schemas for personnel
	4 & 5	Improving	at maturity level 3 as well as demonstration of continuous improvement (e.g., internal audit report)

21. Figure: CMMI maturity levels

There may be more standards in quality management that might be implemented for even better efficiency and effectiveness, even if Eaton Corporation's quality control system is based on an acknowledged worldwide standard and offers certain advantages. Eaton Corporation can maintain its leadership position in the market and continue to satisfy its customers' changing demands by re-evaluating and enhancing its quality management procedures on a regular basis.

The System's Effect on Company Performance

The performance of Eaton Corporation's business has been considerably affected by its quality management system. The organization has been able to boost customer happiness and loyalty while lowering costs and improving product quality by putting a strong emphasis on risk management, continuous improvement, and customer demands.

The effectiveness of Eaton Corporation's quality management system may have been influenced in the following specific ways:

- **Improved Product Quality:** By locating and removing flaws and process variability, Eaton Corporation's quality management system has improved product quality. As a result, there has been fewer product recalls, more satisfied customers, and more reliable products.

- **Increased Efficiency and Cost Savings:** Eaton Corporation proved able to save money and improve the efficiency of its operations by employing a process-centred approach to the management of quality to find and remove areas of waste and inefficiency.

- **Enhanced Customer Satisfaction and Loyalty:** Enhanced levels of loyalty and satisfaction with clients are the results of Eaton Corporation's emphasis on client demands and ongoing improvement. The business has been able to forge lasting relationships with its consumers by paying attention to client input and adopting improvements to enhance products and services.

- **Better Risk Management:** The based-on-risk method of quality management used by Eaton Corporation has aided in identifying possible hazards and putting controls in place to reduce those risks. As a result, product dependability and safety have increased, and the likelihood of litigation or other legal problems has decreased.

In its entirety, Eaton Corporation's quality management system has enhanced product quality, increased efficiency, increased customer happiness and loyalty, and reduced risks, which has had a beneficial effect on the company's overall success. Eaton Corporation has the potential to enhance business success and maintain its position as the global leader in energy management solutions by investing in quality control and consistently enhancing its processes and products.

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.:
10000406733-MSC-RvA-DEU

Initial certification date:
18 December 2015

Valid:
18 December 2021 – 17 December 2024

This is to certify that the management system of

Eaton Technologies GmbH

Auf der Heide 2, 53947 Nettersheim, Germany

and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Energy Management System standard:

ISO 50001:2018

This certificate is valid for the following scope:

Development, design, manufacture and distribution of filter media, filtration systems, contamination, control and particle counting systems, bag and cartridge filter housings, separators, strainer basket and automatic filters, fluid condition monitoring and analysis systems, measuring and test equipment, oil service equipment and beverage treatment equipment. For applications in plant engineering, service of the chemical and pharmaceutical industry, food and beverage industry, industrial and municipal water treatment, petrochemical industry, shipbuilding, automotive industry, agriculture, construction and power generation.

The scope of the scheme includes all processes and facilities under the control of the company at the certified sites.

Place and date:
Barendrecht, 30 November 2021

For the issuing office:
DNV - Business Assurance
Zwolseweg 1, 2994 LB Barendrecht, Netherlands

MGMT. SYS. RvA C 024

Erie Koek
Management Representative

ACCREDITED UNIT: DNV Business Assurance B.V., Zwolseweg 1, 2994 LB, Barendrecht, Netherlands - TEL: +31(0)102922689. www.dnv.com/assurance

ISO 14001

Certificate of Registration

ERM Certification and Verification Services

Exchequer Court
33 St. Mary Axe
London EC3A 8AA
Tel: +44 (0)20 3206 5281
Fax: +44 (0)20 3206 5442
post@ermcvs.com

This is to certify that

Eaton Aerospace Corporate HQ

ERMCVS

Certificate Number: 481
Initial ERM CVS Issue date: 25 September 2020
Revision Date: 17 January 2022
Expiry Date: 2 May 2024
Version #: 9

at

9650 Jeronimo Road, Irvine, CA, 92618-2024, USA

UKAS MANAGEMENT SYSTEMS
067

has been registered to ISO 14001:2015 for

Manufacture, research, development of parts, components, assemblies and systems associated with Aerospace

Signed on behalf of ERM CVS by:

Peter Wilson
Managing Director

RESEARCH DESIGN AND RESULT

Research Design

The objective of the empirical research is to examine the effectiveness of the Eaton Corporation Quality Management System as well as its effects on worker productivity and motivation. We will observe what Eaton Corporation employees consider when discussing the company's quality management system, the quality management tools utilized for assessing their performance, and the impact of the QMS on their performance and motivation because the Eaton Corporation Quality management system as well as its procedures have been presented in the theoretical part. We will gather information from their responses that will help us make suggestions for changes and provide recommendations.

The purpose of the survey is to collect employee responses, which will be used to evaluate the hypothesis and determine its plausibility.

The most often utilized research design instrument is a survey. A questionnaire is a piece of writing that includes a number of both open-ended and closed-ended questions. Surveys and questionnaires are frequently used because they are good at giving researchers a large number of testimonies.

We specifically targeted Eaton Corporation workers for our investigation. Nearly all of Eaton Corporation's departments were represented in the research's sampling frame of about 100 individuals, and 91 of those people supplied responses. The Google Forms platform was used to collect the study data using a self-administered digital questionnaire. With the aid of my friends and the corporate network, the URL to the survey was disseminated online. From March 27 to April 7 of 2023, the collaboration window was open, giving workers adequate time to receive and complete the form.

The questionnaire titled "Quality management effectiveness at Eaton Corporation" was composed in English. There are open-ended and closed-ended questions, 5-point Likert scale questions, and questions with multiple choices. These kinds of inquiries are appropriate in particular research situations.

In addition to basic questions on the respondents' demographics (such as gender, age, job experience, educational level, etc.), four theme parts were created, as shown below, and a final section that included suggestions for improvement.

✓ Quality management in Eaton Corporation.

✓ Employees' opinions on the chosen QM tools in Eaton Corporation.

✓ Eaton Corporation’s Quality management methods affect employees' work performance.

✓ Eaton Corporation's quality management effect on employees' motivation.

The preparation of the database and the statistical analysis were the two key processes in the analysis of the acquired data. In order to examine the findings using statistical analysis of the several categories of data (scale, ordinal, and nominal), the data from Google Forms were exported to a Google sheet. Frequency, mean, and deviation was employed as descriptive statistics in the analysis.

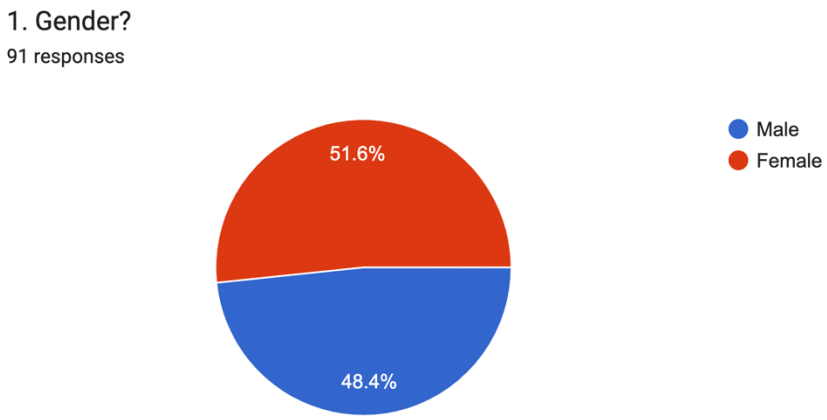
Before conducting the research, one main hypothesis was formulated:

Employees concur that Eaton Corporation's quality management is effective and has a favourable effect on their performance.

Analysis of the research results

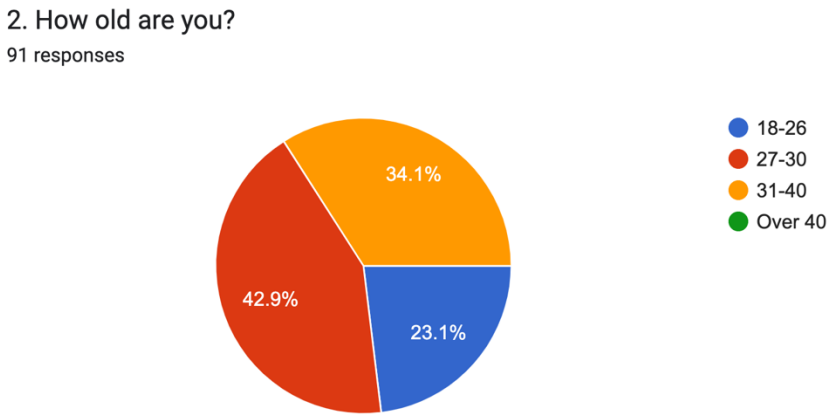
Analysis of the demographics section of the questionnaire.

The analyses conducted in this part will aid in identifying the study sample's representativeness and providing a description of the respondents.



22. Figure: Gender data

As you can see in the pie chart, most of the respondents are Female (47), representing 51.6%, whereas (44) are Male representing 48.4%.

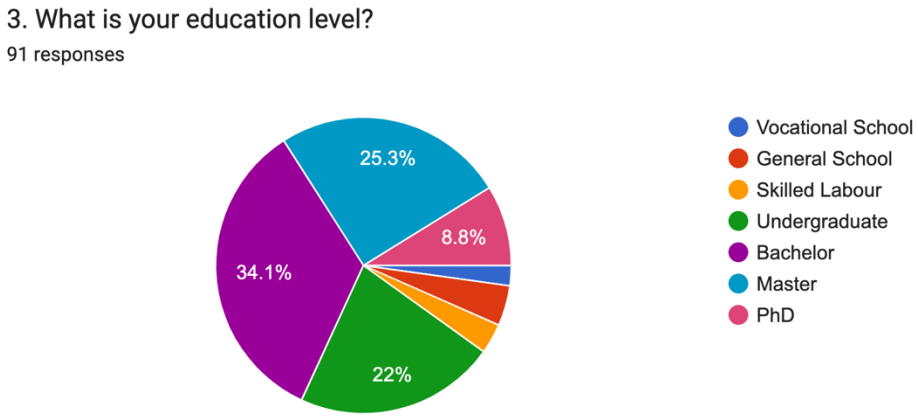


23. Figure: Age data

The majority of the respondents (42.9%), who are spread throughout a range of ages, are between the ages of 27 and 30.

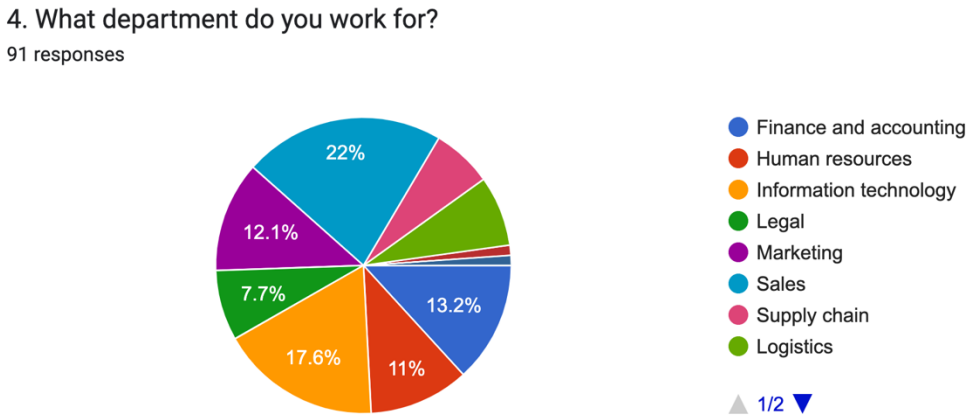
The respondents were divided into four categories of age: 18 to 26, 27 to 30, 31 to 40, and above 40. These age ranges represent the maximum number of years that a person might work. individuals in their 20s have just finished college, individuals in their 30s have worked for a number of years, and those in their 40s, who are considered mature adults, have probably been employed for more than twenty years.

A total of 21 respondents, or 23.1%, are young people (18 to 26 years old), 39 respondents, or 42.9%, are between 27 and 30, and 31 respondents, or 34.1%, are between 31 and 40 years old. The age distribution of the workforce reveals that they come from many generations, and the majority of them (more than 50% of respondents) are young people with some work experience.



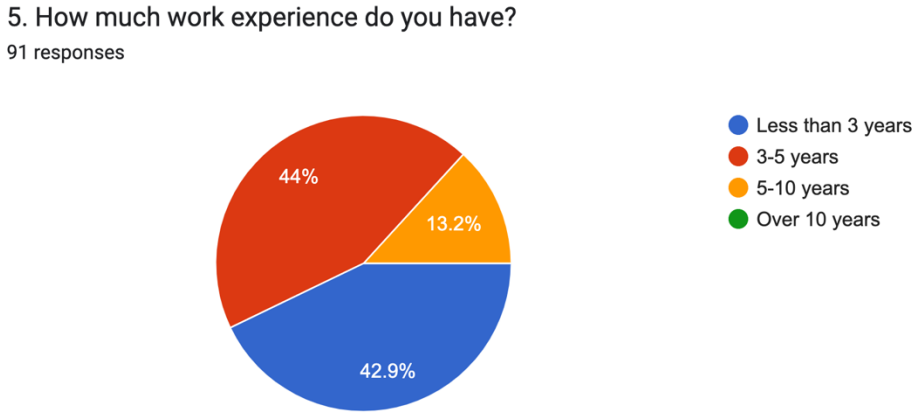
24. Figure: Education level

More than 69.23% of respondents (about 63 respondents) have higher education credentials, of whom 34.1% have bachelor's degrees (25 respondents), 25.3% have master's degrees (23 respondents), and 8.8% have doctoral degrees (8 respondents). twenty workers (or 22%) have an undergraduate degree.



25. Figure: departments

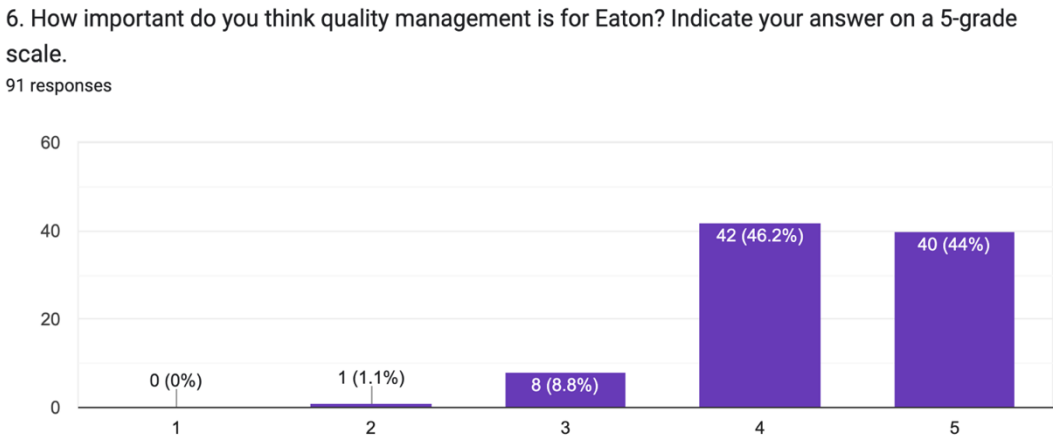
The majority of respondents, as indicated above, work in the sales division (20 employees; 22%), followed by the statistical technology team (17.6%), the accounting and finance team (13.2%), the marketing team (12.1%), the human resources staff (11%), and the legal department (7.7%).



26. Figure: Experience

Employees at Eaton Corporation were questioned about their level of internal job experience. According to their responses, the majority of respondents are young individuals who have been employed by the firm for less than three years (39 workers; 42.9%); 44% of them have between

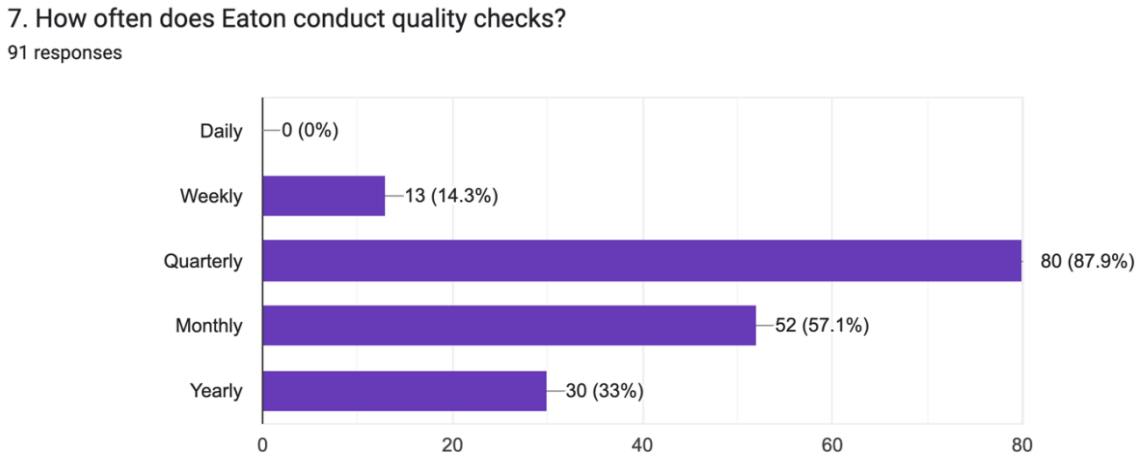
three and five years of experience working for Eaton Corporation (40 persons); and 12 respondents (13.2%) have been there for five to ten years.



27. Figure: How important do you think quality management is for Eaton

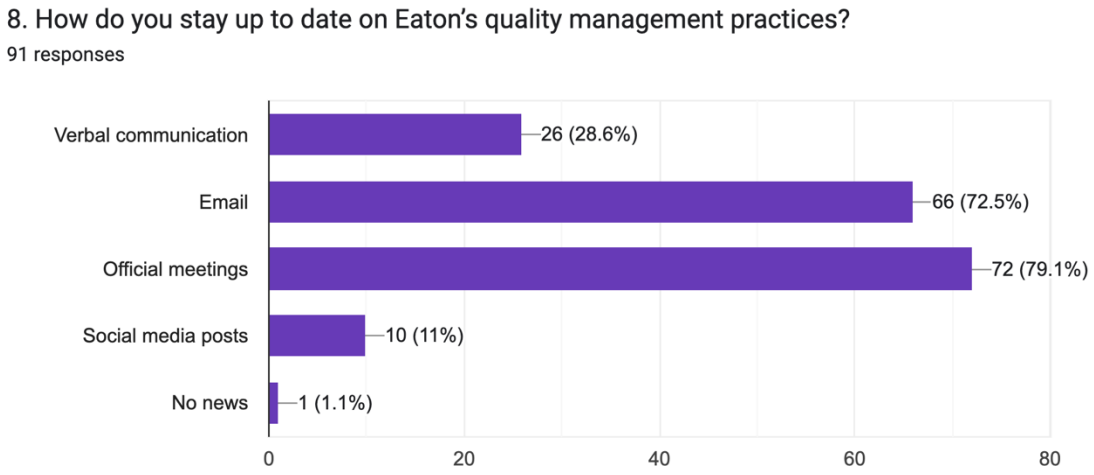
Employees at Eaton Corporation were questioned on the significance of quality management to the business. On a five-point scale, where 1 represents "not important at all" and 5 represents "very important," respondents may express their ideas. The goal of these is to identify no individuals who selected the first two categories ('not important at all' and 'very not important'). The majority of employees (40 employees: 44%) agreed that quality management is crucial and relevant for the business. 42 employees, or 46.2%, agreed that quality management is crucial, and just 8 of them (8.8%) have an unfavourable view of how crucial quality management is to the business. As a result, we can conclude that practically all workers (91.3%) concur that quality management is crucial for Eaton Corporation.

Since the majority of those who responded are young individuals with less than three years of expertise, their views on the significance of quality management are unrelated to their professional backgrounds. Instead, since they began working for the organization, the majority of workers have understood the value of quality management.



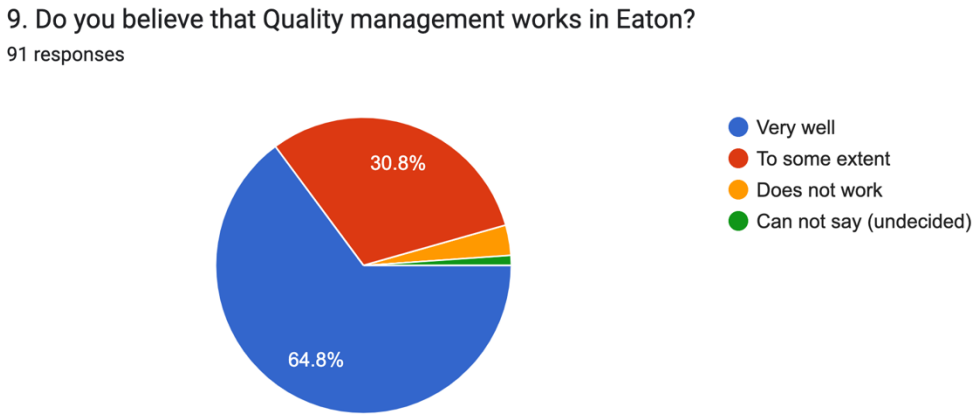
28. Figure: How often does Eaton conduct quality checks

The figure above shows that 79 workers (87.9%) said that quality inspections are performed. Only 13 employees (14.3%) indicated that it was accomplished every week, while 52 individuals (57.1%) claimed that it is done quarterly, 30 employees (33%) claimed that it is done annually, and so on. We may conclude that individual opinions on quality checks vary based on the department and the respondent's position.



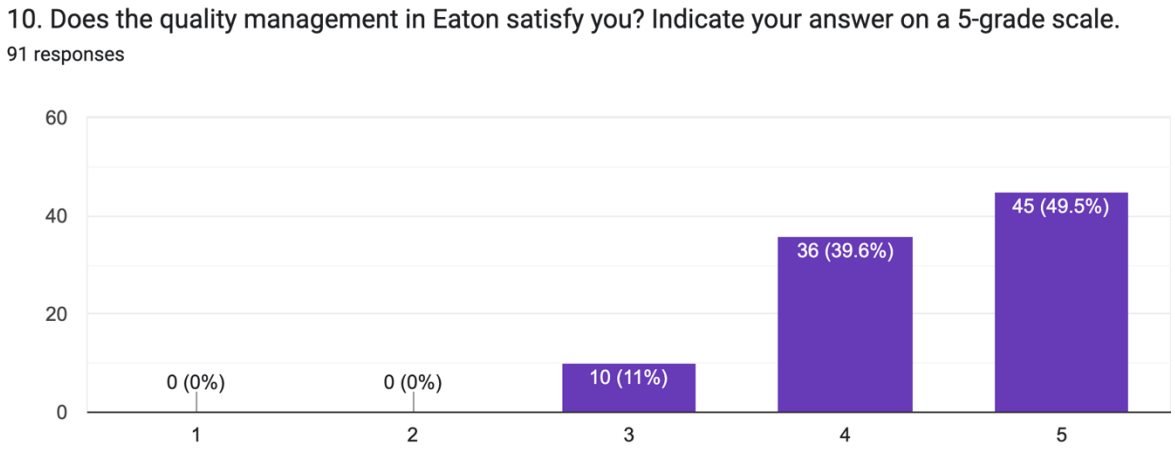
29. Figure: How do you stay updated on quality management

News and quality management methods are disseminated in many ways, as shown in the figure above. Each division has a different method of communication. In official meetings, 79.1% of those polled (72 people) claimed they receive information about quality management practices; verbal communication, 28.6% of respondents (26 people); emails, 72.5% of respondents (66 people); social media posts, only 11% of respondents (10 people); and never, 1.1% of respondents (1 person). It appears that the channels of communication used by Eaton Corporation rely on the department head and how actively the employees participate. whether or if the staff are sufficiently involved.



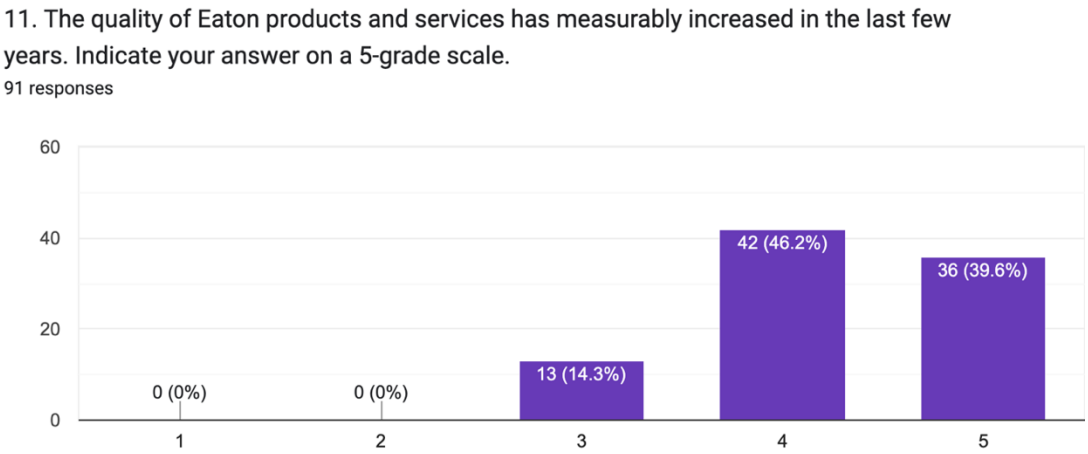
30. Figure: How quality management works in Eaton

The pie chart shows that more than half of respondents (64.8%) believe that quality management entirely succeeds at Eaton Corporation; 30.8% believe it succeeds, but only to a limited level; and a very small number of respondents, for unknown reasons, are unable to make up their minds. Some of the responders selected the response "Does Not Work".



31. Figure: How quality management satisfies its employees

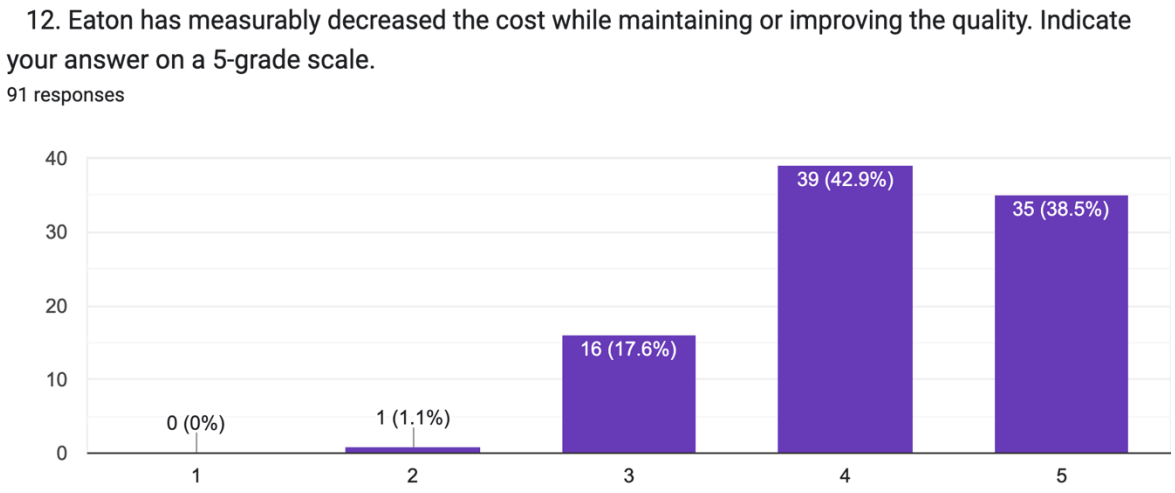
In 5-grade scale questions, the first two options—"Not satisfied at all" and "Not satisfied"—are not allowed as choices. 45 respondents, or 49.5%, said they were very happy with Eaton Corporation's quality management. 39.6% of the respondents, or 36 respondents, said that quality management meets their needs. 11% of the sample (10 persons) are unsure of their level of satisfaction. No respondents expressed dissatisfaction with Eaton Corporation's quality management.



32. Figure: Quality of Eaton products increased in years

36 respondents, or 39.6% of the total, reported that Eaton Corporation's quality of goods and services has significantly improved in recent years. 42 workers, or 46.2%, concur and believe the quality has improved, whereas 13 employees, or 14.3%, are unsure whether the quality has

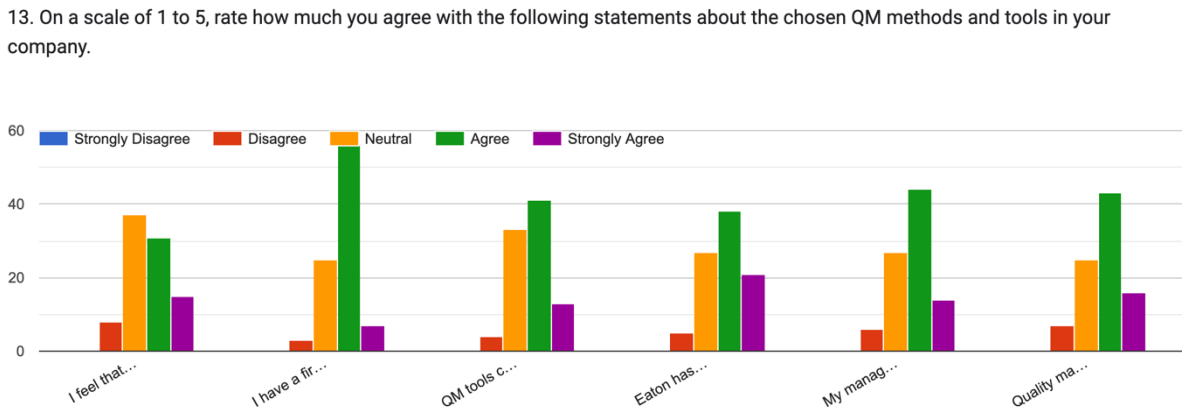
gotten better or not. No respondents thought that the standard of Eaton Corporation's goods and services had declined.



33. Figure: Eaton decreased cost while maintaining quality

35 respondents, or 38.5%, strongly concur that Eaton Corporation might cut costs by using high-quality systems. 17.6% of the workforce (16 individuals) are unsure whether expenses have grown or decreased, whereas 42.9% of employees (39 persons) concur that prices have decreased. No responders could confirm that prices had increased.

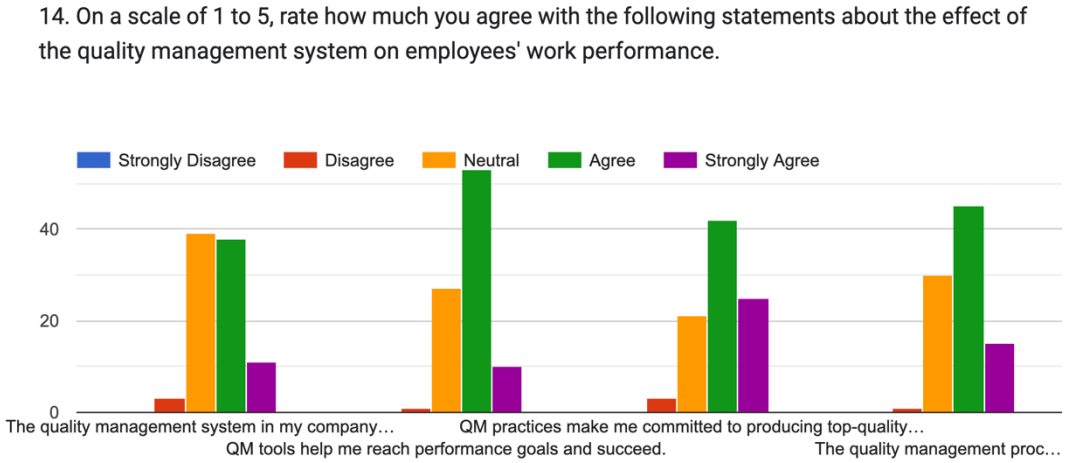
Employees of Eaton Corporation were also questioned about their thoughts on the quality measurement tools and methodologies chosen, how they affected how well they did their jobs, and how quality management policies and procedures affected how well they did their jobs. The questions have been divided into three major questions, each of which has six, four, and eight answers. Respondents may rate their agreement with each statement on a five-point Likert scale, with 1 denoting severe disagreement and 5 denoting strong agreement.



34. Figure: QM methods in Eaton

The majority of comments are favourable toward Eaton Corporation's quality management solutions, as indicated in the graph. Regarding the first claim, 35% of respondents concur that Eaton Corporation's instruments for quality management are effective at measuring quality. The majority of respondents (60%) affirm that they have a thorough grasp of the quality management procedure in the second statement. Regarding the third assertion, the majority of workers (40%) think that QM tools take into account all quality viewpoints. Regarding the fourth claim, 48.33% of respondents firmly believe that Eaton Corporation gives its managers the information and guidelines they need to assess their work performance using a range of quality management methods. Regarding the fifth assertion, 45.1% of those polled are certain that their boss employs instruments of mediocre quality. Regarding the sixth and final assertion, 43.33% of employees at Eaton Corporation have faith in the effectiveness of the company's quality management instruments.

The responses provided by respondents suggest that workers generally concur that Eaton Corporation's quality management tools are effective and well-organized. Additionally, given the majority of respondents are under 30, and 42.9% of them have fewer than three years of experience, we are unable to correlate respondents' judgments of the efficiency of quality management systems with their years of experience. As a result, we can attest to the great effectiveness of quality management solutions.

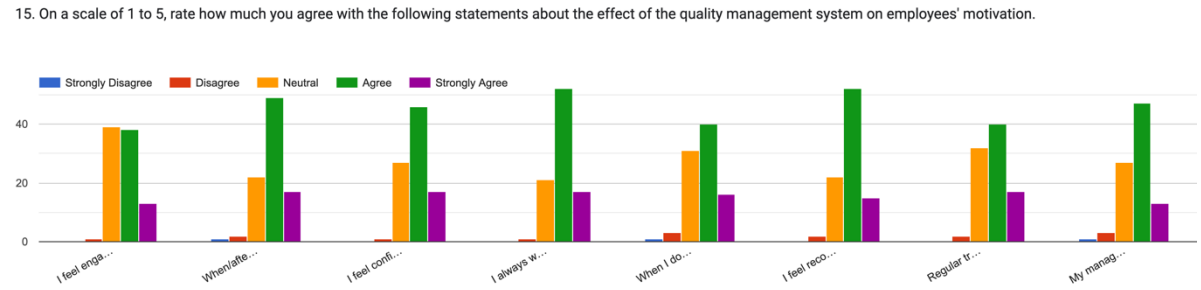


35. Figure: Effect of quality management on employees' work performance

Positive data are displayed in the graph. No workers at all disagree with the aforementioned comments. Only a few participants are impartial in their assessments of how quality management has affected their ability to function at work, and the majority of responses are supportive.

Regarding the first claim, 38% of respondents overall, or greater, concur that Eaton Corporation's quality management system enhances employee performance. In terms of the second component, 55% of workers said that effective management tools assist them in achieving their performance objectives and success. Regarding the third claim, 42% of respondents concur that using quality management techniques motivates them to produce

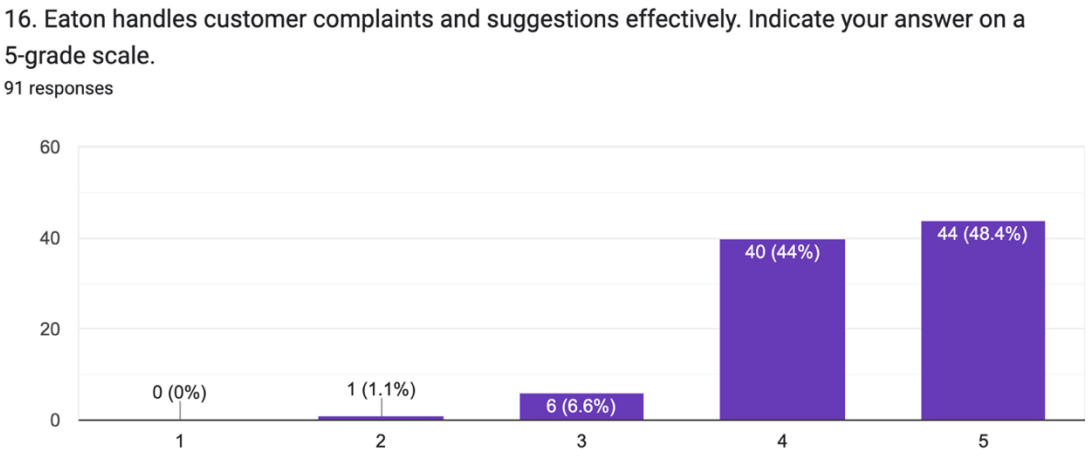
excellent work and do their duties flawlessly. Regarding the fourth claim, 45% of respondents completely concur that Eaton Corporation's quality management system is effective in gauging employees' performance. It is clear that the majority of employees completely stated their views on the impact of quality management on their job performance.



36. Figure: Effect of QMS on Employees' Motivation

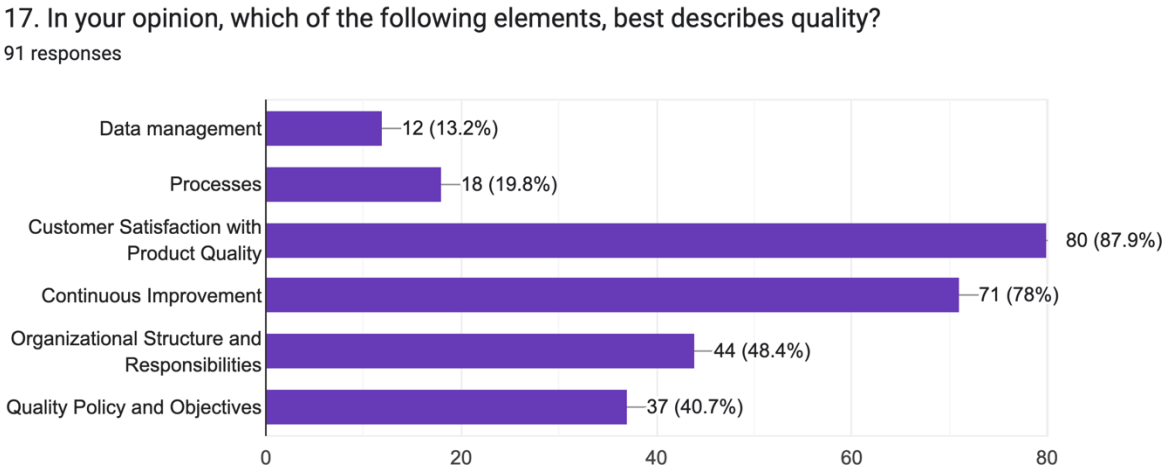
The graph shows that respondents' responses are convergent and identical. Only a few workers disagree with some of the aforementioned claims, but the majority do. The majority of respondents (48%) concur with the first claim that they feel motivated to contribute to the company's quality management system. In regards to the second claim, 48.66% of those surveyed report feeling inspired to work during or after using quality management procedures. When subject to quality management tests, 45.32% of employees report feeling confident, according to the replies to the third statement. The majority of respondents (51.99%) to the fourth statement said they always desire to offer their best effort while at work. Regarding the fifth, 40.66% of workers claimed that their bosses pay attention to their efforts wherever they perform well and appropriately. Regarding the sixth claim, 52.66% of workers feel appreciated when they help their team succeed. Employees are acknowledged by their management and coworkers. Regarding the eighth claim, 40.33% of those surveyed claimed that continuing education maintains them competent, current, and enthusiastic to work. Regarding the ninth claim, 47% of staff members explained that their boss pays attention to their recommendations and treats their concerns in a fair and reasonable manner.

Last but not least, we sought feedback from workers regarding how Eaton Corporation handles customer complaints and suggestions as well as the components that constitute quality as well as how they might use and enhance it.



37. Figure: Handling customer's complaints and suggestions

No workers stated that Eaton Corporation did not handle customer complaints appropriately, as seen in the chart, which is compatible with the survey's objective. 48.4% (44 participants) believe the business manages consumer complaints and suggestions successfully. Only 6.6% of those surveyed (6 persons) do not know how the firm handles complaints.



38. Figure: what does quality mean at Eaton?

We provide the employees with the opportunity to indicate which aspect best defines the quality and the way they can make it better in the final graph. People had the option of selecting more than one component that best characterizes quality in the multiple-choice question.

Customer happiness and ongoing improvement, according to the majority of respondents, are the two defining qualities of quality. About 87.9% of them (80 individuals) stated that developing and implementing quality relies heavily on customer happiness, and 78% of employees (71 people) believe that process improvement should always be a priority. 18 of them, or 19.8% of them, are necessary for effective implementation. 12.3% of the staff members (or 12 persons) concur that data management might be a key component in raising quality. Finally, 40.7% of respondents (37 individuals) agree that quality improvement is

connected to changes to quality policy and objectives. Of the respondents, 48.4% (or 44 people) think that changes to organizational makeup and duties would be the greatest method to increase quality.

Hypothesis testing

We formulated the following statement before beginning our research: "Employees concur that Eaton Corporation's quality management is effective and positively impacts their performance." The two variables of the hypothesis are the effectiveness of quality management and its effect on employees' performance. Data from earlier charts and graphs show that the majority of employees think Eaton Corporation's quality management is effective and has a positive effect on their job performance. However, fewer than 7% of workers are unable to determine if quality management is effective or not. Therefore, it is important to reiterate that the empirical study supported the theory.

IV. Conclusion

Summary of Findings

Our goal was to investigate the effectiveness of quality management at Eaton Corporation and how it affected worker motivation and output throughout the research. Additionally, we tried to comprehend how quality management is assessed and viewed from the viewpoint of the employees. The results showed that staff members are knowledgeable about many facets of quality management, quality management procedures, and the organization's quality management system. Additionally, they acknowledge and guarantee the importance of quality management and its role in Eaton Corporation's performance.

More than 90% of those who participated from various departments concurred that the company's quality management is effective and efficient, and they are very happy with it. Additionally, they said that over the past few years, quality management has improved, resulting in higher-quality goods and services at lower costs.

Most respondents expressed positive opinions about the quality management techniques and tools that were employed to assess how well they were performing for the company. They also agreed that Eaton Corporation does a good job measuring quality and that its quality management techniques conceal all quality perspectives. Finally, they were adamant that Eaton Corporation gave their managers the necessary information and guidelines to use these tools to assess their employees' performance. They also believe that their boss treats them fairly, which gives them confidence in the Eaton Corporation's quality management methods.

The majority of respondents felt that quality management had a significant impact on employees' ability to perform at work when asked about this. They think that Eaton Corporation's quality management system enhances their performance. They acknowledge that using quality management tools enables them to succeed and meet their performance objectives. They concur that using quality management techniques makes them more dedicated to delivering excellent work, doing their duties flawlessly, and accurately evaluating their performance. Employees also concur that they feel motivated to contribute to the company's quality management system. Finally, they emphasize that their boss listens to their recommendations and treats their complaints fairly and sensibly. They say that their manager

notices their efforts whenever they perform a good and acceptable job and feel appreciated as they help contribute to their team's success.

In a nutshell, Eaton Corporation has demonstrated the effectiveness of quality management, which also improves worker performance and increases motivation. To get greater results, one must always go forward. According to the study's findings, it is advised to continue handling customer issues and feedback effectively, considering the suggestions and grievances of employees, as well as their work and effort, and rewarding them in order to show them that their efforts are valued so that they will continue to feel inspired and contributing to the business. Employees also recommended upgrading quality goals and objectives, improving quality procedures, and concentrating on ongoing enhancement to increase customer satisfaction.

References

1.Albert Weckenmann, Goekhan Akkasoglu, Teresa Werner. 2015. "Quality management – history and trends." *The TQM Journal.* https://www.emerald.com/insight/content/doi/10.1108/TQM-11-2013-0125/full/html

2. Almaraz, Jeanne. 1994. "Quality Management and the Process of Change." *Journal of Organizational Change Management.* https://www.emerald.com/insight/content/doi/10.1108/09534819410056096/full/html

3. Black, S. 2010. "An empirical model for total quality management." *Total Quality Management* .Enrique Claver, Juan José Tarí, José Francisco Molina. 2021. "How quality management can enhance performance? A model of relationships mediated by innovation." *Production Planning and Control.* https://www.tandfonline.com/doi/full/10.1080/09537287.2021.1946328

4. Greatbanks, David R. Bamford and Richard W. 2005. "The use of quality management tools and techniques: astudy of application in everyday situation." *Emerald Insight.* 141743 376..392 (up.pt)

5. Jayant V. Saraph, P. George Benson, Roger G. Schroeder. 1989. "An Instrument for Measuring the Critical Factors of Quality Management." *Decision Sciences.* https://onlinelibrary.wiley.com/doi/10.1111/j.1540-5915.1989.tb01421.x

6. Jens J. Dahlgaard, Lidia Reyes,Chi-Kuang Chen &Su Mi Dahlgaard-Park. 2019. "Evolution and future of total quality management: management control and organisational learning." *Total Quality Management & Business Excellence* . https://www.tandfonline.com/doi/abs/10.1080/14783363.2019.1665776?journalCode=ctqm20

7. John C. Anderson, Manus Rungtusanatham and Roger G. Schroeder. 1994. "A Theory Of Quality Management Underlying The Deming Management Method." *Academy of Management Review.* https://journals.aom.org/doi/abs/10.5465/amr.1994.9412271808

8. Masood A. Badri, Donald Davis, Donna Davis. 1995. "A study of measuring the critical factors of quality management." *International Journal of Quality & Reliability Management.* https://www.emerald.com/insight/content/doi/10.1108/02656719510080604/full/html

9. Mehran Ebrahimi, Mehran Sadeghi. 2013. "Quality management and performance: An annotated review." *International Journal of Production Research* . Quality management and performance: An annotated review: https://www.tandfonline.com/doi/full/10.1080/00207543.2013.793426

10. Olga Rodriguez-Arnaldo, Angel R. Martínez-Lorente. 2020. "What determinants influence the diffusion of ISO 9001 by countries?" *The TQM Journal.* https://www.emerald.com/insight/content/doi/10.1108/TQM-03-2020-0055/full/html?skipTracking=true

11. P. George Benson, Jayant V. Saraph, Roger G. Schroeder. 1991. "The Effects of Organizational Context on Quality Management: An Empirical Investigation." *Management Science.*https://pubsonline.informs.org/doi/10.1287/mnsc.37.9.1107

12. Petersen, Peter B. 1999. "Total quality management and the Deming approach to quality management." *Journal of Management History (Archive).* https://www.emerald.com/insight/content/doi/10.1108/13552529910290520/full/html

13. Priede, Jānis. 2012. "Implementation of Quality Management System ISO 9001 in the World and Its Strategic Necessity." *ELSEVEIR.* https://www.sciencedirect.com/science/article/pii/S1877042812045958

14. Shahin, Arash. 2004. "ISO 9000 and Total Quality Management: A Transition Model." *The 5th Quality Managers.* Tehran. https://www.researchgate.net/publication/313250982_ISO_9000_and_Total_Quality_Management_A_Transition_Model

15. Singh, Vimlan Moonsamy and Shalini. 2012. "A 21st Century framework for quality management." *African Journal of Business Management Vol.6.* https://pdfs.semanticscholar.org/5cb9/ffdc44def19599d832bda54178b3f3ed265c.pdf

16. Spencer, Barbara A. 1994. "Models Of Organization And Total Quality Management: A Comparison And Critical Evaluation." *Academy of Management Review.* https://journals.aom.org/doi/abs/10.5465/AMR.1994.9412271807

17. Tarí, Juan José. 2005. "Components of successful total quality management." *The TQM Magazine.* https://www.emerald.com/insight/content/doi/10.1108/09544780510583245/full/html

18. Wilkinson, Josephine Yong &Adrian. 2010. "Rethinking total quality management." *Total Quality Management* . https://www.tandfonline.com/doi/abs/10.1080/09544120120011460

19. Yvonne Lagrosen, Stefan Lagrosen. 2005. "The effects of quality management – a survey of Swedish quality professionals." *International Journal of Operations & Production Management.* https://www.emerald.com/insight/content/doi/10.1108/01443570510619464/full/html

20. Snežana Topalovi. 2015. " The Implementation of Total Quality Management in Order to Improve Production Performance and Enhancing the Level of Customer Satisfaction." *Procedia Technology. pages 1016-1022.* https://www.sciencedirect.com/science/article/pii/S2212017315001462