

MINISTER OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH



MOULOU D MAMMERI TIZI OUZOU UNIVERSITY

FACULTY OF ECONOMICS, MANAGEMENT AND BUSINESS SCIENCES

DEPARTMENT OF MANAGEMENT SCIENCES

Master's thesis

In order to obtain the Master's degree

Option: Master's degree in Strategic Management

**Quality Management and Sustainable Development: Links
and
Organizational challenges. Case of ENIEM**

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ACKNOWLEDGMENTS

We begin by expressing our heartfelt gratitude to God, the Almighty, for endowing us with the strength and determination to complete this work.

Our deepest thanks go to our beloved parents, whose unwavering support and encouragement have been instrumental in our journey to success.

We are profoundly grateful to our supervisor Mr. **AHMED KABENE**, for his unvaluable guidance, consistent follow-up, and insightful advice, which were crucial in shaping this work.

We also wish to extend our sincere appreciation to the jury members; **Miss Smina CHEKAOUI** and **Mr. Mohamed Hicham GUELMINE** for their willingness to review and assess our work.

Our thanks go to ENIEM for providing us with the data throughout our internship.

Lastly, we extend our thanks to everyone who contributed especially my friends and classmates, in any way, to the completion of this work.

May we continue to be guided and blessed on our path

DEDICATION

To my incredible precious parents, whose endless love and sacrifices have shaped my journey and made every dream possible. Your belief in me has been my guiding light, and this achievement is a reflection of your unwavering support and encouragement.

To my beloved brothers **KARIM**, **RAYAN**, and **MOHAMED**, seeing you proud to have me as a sister means the world to me. “**MOHAMED**”, thank you for staying up all night to motivate me, big hug little brother.

To my dearest best friend **JADE**, my priceless gift that God gave me through these years, this work was supposed to be ours but Allah had another plan for us, may God heal you, I miss you so badly, lots of love.

Imen

List of abbreviations

- **AFNOR:** French Standardization Association
- **ANEM:** national employment agency
- **ENIEM:** National Company for Household Appliance Industry
- **EMS:** Environment Management System
- **HSE:** Hygiene, Safety, Environment
- **HSI:** Hygiene, Safety, industrial
- **ISEC:** Industrial Sanitary Equipment Company
- **ISO:** International Organization for Standardization
- **ISO 9000:** Quality management system
- **ISO 9001:** Quality Management System, developed version
- **ISO 14001:** Environment Management System
- **ONEDD:** National Observatory of the Environment and Sustainable Development
- **PDCA:** Plan, Do, Check, Act
- **QMS:** Quality Management System
- **SWOT:** Strengths, weaknesses, opportunities, threats
- **TQM:** Total Quality Management

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INTRODUCTION:

Quality Management System is a set of practices and processes that a company uses to ensure that its products and services meet the highest level of customer satisfaction.

ENIEM which is a key player in the Algerian home appliance industry. ENIEM is one of the enterprises that have established a Quality Management System to improve its product's quality and efficiency in enhancing the customers satisfaction.

It is given that quality management plays a vital role for organizations that want to grow and succeed amid competition in the market. Once again, regardless of whether an organization is producing products or delivering services, quality is considered a critical success factor. Companies employ processes of quality management for the purpose of improving efficiency, productivity, and profitability, and to meet customer expectations and requirements.

In the field of quality, ISO 9001 standard is based on requirements and procedures that allow organizations to demonstrate quality and compliance in advance. For the environment, the ISO 14001 standard defines the requirements for an environmental management system that enables organizations to evaluate and control their activities and their impact on the environment. These requirements can be integrated and harmonized within the framework of global management approaches across various domains.

Problem research:

In this context, our study revolves around the analysis of Sustainable development in a quality management approach at the ENIEM by analyzing the QMS data given to us by ENIEM and two ancient thesis that speaks about the Quality within ENIEM, and also a several number of articles. Our main objective is to answer the following question:

❖ **What is the impact of implementing a quality management system on ENIEM's sustainable development?**

From this main question, a several questions arise:

- What is the role of ISO 9001:2015 in improving the quality management system efficiency?
- Can ENIEM rely only on Quality Management System to achieve its set goals?
- What are the external factors that might be part of sustainable development achievement?
- Has ENIEM achieved a fully sustainable development?

We can have two Hypotheses from these questions:

- Quality Management System has a crucial role on a company's sustainable development in all its key aspects, it enhances achieving the product's highest quality including the set goals of the company.
- Quality Management System may have a positive impact on a company's sustainable development but it could be influenced by some external factors that lead to not achieving sustainable development nor the set goals.

To get an answer of each question written above, our research methodology was to do a several researches on ancient thesis, on internet sites, works and that's to have more clue about the concepts related to our thesis. And then we had an internship within ENIEM company that helped us to improve and enhance our skills. The main work was about comparing the quality management system achievements within ENIEM on two periods, the 2014-2017 period and the 2020 period. We chose these two periods because of the important changes and events (such as the COVID-19 pandemic) that happened between them so we can know how really the QMS impacts ENIEM's sustainability, or in another way, does really QMS has an impact on ENIEM's sustainability.

Adding to that we relied on two studies conducted during the respective periods while consulting a press view. Therefore, our method is qualitative.

The plan:

Our work is devised on three chapters:

In the first chapter named “**The Theoretical Framework of Quality Management**”, beginning with an overview of quality, followed by the conceptual framework and approach to quality management, and concludes with a summary of these concepts.

In the second chapter named “**Links between quality management and sustainable development**”, we introduced the conceptual framework of sustainable development and examining how quality management interacts with and impacts sustainability.

In the third chapter named “**Sustainable development in a quality management approach at the ENIEM**”, it details the quality approach and management system at ENIEM. And discusses the challenges of integrating sustainable development within this quality framework.

INTRODUCTION:

Quality is a fundamental concept that holds paramount importance for any organization seeking to thrive and maintain competitiveness in the market. The pursuit of quality is inherently linked to customer satisfaction, operational efficiency, and the sustainability of the enterprise.

At the heart of the notion of quality lies the ability of a product, service, or process to meet the expectations and requirements of stakeholders. This entails not only meeting technical specifications but also ensuring reliability, durability, safety, and user-friendliness. In other words, quality translates into the capacity to deliver added value to those who use or benefit from the company's products or services.

Quality management encompasses a set of principles, processes, and practices aimed at ensuring and continually improving the quality of products and services. This includes identifying customer needs, designing and implementing effective manufacturing or service delivery processes, monitoring quality throughout the product or service lifecycle, and gathering customer feedback to identify improvement opportunities.

In an increasingly competitive and dynamic business environment, quality has become a critical factor for success for businesses. A reputation for quality can enhance customer trust, foster customer loyalty, reduce costs related to returns and repairs, and lead to sustainable growth. Therefore, quality management is an essential discipline for any organization wishing to thrive in a world focused on customer satisfaction and operational excellence.

In this chapter, we will first focus on some general aspects concerning Quality (Section 01), then we will address quality management through its various aspects (Section 02), and finally, we will conclude with Quality management approach (Section 03).

Section (01): Overview of quality

The concept of quality has been extensively explored by the business world. It is even one of the most studied by marketing research in the last fifteen years. Quality is a key element of differentiation to attract and retain customers in a highly competitive sector. It is a means of improving competitiveness and increasing profits, especially in an environment where innovation is strong, and products are easily imitable.

1.1 The concept of quality:

The concept of 'quality' has existed for forty centuries. Its history begins in the kingdom of Babylon, where the Babylonian king Hammurabi introduced the notion of quality control in production in article 233: « *If a mason has built a house for someone but has not done his work properly and the wall is leaning, that mason shall strengthen the wall at his own expense* »¹ This article is still applied to this day; the costs of reinforcement are explained by the costs of non-quality.

The word "quality" comes from Greek, its etymology is "Qualita", which means « *the manner of being* ». ² It retained its meaning after its passage into French, judging the manner of being as good. But at a time when supply was less than demand, the concept of "quality" was not considered an important element in an economic ³

1.2 The historical evolution of quality:

Quality has undergone numerous evolutions and is now an essential and effective management approach for companies⁴.

The quality has evolved over time. Figure No. 01 summarizes the stages of quality evolution.

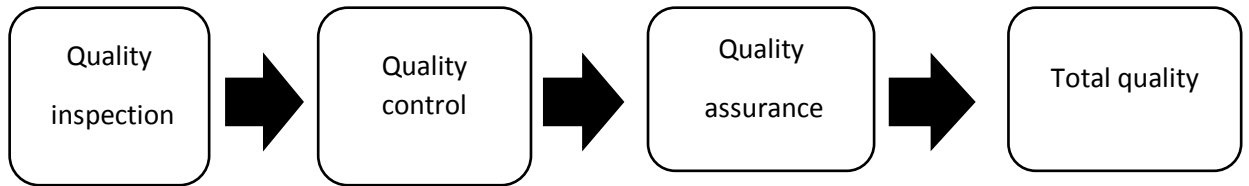
¹ Mr Belhoucine Hamid, Quality management course, Bachelor's degree (L3) at Mouloud Mammeri university, in May 2022. Page 5, 6.

² Larousse Dictionary 2013

³ Mr Belhoucine Hamid, Quality management course, Bachelor's degree (L3) at Mouloud Mammeri university, in May 2022. Page 6.

⁴ CHELBI Thiziri "Management de la qualité un facteur déterminant pour l'amélioration de la compétitivité des entreprises" master's thesis. Abderrahmane MIRA University of Bejaia. 2019. Page 10

Figure N°.01: The stages of quality evolution.



Source: Established by us

1.2.1 Quality Inspection:

Scientific Management, introduced by F.W. Taylor, aimed to rationalize organization through the measurement of time required for each task and worker motivation through wages. Its objective was to increase productivity. The principles of Scientific Management have contributed to improving quality at the production level. However, less skilled labor can lead to quality losses, waste, and rejects, resulting in costs for the company.

Quality inspection is among the foundations of Scientific Management, introduced by F.W. Taylor: « *the inspector is responsible for the quality of the work.* »⁵ Inspection thus concerns the product at the end of the production process. Inspectors only check the execution of tasks to see if they conform to the scientific order. Consequently, the company continues to incur the costs of non-quality, generated by inspection, which becomes increasingly expensive.

1.2.2 Quality control:

Walter Andrew S. began his study by refuting the prevailing model of industrial quality control and observing the objects produced on production lines to try to understand what quality control should be in the future. True to his principle of not accepting anything before verifying it, knowing why control is necessary in industry; for him, a company that wants to eliminate defects without understanding variations or seeking their causes does not improve quality, whereas the purpose of control should be quality improvement.⁶

Quality is an ancient notion, but the concept of quality emerged more recently with the development of mass industrial production in the twenties. This is the period of Taylorism, defined as a scientific organization of work (OST) based on the segmentation of production tasks into extremely simplified operations, with operators entirely subjected to an imposed work rhythm to ensure the productivity goals of management. An independent control service

⁵ TAYLOR F. W., *La direction scientifique des entreprises*, ENAG/ Éditions, 1992, p. 101. Read by Chelbi Thiziri.

⁶ Jean-Marie. GOGUE, « les six samouraï de la qualité », *ECONOMICA*, paris, 1990, p.19.

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intervenes at the end of stages considered decisive to verify the conformity of the manufactured products⁷

In the United States, Frederick W. Taylor presented in « *shop management* » the result of his scientific approach based on observations and quantifications. This rational management relies on the division of labor between designers and executors through the division of tasks. Taylorian quality is not determined by customer expectations; it is entirely defined in relation to the company.⁸

Quality inspection takes place before the product reaches the market; however, individual inspection of finished products becomes increasingly costly as production increases. For this reason, the notion of quality inspection gives way to that of quality control.

In other words, quality is verified before delivery to the customer but is not anticipated.

1.2.1.1 The statistical tools of quality:

The tools are:⁹

1.2.1.1.1 Histogram:

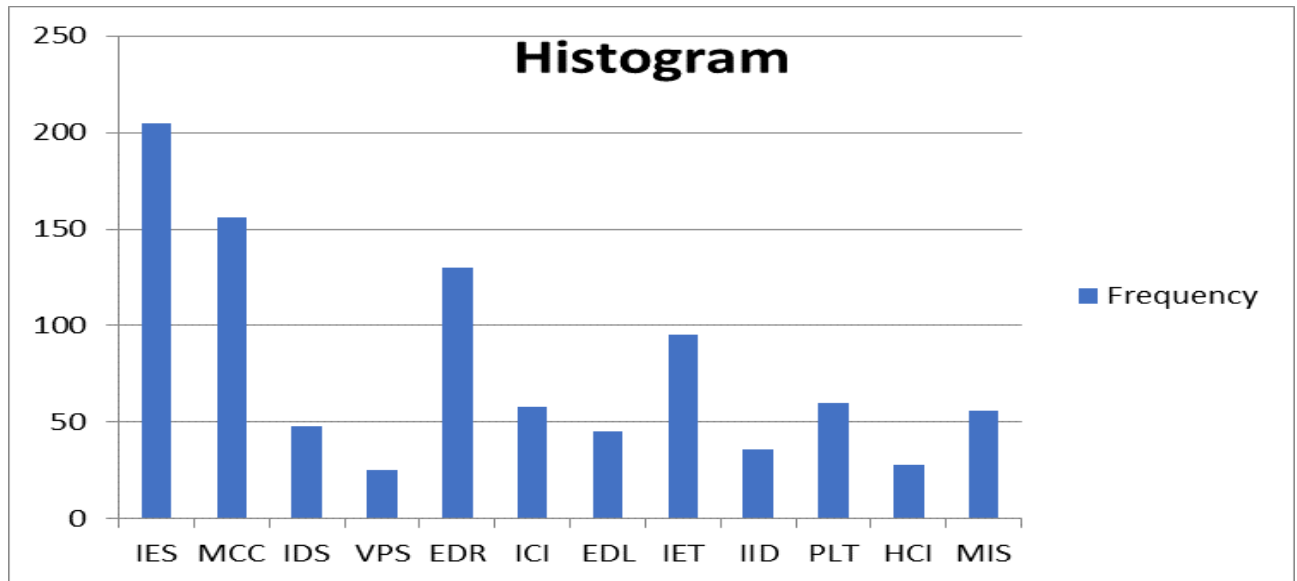
Histogram is a graphical representation constructed from data collected on a sheet. It shows the deviations from the norm, in this case, managers use benchmarking to compare their costs (see graph No. 01).

⁷Fabien. MARTINEZ, (2001) « les principes généraux de la qualité », adsp n0 35, p, 18.

⁸ François. C, Sylvie. R, Virginie. L, « la qualité au XXI Siècle: vers le management de la confiance », éd ECONOMICA, paris, 2002, p, 10

⁹ Mr Belhoucine Hamid, Quality management course, Bachelor's degree (L3) at Mouloud Mammeri university, in May 2022. Page 8,9,10,11,12,13

Graph N°01: Histogram

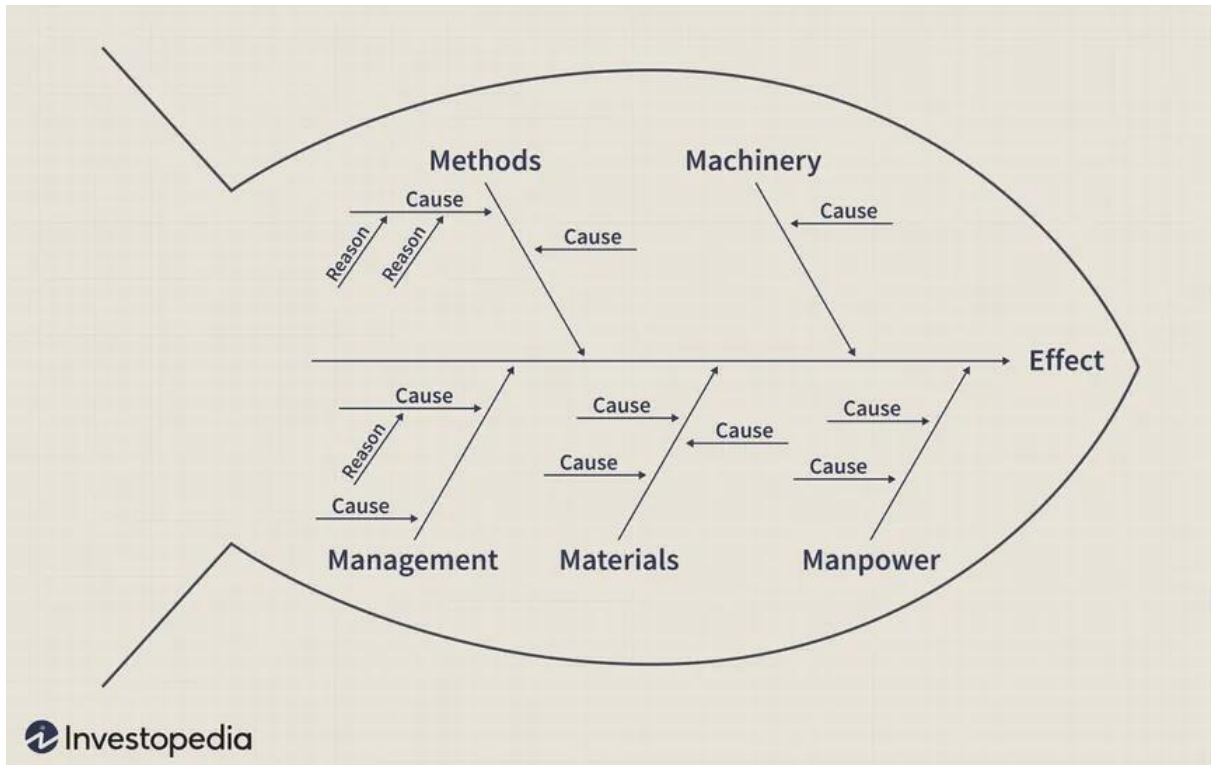


Source: <https://www.izenbridge.com/blog/histogram/> Consulted on March 29th at 17:10

1.2.1.1.2 The cause-and-effect diagram (5M's method):

The first cause-and-effect diagram (also known as ISHIKAWA diagram) was invented by ISHIKAWA at the University of Tokyo in 1943. This diagram, in the form of a fishbone, allows for the analysis of the causes of non-quality within an organization. The five M's of quality are represented in (Figure No. 02): Manpower; Methods; Milieu; Materials; Machines.

Figure N° 02: ISHIKAWA diagram¹⁰



Source: <https://www.investopedia.com/terms/i/ishikawa-diagram.asp>

Each of these causes is considered as a factor that influences quality by generating an effect. This effect is defined as a set of quality characteristics. It is clear that the purpose of the diagram is to illustrate the causes that affect quality, but it does not illustrate the solutions to the problems. The ISHIKAWA diagram serves as a repository of the most reliable data, which enables discussions among different departments to share knowledge.

1.2.1.1.3 The check sheets:

The check sheets are essential to meet the following three criteria:

- Easy recording for operators.
- Clear reading of the records.
- Archiving the records.

This statistical tool has several functions, such as:

- Checking the distribution of defects in the production process.

¹⁰ <https://www.investopedia.com/terms/i/ishikawa-diagram.asp> Consulted on March 29th at 17:39

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- Locating defects.
- Finding the causes of defects.
- Final control.

Each of these functions corresponds to a type of check sheet, with the format differing from one function to another. Figure No. 03 shows an example of a recording sheet format, illustrating frequency distribution. In this case, the numbers are already indicated, so the controller only needed to check the corresponding boxes.

Figure N°: 03: Example of a Check Sheet.¹¹

| Defect Types? Event occurrence | Events | | | | | | | Total |
|--------------------------------------|--------|------------------|-----------|------|------|-----|-----|-------|
| | Sun | Mon | Tue | Wed | Thur | Fri | Sat | |
| Supplied parts rusted | | ✓✓✓ ✓✓✓ ✓✓ | ✓✓✓✓ ✓ | ✓✓✓✓ | ✓✓ | | | 19 |
| Misaligned Weld | | | ✓✓✓ | | | ✓✓ | | 5 |
| Improper Test Procedure | | ✓ | | ✓✓ | | | | 3 |
| Wrong Part Issued | | | | | ✓✓ | | | 2 |
| Film on Parts | | | | ✓✓✓✓ | | ✓✓ | | 6 |
| Voids in Casting | | | | | | | | 0 |
| Incorrect Dimensions | | | | | | | | 0 |
| Adhesive Failure | | | | | ✓ | | | 1 |
| Masking Insufficient | | | | | | | | 0 |
| Spray Failure | | | | ✓✓✓✓ | | | | 4 |
| <i>Total</i> | | 9 | 8 | 14 | 5 | 4 | 0 | 40 |

Source: www.business-online-learning.com

1.2.1.1.4 The pareto diagram:

The Italian economist Pareto is known for the 80/20 principle. He succeeded in applying mathematical laws to economics. Juran observed that this principle is applicable to studying quality defects. Therefore, this method consists of deducing either:

- More than 80% of costs are generated by less than 20% of defects.
- Less than 80% of costs are generated by more than 20% of defects.

¹¹ <https://www.business-online-learning.com/check-sheets.html> consulter on March 29th at 18:45

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The Pareto diagram is constructed from a report of defects, considering the following elements:

- Defective items
- Number of defective items
- Defective item rate
- Weighted percentage per item

Table No. 01 shows a sample pareto about errors during surgical setup. This table will then be translated into a graph (see Graph No. 02), which is the Pareto diagram.

This diagram is created to indicate types of errors discovered during surgical setup.¹²

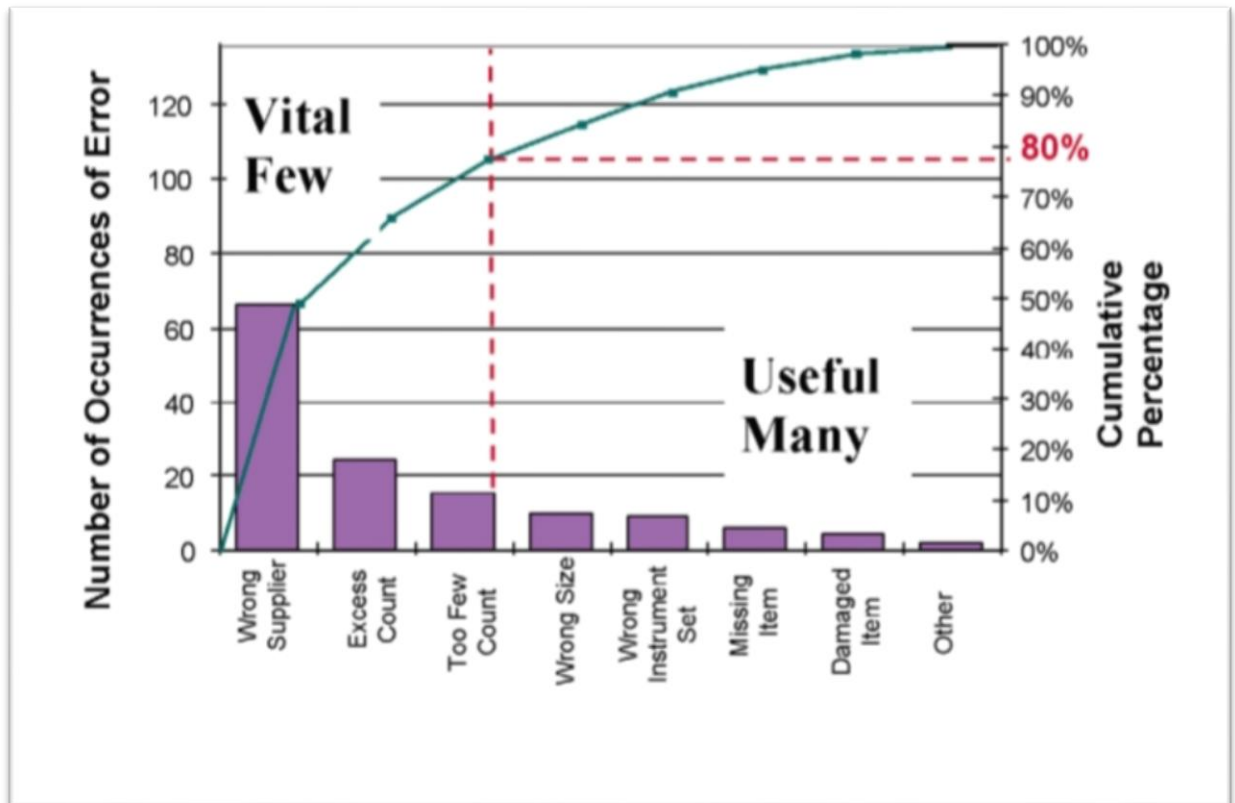
Table N°1: Types of Errors Discovered During Surgical Setup

| Error type | Frequency | percent | Cumulative % |
|------------------------------|------------|------------|--------------|
| Wrong Supplier | 67 | 46.5 | 46.5 |
| Excess Count | 24 | 16.7 | 63.2 |
| Too Few Count | 17 | 11.8 | 75 |
| Wrong Size | 10 | 6.9 | 81.9 |
| Wrong Sterile Instrument Set | 10 | 6.9 | 88.8 |
| Missing Item | 8 | 5.6 | 94.4 |
| Damaged Item | 6 | 4.2 | 98.6 |
| Other | 2 | 1.4 | 100 |
| TOTAL | 144 | 100 | |

Source: www.health.state.mn.us

¹² https://www.health.state.mn.us/communities/practice/resources/phqitoolbox/docs/paretodiagram_ihi.pdf
2004 Institute for Healthcare Improvement. consulted on March 29th at 22:06

Graph N°02: Pareto Diagram: Types of Errors Discovered During Surgical Setup



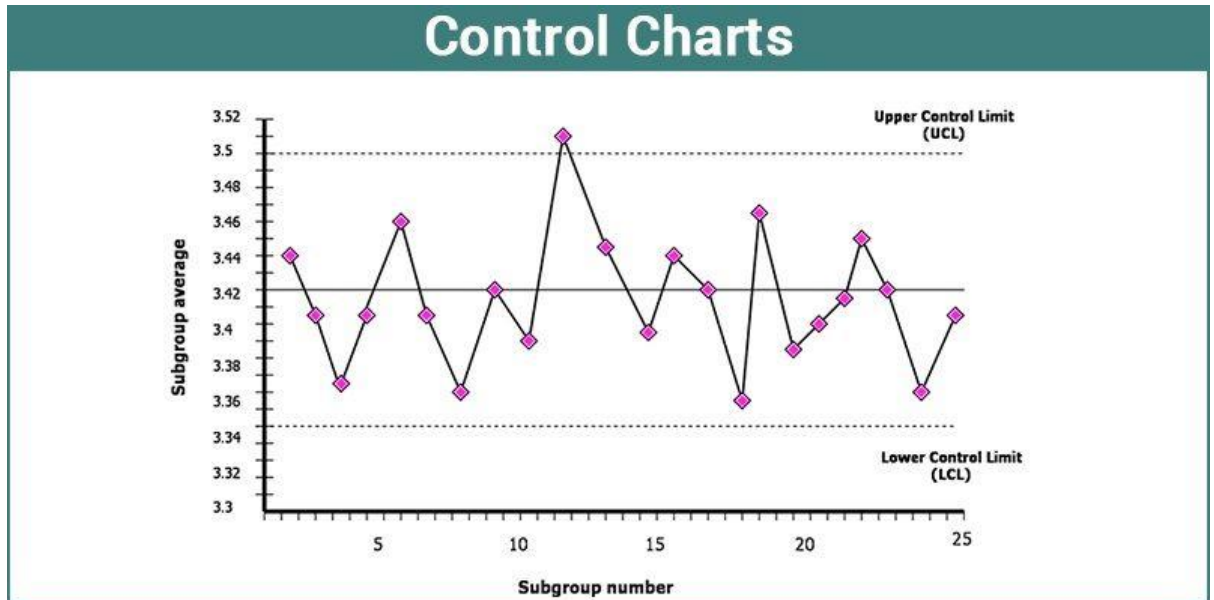
Source: www.health.state.mn.us

1.2.1.1.5 Control charts:

Control charts, also known as control charts, essentially consist of a set of statistical control limits. These limits are used to determine the status of a profile:

- Normal profile: This is the profile that does not conflict with the control limits, indicating that the process is under control.
- Abnormal profile: This is the profile that conflicts with the control limits, indicating that the process is out of control, or infected. This prompts us to investigate the reasons for the infection.

Graph N°03: Control chart



Source: <https://byjus.com/maths/control-charts/> Consulted on March 29th at 22:22

1.2.3 Quality Assurance:

Having embraced the principles of Taylorism, Henry Ford was able to increase efficiency by promoting assembly line work in the automobile industry, which led to mass consumption and productivity gains. The Second World War propelled the defense industry into mass production, fostering quality improvement initiatives such as:¹³

The publication of the « *military standards* » norms to define product quality in 1940 and the quality management training program developed in 1942 by Deming and Juran for use in armament factories.

The post-war period marks the beginning of a new era of mass production, corresponding to mass consumption or the standardization of products remains the only solution to meet customer needs, giving customers the choice to identify their expectations to satisfy them. Companies are faced with the need to reconcile two questions: either quality is defined by the customer, how then to know it in a mass market? Or quality is defined by the company, how then to reconcile mass production and the multiplicity of consumption choices?

¹³ CHELBI Thiziri "Management de la qualité un facteur déterminant pour l'amélioration de la compétitivité des entreprises" master's thesis. Abderrahmane MIRA University of Bejaia. 2019. Page 11

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The birth of marketing, which helps in the fictitious construction of a representative customer of the average individual customers and their needs; as well as the emergence of the concept of quality assurance, provide an answer to this dilemma.

The definition of quality assurance is « *the set of appropriate, pre-established and systematic arrangements intended to instill confidence in the consistent attainment of the required quality* ». ¹⁴

This symbolizes the quest for balance between considering the customer, whom one wishes to instill "confidence," and the necessary organization of mass production through the implementation of pre-established and systematic arrangements. The centralizing nature of the quality assurance approach, as well as the numerous procedures, sometimes lead to a certain bureaucratic drift, masking the objective of aligning production with customer expectations.

1.2.4 Total Quality:

Throughout the 20th century, quality management evolved from quality control to Total Quality Management (TQM) under the influence of scientists such as Juran, Taguchi, Crosby, Ishikawa, and Deming. From the 1970s onwards, the concept of *Total Quality* emerged. It translates into Total Quality Control (TQC) or the Japanese concept of *Company Wide Quality Control* (CWQC). With the upheaval that came with the crisis, quality became a subject of communication and reflection. ¹⁵

Today, known as TQM (*Total Quality Management*), this managerial theory aims at pursuing excellence. Excellence here is both an individual model guiding us towards minimal errors and a collective model that can be applied to the entire organization, which then continuously seeks improvement. Improvement is the central concept of TQM, embodied in Deming's wheel, referred to as PDCA (Plan, Do, Check, Act), which later becomes a guide for all quality initiatives: Plan, to prepare and plan; Do, to develop and execute; Check, to control and verify; Act, to act, react, and adjust. By definition, « *Total Quality, for a company, is a policy that aims to the permanent mobilization of all its members to improve: the quality of its products and services, the quality of its operations, and the quality of its objectives, in relation to its environment* » ¹⁶ It is clear that this is a logic of continuous

¹⁴ CHELBI Thiziri "Management de la qualité un facteur déterminant pour l'amélioration de la compétitivité des entreprises" master's thesis. Abderrahmane MIRA University of Bejaia. 2019. Page 12

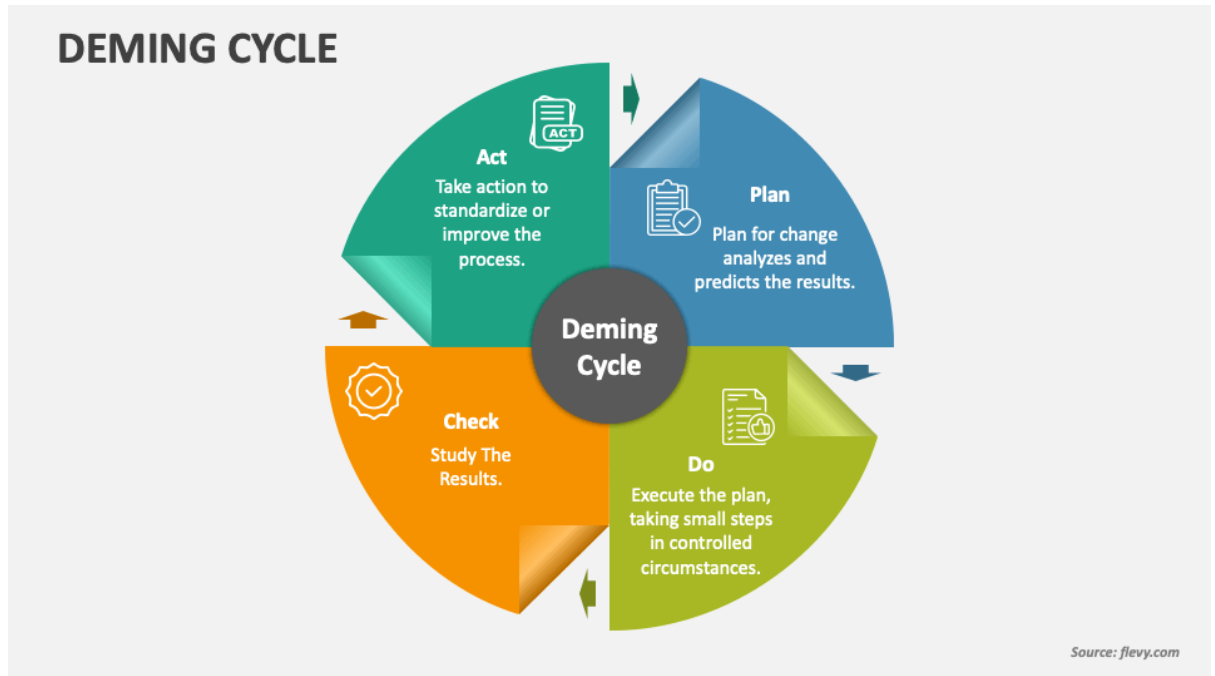
¹⁵ MEZIANI Mustapha « la gestion de la qualité par la certification et la compétitivité des entreprises : cas de l'EPB », Magister's Thesis, Abderrahmane Mira University of Bejaia, 2004, page, 7.

¹⁶ **ibid**

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improvement that concerns, in a way, all services or processes of the company, even if they are not directly related to the product. The following figure shows the Deming cycle ¹⁷

Figure No. 4: Deming cycle



Source: www.collidu.com/presentation-deming-cycle

- Plan (Plan): This step involves planning based on customer objectives (input), production context, and customer feedback. It involves setting objectives, standardizing work procedures, and training employees.
- Do: This involves carrying out what the company has planned by using its resources. It requires performing the work in accordance with the plan's requirements.
- Check: According to Deming, the third step involves checking for any deviations in the products (outputs). The company must verify the conformity of the work performed with the plan.
- Act: Finally, Deming's wheel suggests making the process more robust and, if possible, more efficient. In case of non-conformity, it involves identifying and eliminating the root cause of the problem.¹⁸

¹⁷ <https://www.collidu.com/presentation-deming-cycle>. Flevy.com. Consulted on March 28th 2024 at 22:32

Section 2: Conceptual framework of quality management

Starting from the 2000s, quality management shifted into the era of total quality management, marked by significant changes with the 2000 and 2008 versions of the ISO 9001 standard. « *The scope broadens to include a process approach with a strengthened focus on the customer* »¹⁹ meaning that the application of quality extends to other functions of organizations such as marketing, R&D, etc., whereas in the last century, quality only concerned the product or service sold, achieved through controlling activities related to manufacturing. Quality management covers the requirements of quality assurance but also integrates the notion of continuous improvement of the quality system.

With the transition from quality assurance to a higher stage of quality management, organizations have realized that total customer satisfaction is not only generated by quality products, but that there are other elements that make a difference. Today, « *Our customer wants everything; they want it to be beautiful, inexpensive, and immediately available* »²⁰

2.1 Definition of quality management:

The definition of quality management or total quality has been adopted by AFNOR as:²¹

« *A management approach of an organization centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction and benefits for the members of the organization and for society.* »

This means that total quality relies particularly on personnel, focuses on processes, and is based on customer satisfaction through the implementation of a quality policy.

According to ISO 9001 versions 2000, quality management can be defined as:

¹⁸ AIBOUD Yasmine, DJOUAHER Ouiza (*Développement des compétences dans le cadre d'une démarche globale de la qualité. Cas de l'entreprise Nationale des Industries de l'Electroménagers.*) Master's thesis in Human Resource Management at UMMTO. 2020. Page 13

¹⁹ BAZINET (M), NISSAN (D) et REILHAC (J-M), Au cœur de l'ISO 9001 :2015 : Une passerelle vers

²⁰ YVON Mougou, Op.cit, p.19. Excerpt from the thesis of MERAZI Meriem Abir- CHIBANE Kherdine (*Le rôle du capital humain dans le management de la qualité Etude de cas : ATM Mobilis*). Master's thesis in Management at Abderrahmane Mira University of Bejaia. 2019. page 10

²¹ Roger. ERNOUL. Op. Cit, page10. Excerpt from the Thesis of CHELBI Thiziri "*Management de la qualité un facteur déterminant pour l'amélioration de la compétitivité des entreprises* "master's thesis. Abderrahmane MIRA University of Bejaia. 2019. Page 14

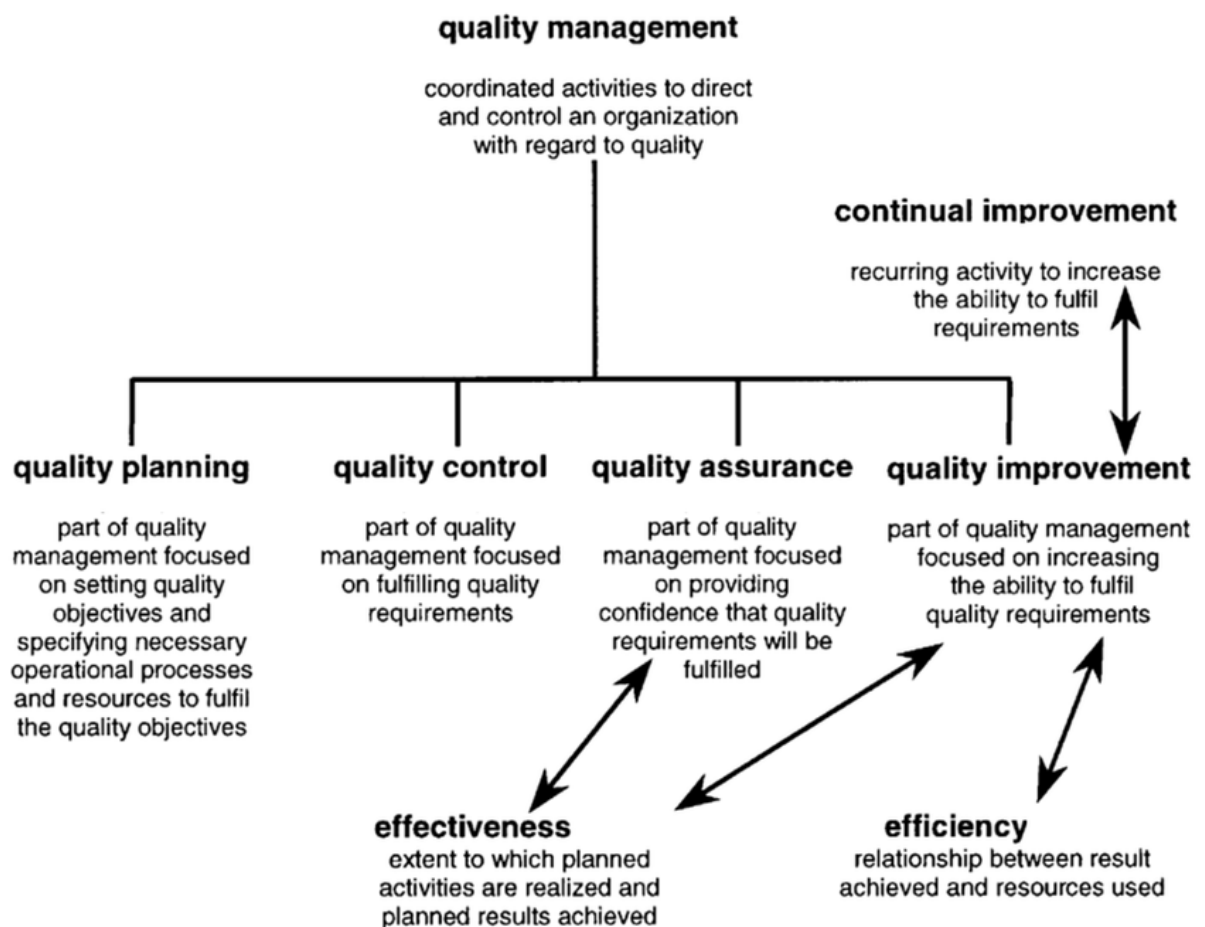
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« A set of activities of the general management function that determines the quality policy, objectives, responsibilities, and means such as planning, assurance, and quality improvement within the framework of the quality system. »²²

This implies that the control of the organization regarding quality primarily involves quality policy and objective quality, planning, assurance, and quality improvement, which constitute both the components and missions of quality management.

The following figure shows an overall explanation of quality management²³.

Figure N°05: Quality management



2.2 Management quality principles:

The international experts of the ISO/TC 176 Technical Committee have defined eight quality management principles, which are elaborated in the ISO 9000:2000 series.

Here they are as stated in these standards:²⁴

²² www.iso.org consulted on March 29th at 14:54

²³ https://www.researchgate.net/figure/Quality-management-concepts-34_fig3_300319076 Consulted on March 30th at 00:42

2.2.1 Customer-focused Organization:

Organizations are dependent on their customers; therefore, it is important for them to understand their current and future needs, meet their requirements, and strive to exceed their expectations (by establishing a communication system).

2.2.2 Leadership:

The leaders establish the purpose and direction of the organization; they should create and maintain an internal environment where people can fully engage in achieving the organization's objectives.

2.2.3 Involvement of People:

People at all levels are the essence of an organization, and their full involvement enables their abilities to be used for the organization's benefit.

2.2.4 Process Approach:

A desired outcome is achieved more efficiently when related resources and activities are managed as a process.

2.2.5 System Approach to Management:

Identifying, understanding, and managing correlated processes as a system contributes to the effectiveness and efficiency of the organization in achieving its objectives.

2.2.6 Continuous Improvement:

It is essential that the continuous improvement of the overall performance of an organization be a permanent objective of the organization.

2.2.7 Factual Approach to Decision Making:

Effective decisions are based on the analysis of data and information. This means that management must ensure the reliability of the information and data to make relevant decisions.

2.2.8 Mutually Beneficial Suppliers Relationships:

An organization and its suppliers are interdependent, and mutually beneficial relationships enhance the capabilities of both organizations to create value.

²⁴ CHELBI Thiziri "Management de la qualité un facteur déterminant pour l'amélioration de la compétitivité des entreprises" master's thesis. Abderrahmane MIRA University of Bejaia. 2019. Page 16

All these are shown in figure n°06.²⁵

Figure N° 06: Management Quality Principles

8 Basis Of Quality Management Sample PPT Presentation



2.3 The Main Components of Quality Management:

The means used in quality management encompass everything the company must do, operationally, to implement the quality policy and achieve internal and external quality objectives.

These components are:²⁶

2.3.1. Quality planning:

Planning is one of the essential components of management; « *to govern is to plan.* »²⁷
In the field of organizations, various types of planning can be distinguished:

²⁵ <https://www.slidegeeks.com/business/product/8-basis-of-quality-management-ppt-powerpoint-presentation-shapes> Consulted on March 30th at 01:58

²⁶ CHELBI Thiziri "Management de la qualité un facteur déterminant pour l'amélioration de la compétitivité des entreprises" master's thesis. Abderrahmane MIRA University of Bejaia. 2019. Page 17

²⁷ BERNARD. FROMAN. Op. Cit. P, 141-142. Excerpt from CHELBI Thiziri "Management de la qualité un facteur déterminant pour l'amélioration de la compétitivité des entreprises" master's thesis. Abderrahmane MIRA University of Bejaia. 2019. Page 17

A. Strategic planning:

This planning prepares the implementation of management policy, which means: organizing the management system by specifying objectives and defining key processes and resources with a schedule; it is called:

- strategic management plan.
- quality action plan (QAP).
- quality and environmental management plan.

B. Specific Planning:

This type of planning specifies the elements of the management system and the resources to be applied in a specific case for a distinct sector of the organization. The corresponding document is called the "quality plan."

C. Operational Planning:

This involves various plans or programs, such as control or monitoring plans, schedules, and audit and intervention plans...

2.3.2. Quality Control:

In 1994, Arthaud provided a definition of control adapted from ISO: «*Control is the action of measuring, examining, testing, fitting one or more characteristics of a product or service, and comparing them to specific requirements in order to establish their conformity.*»

²⁸

Quality control, which refers to operational actions that allow both the steering of a process and the elimination of non-conformities compared to what is expected in the process.

Control is an operation of quality control at a given stage of the process considered to determine the conformity of the results obtained compared to the specified requirements.²⁹

2.3.3. Quality Assurance:

For an enterprise to satisfy its customers and ensure its performance, it must establish a system called quality assurance (QA). For this approach to be effective, it must apply to all

²⁸ Meriem. LAURENCE, Op. Cit, page, 22. Excerpt from CHELBI Thiziri "Management de la qualité un facteur déterminant pour l'amélioration de la compétitivité des entreprises" master's thesis. Abderrahmane MIRA University of Bejaia. 2019. Page 18

²⁹Ibid

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groups concerned with the organization's operation: customers (users, consumers), employees (working conditions, information), and suppliers (collaboration conditions).

This QA concept serves both internal and external objectives:

- **Internally:** QA aims to instill confidence in its strategy to the management and maintain the company's level of competence.
- **Externally:** It allows for gaining the trust of customers.

The claim for a Quality Assurance System (QAS) is driven by the attainment of standards or certifications that serve as official guarantees for the organization to satisfy its customers.

2.3.4. Quality Improvement:

ISO 9000:2000 defines quality improvement as: « *The part of quality management focused on increasing the ability to meet requirements for quality.* »³⁰

The 2000 version clearly implies demonstrating the effectiveness of one or more continuous improvement processes by measuring customer satisfaction. The goal is to understand customer requirements to serve them well.

The management should organize itself to create and develop improvement centers, such as quality circles, progress groups, problem-solving groups, progress processing, and taking corrective and preventive actions. These are all means to structure this continuous quality improvement (CQI) approach³¹.

When customer needs evolve rapidly, the organization's processes must adapt to them by continuously improving their efficiency. Therefore, continuous improvement is not limited to addressing customer dissatisfaction or implementing corrective or preventive actions. It is not solely evaluated in relation to non-quality; on the contrary, management must ensure it is an essential part of its strategic planning.³²

2.4 Quality Management Standards according to ISO:

The International Organization for Standardization (ISO) is a federation of national standards bodies founded in 1947 and comprising more than 140 countries. To this day, ISO

³⁰ www.iso.org on March 30th at 02:30

³¹ Abdelhamid. OUARET, « les dirigeants face à la performance de leurs entreprises : rôle de la direction dans un système de management de la qualité. » New edition, Algiers, 2009, page, 70

³² *Ibid.* P, 71

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has developed nearly 10,000 voluntary international standards, based on consensus, in almost every area of industrial, economic, scientific, and technical activity.

The ISO 9000 standards family reflects international consensus on good management practices. These standards ensure the delivery of products and services of consistent quality that meet customer expectations. These good practices have been distilled and classified into a set of normative requirements for a quality management system accessible to any organization.

The ISO 9000 family of standards is one of the greatest successes in the history of the International Organization for Standardization, and more than 80 countries have incorporated it into their national standards. The three main standards in this family are:³³

- ISO 9000: Serves as an entry point, introducing quality management systems. It consists of two parts:
 - « Terms and Definitions »: This part specifies various terms related to quality management and their definitions. In the quality domain, vocabulary is crucial, and many difficulties encountered in quality initiatives are often related to misunderstanding of terms and divergent interpretations.³⁴
 - « Fundamental Principles of Quality Management Systems »: This informative part aims to explain, in a simple and concise manner, the key concepts in quality management system standards. It serves as a useful tool for raising awareness and understanding the approaches developed in the ISO 9001 / ISO 9004 standards.
- ISO 9001: Specifies requirements for a quality management system. These requirements apply to any organization seeking to establish a quality management system when it:
 - Needs to demonstrate its ability to consistently provide products that meet customer requirements and applicable regulations.
 - Aims to enhance customer satisfaction through the effective application of the system, including processes for continuous system improvement and to ensure compliance with customer requirements and applicable regulatory requirements.³⁵

³³ AIBOUD Yasmine, DJOUAHER Ouiza (*Développement des compétences dans le cadre d'une démarche globale de la qualité. Cas de l'entreprise Nationale des Industries de l'Electroménagers.*) Master's thesis in Human Resource Management at UMMTO. 2020. Page 18.

³⁴ MATHIEU Stéphane, « Anticiper les normes ISO 9000 : 2000 », Edition Afnor, Paris, 2000, P. 22.

³⁵ NF EN ISO 9001 : 2000, « Système de management de la qualité – Exigences », Edition Afnor, Paris, P. 1

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The requirements of this international standard are generic and intended to apply to any organization, regardless of its type, size, or the product it provides.

- The ISO 9004 standard provides guidance on the effectiveness and efficiency of the quality management system. Its purpose is to improve organizational performance and customer satisfaction, among other interested parties.

This international standard is applicable to the organization's processes, and the quality management principles upon which it is based can be deployed throughout the organization. Its main objective is to achieve continuous improvement, measured through customer and other interested parties' satisfaction.

ISO 9004 is designed as recommendations, providing a comprehensive description of a quality management system and its constituent processes. It aims to improve an organization's processes, enabling it to enhance its performance.

These standards form a coherent set related to quality management systems and facilitate mutual understanding in national and international trade exchanges.

SECTION 3: Quality Management Approach

The implementation of quality management is linked to the organization's culture. It is carried out in ten important steps, allowing for the improvement of an organization's production quality and the alignment of its strategy. The quality management approach is structured as follows:³⁶

- The first step involves defining the organization's purpose, recognizing that each organization has its own purpose.
- The second step is to define and communicate the organization's policy/policies. This involves establishing a policy that defines short and medium-term objectives and clearly communicating this policy to the organization's personnel.
- The third step revolves around deploying coherent and measurable objectives, enabling the organization to implement its strategy.
- The fourth step involves determining the organization's processes, which are the sequences of coordinated activities to deliver the product/service. This involves grouping activities into processes, each of which utilizes resources (labor, methods, materials, equipment, environment). For example, the purchasing process, production process, sales process, etc.
- The fifth step involves defining the activities and sequences of integrated processes and formalizing them while respecting the complexity of these activities and the competencies of the personnel. Each process utilizes tools and methods for the development of their sequences.
- The sixth step defines the responsibilities of the processes. This involves forming a competent team to oversee the operation of processes in a manner that respects the established provisions.
- The seventh step involves defining process documentation, formalizing all planned operating arrangements for activities to ensure consistency of practices in case of personnel replacement or absence. Procedures should be simple and comprehensive.
- The eighth step is to define monitoring activities and measure process effectiveness, including control practices, audit applications, and indicators to achieve set objectives.
- The ninth step involves measuring and improving performance. Based on the analysis of results and non-conformities, considering all customer complaints and feedback,

³⁶ <https://www.qualiblog.com/> Consulted on March 30th at 03:28

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corrections can be made, and performance improved. It is also necessary to consult and involve the quality manager.

- The final step involves applying the principle of continuous improvement.

CONCLUSION:

In this first chapter, we have outlined the essential and indispensable points for a comprehensive understanding of quality management, and explained the main concepts related to our research subject.

In conclusion, quality management is essential for any organization wishing to thrive and maintain its competitiveness in the market. It encompasses principles, processes, and practices aimed at ensuring and continuously improving the quality of products and services. Quality is reflected in the ability to provide added value to those who use or benefit from the company's products or services. The quality management approach should be customer-centric, involve all members of the organization, and aim for long-term stakeholder satisfaction. Ultimately, quality is a key success factor in a customer-focused world and operational excellence.

INTRODUCTION:

The relationship between quality management and sustainable development has become increasingly significant in today's global landscape. Quality management, with its focus on continuous improvement, customer satisfaction, and efficient resource utilization, intersects with the principles of sustainable development, which aim to meet present needs without compromising the ability of future generations to meet their own needs. This intersection creates synergies and opportunities for organizations to integrate quality management practices with sustainable development goals, fostering environmental stewardship, social responsibility, and economic viability.

Quality management systems provide frameworks and methodologies for organizations to optimize their processes, enhance product and service quality, and minimize waste and inefficiencies. These same principles align closely with the objectives of sustainable development, which seek to balance economic growth, social equity, and environmental protection. By leveraging quality management practices, organizations can contribute to sustainable development by improving resource efficiency, reducing environmental impacts, and promoting social well-being.

In this context, the links between quality management and sustainable development are multifaceted and interconnected. They encompass environmental stewardship, social responsibility, ethical business practices, and stakeholder engagement. By integrating quality management principles with sustainable development initiatives, organizations can create value for both themselves and society, driving innovation, enhancing competitiveness, and fostering long-term sustainability.

In this chapter, we will explore the Conceptual framework of sustainable development (section 1) and the various interactions between quality management and sustainable development (section 2), highlighting how organizations can leverage quality management practices to advance sustainable development goals and address global challenges effectively.

Section 1: Conceptual framework of sustainable development

The degradation of the environment is the main cause of the emergence of the concept of sustainable development in the 1980s. This concept then quickly spread, to the point that it became the foremost global concept. Several conferences were held to address the concerns of sustainable development, among these conferences we cite the most well-known internationally, namely: the Club of Rome, the United Nations Conference on the Environment, the Rio Conference on Environment and Development, the Kyoto Protocol, and the World Summit on Sustainable Development.

1. Definition of sustainable development:

Since its emergence in the early eighties, the concept of sustainable development has been the subject of countless definitions¹. We will present three categories of definitions that seem to us to be the most relevant². The institutional category, the economic category, and the economic and environmental category. Or as classified by L. Guay, L. Doucet, L. Bouthillier, G. Debailleul in their works “The Challenges and Issues of Sustainable Development: knowing, deciding, acting”³ as typical ideal definitions that can be qualified as conservative, moderate, and progressive.

1.1 The 'economy' category.

In this first category of definitions, known as the economic category or the conservative conception: « *Sustainable development means that we must find a way to avoid terrible recession; sustainable economy would be an economy based on solid foundations.* » or « *Sustainable development is change, they must be ready to change continuously if you want it to last, it must change.* »⁴ This category of definition provides a representation for the concept of sustainable development without reference to the environment.⁵

The conservative conception of sustainable development economics emphasizes economic stability and the need to establish solid foundations for sustainable growth. According to this perspective, sustainable development is primarily about maintaining an

¹R.Anthony, D.Karen, A.V.Mérylle, Guide pratique de développement durable, éd. AFNOR,2005, P.235

² Excerpt from the thesis of Aissou Yacine and Amara zine eddine (L’impact de la numérisation sur le développement durable des entreprises CAS : Banque BADR (Bouira)). Master’s thesis in Management at Abderrahmane Mira University of Bejaia. 2022/2023.page 27, 28.

³ L.GUAY , L.DOUCET , L.BOUTHILLIER, G.DEBAILLEUL in the works « *les enjeux et les défis du développement durable : connaître, décidé, agir* », pub. University Press of LAVAL . Quebec, 2004, p.63

⁴ Sustainable Development: Values and Practices. Idem

⁵L.GUAY , L.DOUCET , L.BOUTHILLIER, G.DEBAILLEUL in the works « *les enjeux et les défis du développement durable : connaître, décidé, agir* », pub. University Press of LAVAL . Quebec, 2004, p.70

economy in continuous growth without major recessions. The main idea is that to ensure economic sustainability, it is necessary to avoid major economic crises and shocks.

1.2 The Economy and Environment Category.

The second type of definition interprets sustainable development as the combination of both environmental and economic aspects. In this category, sustainable development is seen as the harmony or balance between economic growth and the overall preservation of our resources. This definition emphasizes the relationship between the economy and the environment. In the first formulation, sustainable development is based on the idea of balance, but it is limited to economic and environmental aspects. In the second formulation, sustainable development is seen as recognizing the environmental dimension in economic decision-making. Therefore, according to this definition criterion, sustainable development involves complementing economic growth with environmental protection, unlike the first definition which overlooks the environmental dimension.

1.3 The Institutional Category.

The final category of definitions includes those that align most closely with the institutionalized definition of sustainable development, which emphasizes the conservation of resources for future generations.⁶

The most widespread and official definition of sustainable development is as follows: « *development that meets the needs of the present without compromising the ability of future generations to meet their own needs.* »⁷

2. Origins and Evolution of the Concept:

2.1 The emergence of the concept of sustainable development.

Sustainable development is a concept that originated internationally. It truly began in the 1960s with the first criticisms of the productivity growth model. The Club of Rome, an association of industrialists founded in 1968, led this movement.

In 1971, the 24 member countries of the OECD (Organization for Economic Co-operation and Development) proclaimed the polluter-pays principle.

⁶ L.GUAY , L.DOUCET , L.BOUTHILLIER, G.DEBAILLEUL (Le développement durable : valeurs et pratiques).P.239.

⁷ Edwin Zaccai, " RIO, le développement durable 10 ans après," Presentation at the conference series, at the City of Science, Paris, p1. Excerpt from the thesis of Benaissa SARA and Anarakdim YAMINA (Entrepreneuriat et développement durable : cas des PME de la commune de Bejaïa). Master's thesis in Entrepreneurship at Abderrahmane Mira University of Bejaia. 2017/2018.page 14

CHAPTER II: Links between quality management and sustainable development.

In 1972, they commissioned a study to a team from MIT (Massachusetts Institute of Technology) led by Dennis Meadows. These researchers then published a now-famous book titled "The Limits to Growth".

Faced with the overexploitation of natural resources linked to economic and demographic growth, this association advocated for zero growth: the only growth capable of reconciling exponential demographic evolution and limited natural resources.

In essence, economic development was presented as incompatible with long-term planetary protection. Alongside this, faced with the rise of social movements that largely integrated environmental concerns, the first environmental ministries were created within various national governments (1969 for the United States; 1971 for France).

In this confrontational rather than conciliatory atmosphere between ecology and economy, the United Nations Conference on the Human Environment was held in 1972 in Stockholm, Sweden. The central themes of the conference were:

- The interdependence between humans and the natural environment
- The links between economic and social development and environmental protection
- The need for a global vision and common principles

Figures like Maurice Strong, organizer of the Conference, and later Professor René Dubos, Barbara Ward, and Ignacy Sachs, emphasized the need to integrate social equity and ecological prudence into economic development models of both the North and the South. This led to the creation of the United Nations Environment Program (UNEP) and the United Nations Development Program (UNDP). The concept of eco-development was then highlighted.

But as time went on, civil society became increasingly aware of the urgency of establishing global solidarity to address major disruptions in natural balances. Thus, during the 1980s, the general public became aware of acid rain, the ozone hole, the greenhouse effect, deforestation, and the Chernobyl disaster!

Public opinion was sensitized to the "climate problem", especially by the risk of ozone layer destruction. This movement was launched at the Montreal conference by banning CFCs. This was a significant symbolic victory. The ozone layer problem was presented as a founding myth. Even if complete proof was never provided, the global population believed it. Other phenomena developed such as biodiversity, the precautionary principle – the burden of proof does not belong to the accuser, risk management.

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By 1980, IUCN (International Union for Conservation of Nature) mentioned Sustainable Development for the first time. But the term went largely unnoticed.

In 1983, the UN asked Ms. Gro Harlem BRUNDTLAND (former Prime Minister of Norway) to chair an independent commission to investigate the issue of global environment and development.

In 1987, this commission submitted the so-called "Brundtland Report", titled "Our Common Future". This report introduced a fundamental shift in governments' conception of the relationship between the environment and public policies and advocated for the concept of "sustainable development".

Echoing these themes, the World Commission on Environment and Development (the Brundtland Commission) publicly released a report in 1987 asking for development that allows us to: "meet the needs of the present without compromising the ability of future generations to meet their own".

The definition is part of the modifications made to the General Auditor's Act, which led to the creation of the Commissioner's position.

The Brundtland Commission further stated that "... Sustainable development is not a fixed state of harmony, but rather a process of evolution in which the exploitation of resources, the direction of investments, the advancement of technological development, and institutional transformations are all in harmony with both our current and future needs."

Since then, the concept of sustainable development has been adopted worldwide.

In June 1992, at the first "Earth Summit" organized by the United Nations, the term "sustainable development" was officially endorsed. 170 heads of states and governments signed an action plan for the 21st century: Agenda 21, which sets out its objectives.⁸

2.2. Club of Rome.

The Club of Rome is an international association founded in 1968 that brings together prospective think tanks. It was founded by Italian Aurelio Peccei and gathers scientists, economists, businesspeople, senior officials, and politicians.⁹ They regularly meet to study

⁸ https://www.actu-environnement.com/ae/dossiers/dd/dd_naissance_2.php4#:~:text=Depuis%20cette%20date%2C%20le%20concept.de%20d%C3%A9veloppement%20durable". Consulted on April 24th, 2024 at 19:21

⁹ Y. Veyret : Le développement durable. Ed. Essedes, Paris,2007, Idem.P.24. Excerpt from the thesis of Aissou yacine and Amara zine eddine (L'impact de la numérisation sur le développement durable des entreprises CAS : Banque BADR (Bouira)). Master's thesis in Management at Abderrahmane Mira University of Bejaia. 2022/2023.page 30.

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issues related to the future of humanity (such as the overexploitation of natural resources, demographic pressure, and waste growth).

Over the years, the Club of Rome has produced a number of reports, the first of which was titled « The Limits to Growth » or « The Meadows Report » in 1972, named after Dennis Meadows, the research group's director. The report analyzed the relationship between economic and ecological limits and their relation to demographic growth. Its main conclusion is that « the pursuit of material growth will sooner or later lead to the collapse of the world around us, leading to a significant degradation of living conditions. »¹⁰

In parallel, the work of international experts has explored the multiple interactions between the environment and economic growth, showing that it is possible to conceive and implement socio-economic development strategies while are fairer and more environmentally friendly.¹¹

The Club of Rome marks the first step in defining the foundations of sustainable development.

3.The three pillars of sustainability: environmental, social and economic:

Sustainable development within a company can be approached from various perspectives.¹² These primary dimensions are often organized around the three pillars of sustainable development, as illustrated in Figure No. 7.

¹⁰ Y. Veyret. Idem. P.24.

¹¹ E. Guingand, A. Jounot : le développement durable et l'entreprise : un déficit pour les managers. Ed. AFNOR, France ; 2004,P.7. Excerpt from Idem.

¹² <https://www.enel.com/company/stories/articles/2023/06/three-pillars-sustainability> Consulted on April 15th, 2024 at 00;18

Figure No. 7: The Three Pillars of Sustainable Development



Source: <https://www.gevme.com/en/blog/the-three-pillars-of-sustainability/> consulted on April 15th, 2024 at 22:13

3.1 environmental sustainability.

Environmental sustainability refers to the capacity to maintain and safeguard the natural environment over the long term by implementing suitable practices and policies, ensuring that current needs are met without endangering the availability of resources for future generations.

In another definition, environmental sustainability is the responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing, now and in the future. Because so many decisions that impact the environment are not felt immediately, a key element of environmental sustainability is its forward-looking nature. In fact, the U.S. Environmental Protection Agency defines it as “meeting today’s needs without compromising the ability of future generations to meet their needs.”¹³

3.1.1 Factors that impact environmental sustainability.

Some important factors can have a serious impact on the environmental sustainability by influencing the ecological balance and the planet's ability to sustain life. Some of the main ones include:¹⁴

¹³ [Environmental, Social and Economic Sustainability | Enel Group](#). June 15th, 2023. Consulted on August 02nd, 2024 at 15:25.

¹⁴ [Environmental, Social and Economic Sustainability | Enel Group](#). June 15th, 2023. Consulted on August 02nd, 2024 at 15:25.

- Pollution: water, air and soil pollution.
- Climate change: the impact of climate change on ecosystems, weather patterns and natural resources.
- Biodiversity: the preservation of diverse ecosystems and species.
- Natural resources depletion: the sustainable use of natural resources such as water, forests and energy sources.

3.1.2 Key Objectives for Achieving Environmental Sustainability.

In order to achieve environmental sustainability, the following crucial objectives stand out:¹⁵

- Preserve and protect natural resources.
- Climate change mitigation.
- Promoting sustainable development by achieving economic growth while ensuring social equity and justice, and protecting the environment.
- Ensuring accountability and enforcement mechanisms to prevent environmental degradation, protect vulnerable communities, and promote sustainable practices.
- Integrating environmental considerations into decision-making.
- Support marginalized communities.

A critical practice for achieving sustainability involves conserving and responsibly managing natural resources such as water, soil, forests, wildlife and habitats. This ensures the ecological balance of our planet and keeps these resources available for future generations.

3.2 Social sustainability.

Social sustainability centers on ensuring human well-being, community engagement, social justice, human rights, stakeholders well-being, and creating effective social and cultural development in balance with the Earth's ecological system.

The goal of social sustainability is to ensure that humans have what they need, now and in the future.¹⁶

¹⁵[Environmental, Social and Economic Sustainability | Enel Group](#). June 15th, 2023. Consulted on August 02nd, 2024 at 15:25.

¹⁶[Environmental, Social and Economic Sustainability | Enel Group](#). June 15th, 2023. Consulted on August 02nd, 2024 at 15:25.

3.2.1 Key Objectives for Achieving Social Sustainability.

The United Nations Sustainable Development Goals (SDGs) provide a comprehensive framework for achieving social sustainability with specific targets like:¹⁷

- No poverty.
- Quality education.
- Gender equality.
- Decent work and economic growth.
- Reduced inequalities.
- Peace, justice, and strong institutions.

The goal of social sustainability is to create a society where all individuals have the opportunity to thrive, with access to essential resources, services and opportunities, and where businesses and communities work together to promote social justice, equality, and well-being.

3.2.2 Key dimensions for Social Sustainability.

- Improving quality of life by ensuring access to healthcare, education, employment, security, and economic accommodation.
- Fighting inequalities.
- Taking advantage of the benefits of diversity.
- Ensuring effective governance and democratic processes that allocate resources and prioritize sustainability initiatives.

3.3 economic sustainability.

Economic sustainability is a multi-faceted concept that requires businesses to balance financial performance with environmental and social considerations. By adopting sustainable practices, organizations can achieve long-term growth, reduce costs, and enhance their reputation. However, overcoming barriers to entry, lack of regulation, and focusing on the short term will be critical to widespread adoption of these practices.

Economic sustainability is when an activity or practice helps to achieve long-term financial growth without ignoring the environment, community, and social factors.¹⁸

¹⁷ [Environmental, Social and Economic Sustainability | Enel Group](#). June 15th, 2023. Consulted on August 02nd, 2024 at 15:25.

3.3.1 Key points of economic sustainability.

- Reduces current expenses.
- Promote sustainable consumption.
- Better resource management.
- Integration of waste into a second line of production or sales channel.
- Open more doors for success in other pillars of sustainable development (social and environmental).

3.3.2 Key Objectives for Achieving Economic Sustainability.

To implement an economic sustainability strategy, a several tips can be followed such as focusing on reducing environmental effects for a more healthy, sustainable long-term environment, setting financial goals to help a company decide how to increase profits and provide benefits, focusing on team members by creating competitive wages and benefits packages to increase the staff's satisfaction, and working with other businesses and organizations.

3.4 The links between the pillars of sustainability.

The three pillars of sustainable development are closely tied to each other in certain ways like for example economic sustainability is interconnected with social sustainability, as economic growth and development can either promote or exacerbate social inequalities. A fair and equitable economy is essential for social sustainability. Secondly, social sustainability is essential for environmental sustainability, as social factors like community engagement, education, and cultural values can influence environmental behaviors and decision-making. Finally, Economic and environmental sustainability are also intertwined, as economic activities can either harm the environment or protect it. Sustainable economic practices, such as circular economy and green technologies, can promote environmental sustainability.

3.5 The ESG Integration Strategy.

ESG integration involves incorporating environmental, social and governance factors into investment decisions. This strategy evaluates companies using non-financial metrics related to their environmental impact, social responsibility, and governance practices.

¹⁸ [Environmental, Social and Economic Sustainability | Enel Group](#). June 15th, 2023. Consulted on August 02nd, 2024 at 15:25.

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By evaluating a company's policies, actions and performance in these areas, ESG integration aims to identify sustainable investment opportunities that provide positive financial returns and societal and environmental outcomes. For example, Enel pioneered a bond tied to its ESG performance in 2019.

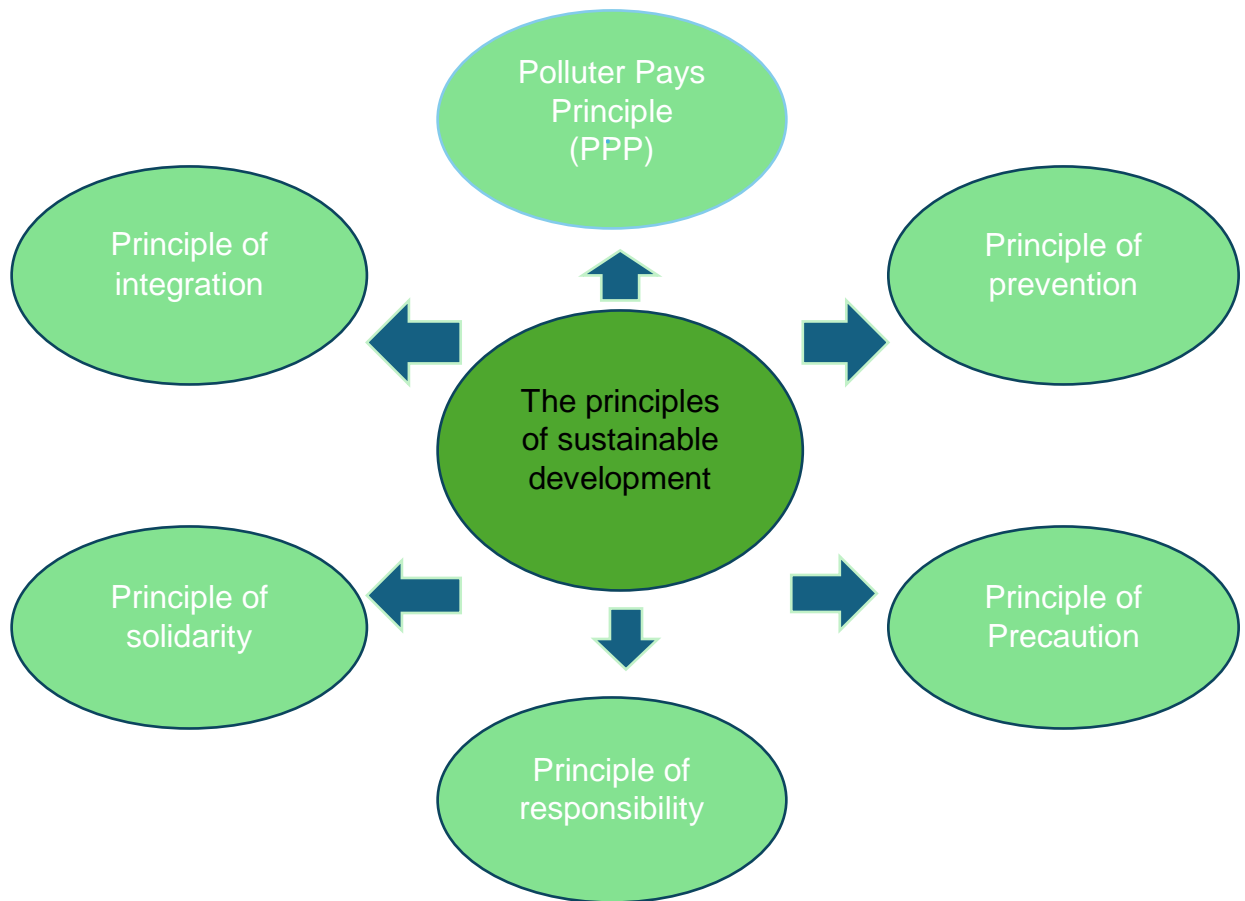
4. The principles of sustainable development.

Sustainable development encompasses several principles that have been adopted in international conferences, such as the Stockholm Conference in 1972, which established 26 principles, and the Rio Conference in 1992, which set forth 27 principles¹⁹. Notable among these are the polluter pays principle, prevention principle, precautionary principle, responsibility principle, solidarity principle, and integration principle²⁰ as it's shown in figure N°8.

¹⁹ A. Kerdoum : Environnement et développement durable : enjeux et défis. Édition. Publique, 2000, p.196. Excerpt from the thesis of Aissou yacine and Amara zine eddine (L'impact de la numérisation sur le développement durable des entreprises CAS : Banque BADR (Bouira)). Master's thesis in Management at Abderrahmane Mira University of Bejaia. 2022/2023.page 38, 39.

²⁰ Idem

Figure N°8: The principles of sustainable development.



Source: Established by us

4.1 Polluter Pays Principle (PPP).

The polluter pays principle (PPP) is a widely accepted framework that assigns responsibility and costs of pollution to those who cause it. This principle is based on the idea that those who cause environmental harm should bear the costs of preventing, mitigating or remediating that harm.

4.2 Principle of prevention.

The Principle of Prevention is a cornerstone of health and safety management, aimed at reducing risks and hazards in the workplace. It is a best practice approach to risk management, prioritizing measures to eliminate or minimize risks before they occur.

Among the key aspects are the following:

- Eliminates risks whenever possible.
- Replacing hazardous materials, equipment, or processes with safer alternatives.
- Engineering controls.

- Administrative Controls.
- Continuously evaluate and monitor risks.

4.3 Principle of Precaution.

The Precautionary Principle is the fifteenth principle of the Rio Declaration on Environment and Development in 1992. According to this declaration: « In the case of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation. »²¹

4.4 Principle of responsibility.

The principle of responsibility is the seventh principle of Rio Declaration in 1992, it's one of the major principles discussed by international, environmental conferences.

This principle aims to take responsibility for damage to the environment and to repair it.

4.5 Principle of solidarity.

The principle of solidarity is a socio-ethical and political concept that emphasizes the fair and just sharing of benefits and obligations among members of a society.

Key aspects include:

- Sharing
- Humans are fundamentally connected, and this connection creates a sense of responsibility towards others.
- Each individual has dignity and worth, no matter what their social or economic status are.
- Responsibility.

4.6 Principle of integration.

The principle of integration is a concept that appears in various contexts, including environmental law, education, and philosophy. The principle of integration stipulates that caring for the environment is everyone's responsibility, and all entities, especially industrial companies, at the national, regional and international levels, must apply and adhere to the rules and standards related to the environment. In order to preserve the environment, achieve economic efficiency, and ensure social justice, it is necessary to adhere to these principles alongside other principles to achieve sustainable development.

²¹ Principle 15 of the Rio Declaration in 1992.

5. Sustainable development challenges:

Sustainable development is something that can help the world's population and help provide security for future generations, but it is not without challenges. There are a number of challenges that should be faced must to achieve a better future.

5.1 War and instability.

When there is turmoil, instability and war between nations it stands to reasons that sustainable development cannot occur and that's related to frustrating situation in the damaged countries, almost all the sectors have been affected and have not even achieved the necessary goals, let alone sustainable development.

5.2 Suitability and availability.

Another issue relates to the state's ability to implement sustainable development programs in its country. It is common for developed countries to suggest to developing countries that the process they use in their country should be future-proof and sustainable, but this raises the question of whether this is possible first and secondly practical. For this reason, developing countries need subsidies and support from the developed world to help them reduce their commitments to unsustainable companies.

Sustainable development programs must be tailored to fit the local context. It must also take into account the current level of development reached by each country, and support it accordingly, so that it can implement competitive and beneficial sustainable development programs that do not hinder its development. There is no point in addressing global sustainable development issues at the expense of the progress and improvement witnessed by other developing countries.

In many cases where there are issues related to environmental degradation, it is important to introduce modern technologies that can help provide better synergies between the use of a country's resources and the sustainability of those resources.

5.3 Governmental issues.

Other issues relate to the initiatives that governments may wish to join, and the extent of their interest in sustainable development. Most governments are joining in on issues surrounding global warming and other climate issues, but not always.

In some cases, there is a political initiative to push back on environmental issues and sustainable development goals to address the immediate needs of its country or

CHAPTER II: Links between quality management and sustainable development.

population. For example, promoting and supporting old fossil fuel industries because they play a significant role in supporting disadvantaged communities and local areas. Closing some industries without replacing them can lead to job losses and poverty in some communities. In these settings, many governments are resistant to change related to sustainable development.

Ultimately, sustainable development must take place within the appropriate political climate in order for it to succeed, and sustainable development often does not succeed unless it delivers positive results for the government in question.

5.4 Poverty and unemployment.

One of the Sustainable Development Goals is to eradicate poverty, but this is not an easy task and cannot be achieved without addressing a number of other issues that contribute to poverty. Some of the issues relate to the economic inequalities and opportunities that people face. These inequalities may be between different countries. It is well known that people in developed countries tend to be (as a group) better off financially than individuals living in developing countries.

However, inequalities can occur within a country, and between men and women. Sustainable development programs, such as employment initiatives, often have equal opportunity objectives.

Social sciences look at how people interact with each other. Case studies and social scientific research by academics can help us understand the challenges facing a particular society and help us address these issues.

5.5 Global Economy.

The financial crisis that occurred after the Corona virus also had a negative impact on the Sustainable Development Goals. Due to the interconnectedness of global trade, there are many synergies between countries around the world, and what affects one country can also affect another country indirectly.

5.6 Population growth.

Population growth poses another potential challenge to sustainable development. As the world's population grows, more resources are needed to ensure that people stay out of poverty and have access to amenities such as fresh water and electricity.

6. Indicators of sustainable development:

Defined by the Brundtland report (1987) as « development that meets the needs of the present without compromising the ability of future generations to meet their own »²² the very definition of sustainable development is debated. Therefore, a number of tools were needed to measure this mode of development on a territorial scale.

In the early 1990s, indicators were developed to define units of measurement for sustainability and provide accurate, reliable and regularly updated information on the Sustainable Development Goals.

6.1 Definition of sustainable development indicators.

Sustainable development indicators are quantitative measures used to measure and track progress towards the Sustainable Development Goals. They simplify complex phenomena, making it possible to measure and communicate information about the state of the environment, economy and society.

The purpose of sustainable development indicators includes:

- Inform decision-making by providing data to governments, industries, non-governmental organizations and the general public to evaluate the effectiveness of sustainability strategies and policies.
- Tracking changes over time to evaluate whether development is becoming more sustainable.
- Encouraging organizations and individuals to assume responsibility for their environmental and social impacts.

²² OLIVIER Godard « L'inscription économique du développement durable », enjeux et politiques de l'environnement, cahier français N° 365, p.108. Excerpt from the thesis of TALBI Sarah (ENVIRONNEMENT ET DEVELOPPEMENT DURABLE DES TERRITOIRES : LA QUESTION DE LA GESTION DES DECHETS MENAGERS ET ASSIMILES : CAS DE LA COMMUNE D'AMIZOUR). Master's thesis in Economic Management, Territorial Management, And Entrepreneurship. at Abderrahmane Mira University of Bejaia. JUIN 2014.page 10, 11,12.

Section 2: Interactions between quality management and sustainable development

Quality management and sustainable development are closely linked concepts that share common goals of continuous improvement and long-term value creation. Quality management focuses on meeting customer expectations and regulatory requirements through efficient processes and continuous improvement. Sustainable development aims to balance economic growth, social equity, and environmental protection. The integration of sustainability into quality management practices can lead to reduced environmental impact and improved stakeholder relationships. Conversely, quality management provides the framework to effectively achieve sustainability goals. Together, they offer a holistic approach to excellence and a sustainable future. In this section, we will explore the various interactions between quality management and sustainable development.²³

1.Integrating Quality Management and Sustainability:

Both quality management and sustainability management aim to ensure long-term success and prosperity. Quality management focuses on meeting customer needs and continuously improving operations, while sustainability seeks to balance economic, social and environmental responsibilities.

Among the important key connection, we find that the focus of quality management on creating value for customers is aligned with the sustainability goal of creating long-term value for stakeholders and the planet.

Also, the iterative improvement process of quality management can be applied to sustainability efforts, allowing organizations to adapt and evolve in response to changing sustainability pressures.

Quality management's focus on understanding customer needs can contribute to sustainability efforts by identifying stakeholder concerns and priorities.

To integrate sustainability, organizations can weave its principles into their quality and management frameworks. By doing so, they can leverage existing systems and leverage quality management tools and methodologies to efficiently achieve sustainable outcomes.

²³ <https://www.qualitymag.com/articles/97789-when-sustainability-and-quality-meet#:~:text=One%20way%20to%20implement%20sustainability,%2C%20and%20decision%2Dmaking%20processes.> By [Tariq Masud](#) .Consulted on April 16th, 2024.

Although sustainability and quality may seem different, their underlying goals and characteristics often overlap. Viewing them as interconnected can help organizations achieve their quality and sustainability goals more effectively.²⁴

2. Areas where Quality & Sustainability Converge:

Quality and sustainability initiatives share several points in common:²⁵

- Reducing costs and risks: Both focus on reducing waste, reducing energy consumption, and optimizing resources to achieve economic benefits.
- Redesigned Products and Processes: Sustainability and quality both emphasize the importance of innovative, efficient, and environmentally friendly design and operation.
- Value creation: both strive to create long-term value for stakeholders, whether through quality products or services or sustainable practices.

Strategic alignment and integration between quality and sustainability initiatives is critical to achieving successful convergence. To achieve convergence, organizations should:

- Integrate sustainability and quality as core values into its strategic planning, ensuring that both are an integral part of decision-making processes.
- Use existing quality management systems and methods to achieve sustainability goals, leveraging existing frameworks and expertise.
- Embed environmental, social, and economic considerations into quality management operations, strategy, and decision-making processes.

Some notable examples of convergence include:

- DLF Offices: As a leader in sustainable commercial spaces, DLF has achieved LEED Platinum and LEED Zero Water certification, demonstrating the integration of quality and sustainability principles into building design and operations.
- Chief Sustainability Officers: Like Chief Quality Officers, Sustainability Officers must lead organizational efforts to institutionalize sustainable practices and ensure executive support and implementation throughout the organization.

²⁴ <https://www.qualitymag.com/articles/97789-when-sustainability-and-quality-meet#:~:text=One%20way%20to%20implement%20sustainability,%2C%20and%20decision%2Dmaking%20pr ocesses.> By Tariq Masud . Consulted on August 02nd, 2024 at 13:18

²⁵ <https://www.qualitymag.com/articles/97789-when-sustainability-and-quality-meet#:~:text=One%20way%20to%20implement%20sustainability,%2C%20and%20decision%2Dmaking%20pr ocesses.> By Tariq Masud . Consulted on August 02nd, 2024 at 13:18

Organizations can leverage existing quality management systems and methods to achieve sustainability goals, promoting a holistic approach to quality and sustainability.

One way to implement sustainability is to integrate environmental, social, and economic considerations into an organization's existing quality and management processes, strategy, and decision-making processes. This integrated approach suggests that organizations can achieve increased efficiency and cost savings if they leverage existing management systems and use quality management approaches (methods and tools) to achieve sustainability goals.

Because the concepts of sustainability and quality appear to have different goals, many organizations choose to implement them in silos. However, when we look at the commonalities between the features and goals of quality and sustainability initiatives, it makes sense to look at them holistically and implement sustainability by leveraging established and well-established quality management principles and approaches.

3. Areas where Quality and Sustainability may Not Directly Converge:

3.1 Environmental Sustainability:

In the past, environmental sustainability was often viewed as a separate goal. However, the integration of globally recognized standards, such as ISO-9001 (for quality management systems) and ISO-14001 (for environmental management systems), has shown that it is possible to build on existing processes that a team is familiar with through its own quality management system. Rather than starting from scratch, it is sufficient to integrate environmental management requirements into the quality management system, turning it into a quality and environmental management system (QEMS). Thus, it is possible to implement common elements of both management systems.

Beyond ensuring environmental compliance, management system can also be structured around additional standards like ISO-50001 (Energy Management System) and ISO 37101 (Sustainable Development in communities). These standards can help organize the environmental sustainability program into specific subareas, effectively complementing the organization's Quality Management.

Intelligent organizations leverage quality tools to assess their current performance against the environmental goals they aim to reach. Tools such as Process Decision Charts, Process Maps, Relationship diagrams, checklists, Pareto charts, stratification templates and many more can be utilized to achieve, monitor and display environmental sustainability

results along with the quality of both products and processes. Employing quality methods and tools to foster environmental sustainability is not only possible but has also been successfully implemented by many organizations.²⁶

3.2 Social Sustainability:

The social dimensions of sustainability assess what is often referred to as “Quality of life”, which encompasses the overall well-being of society. Although this measure can be challenging, utilizing quality methods and tools for the decomposition of social sustainability into actionable and quantifiable steps that can be reported on for performance and excellence.

Social sustainability can be enhanced by improving public health and safety, reducing pollution levels, improving air quality, and facilitating community mobility through sustainability modes of transportation, such as car sharing and more accessible public transportation. All of these elements of sustainability have a direct impact on the social well-being of employees and stakeholder, and can be assessed and reported using proven quality tools.

Like environmental sustainability, ISO-26000 (Social Responsibility) and ISO-20400 (Sustainable procurement) are established standards that organizations can effectively adopt to enhance their current quality management systems. This implementation fosters improved collaboration among initiatives that were previously operating in isolation.²⁷

3.3 Economic Sustainability:

Economic sustainability involves practices that promote long-term economic growth while ensuring that social, environmental, and other dimensions of community well-being are not adversely affected. Among the three main facets of sustainability, this aspect is the most straightforward to monitor and report, as it aligns with the conventional approach to measuring business success solely through financial profits or losses.

²⁶ <https://www.qualitymag.com/articles/97789-when-sustainability-and-quality-meet#:~:text=One%20way%20to%20implement%20sustainability,%2C%20and%20decision%2Dmaking%20pr ocesses.> By [Tariq Masud](#) . Consulted on August 02nd, 2024 at 13:18

²⁷ <https://www.qualitymag.com/articles/97789-when-sustainability-and-quality-meet#:~:text=One%20way%20to%20implement%20sustainability,%2C%20and%20decision%2Dmaking%20pr ocesses.> By [Tariq Masud](#) . Consulted on August 02nd, 2024 at 13:18

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The assessment of economic sustainability, along with its ongoing monitoring and reporting, can also leverage quality tools and techniques that have been effectively utilized in managing quality and business management systems globally.²⁸

²⁸ <https://www.qualitymag.com/articles/97789-when-sustainability-and-quality-meet#:~:text=One%20way%20to%20implement%20sustainability,%2C%20and%20decision%2Dmaking%20processes>. By Tariq Masud . Consulted on August 02nd, 2024 at 13:18

CONCLUSION:

In conclusion, the integration of quality management and sustainable development offers a holistic approach to business operations. By aligning quality practices with environmental and social sustainability goals, organizations can enhance efficiency, reduce waste, and promote responsible practices. This synergy not only drives operational excellence but also contributes to long-term business resilience and contributes positively to society and the environment. Embracing this interconnected perspective ensures that businesses can thrive while making a meaningful and lasting impact on the world around them.

Incorporating environmental and social metrics alongside financial indicators is a contemporary shift in organizational management. This approach enables businesses to foster growth while ensuring the long-term viability of environmental and social systems. It embodies "systems thinking," fundamental to quality management and continuous improvement.

By adopting a quality management systems approach, organizations can harmonize all elements towards a unified goal. Utilizing best practices and established quality tools, businesses can effectively integrate social and environmental sustainability into their operations. Instead of treating sustainability, environmental care, and quality management as separate endeavors, organizations can unify them. This streamlines processes, enhancing overall business performance and paving the way for a more sustainable future.

Introduction:

ENIEM is a key player in the Algerian home appliance industry. ENIEM is one of the enterprises that have established a Quality Management System. The objective is to improve the quality of its products.

In this chapter, we will discuss the representative elements about ENIEM and the implementation of the quality management system. The objective is to find out the impact of quality management on ENIEM's sustainable development.

Section 01: General presentation of ENIEM.

In this section, we will present the general characteristics of ENIEM and its activities, taking into account its organization, history, strategies, and missions.

1. Briefing

ENIEM is a public company under Algerian law, established on January 2nd, 1983, following the restructuring of SONELEC. It was legally transformed into a joint-stock company on October 8th, 1989. Its share capital is 10,279,800,000 DA, entirely (100%) owned by the group "ELEC EL DJAZAIR." ENIEM has three (03) specialized manufacturing units, one (01) technical service unit, one (01) commercial unit, and a subsidiary wholly owned (100%) by ENIEM.

The subsidiary SANITARY, abbreviated as "ISEC " (Industrial Sanitary Equipment Company), is located in Miliana in the province of Ain-Défla. Its share capital is 485,000,000 DA. It specializes in the manufacturing and development of sanitary products (bathtubs, washbasins, kitchen sinks, and shower trays)

2. The missions and activities of ENIEM:

The overall mission of ENIEM's units is to manufacture, assemble, develop, and market household appliances.¹

2.1 General management:

Responsible for the company's strategy and development, it exercises its hierarchical and functional authority over all departments.

2.2 Operations Management:

a. Cold Unit

This unit specializes in the manufacturing of refrigerators, both small and large models, freezers, and storage coolers. The main activities of the unit include:

- Metal sheet transformation,
- Surface treatment and coating (painting and plasticization)
- Plastic and polystyrene injection
- Manufacturing of metal parts (condenser)

¹ ENIEM's internal document. Consulted on September 5th, 2024 at 21:04

- Insulation, thermoforming, and assembly.

b. Cooking and Air Conditioning Unit

The COOKING unit specializes in the manufacturing of various stoves, built-in ovens, cooktops, and range hoods. The models produced include:

- All-gas stoves with 4 burners made of stainless steel and enameled steel, and 5-burner stoves made of enameled steel.
- Ventilated built-in ovens.
- All-gas range hoods with 4 burners made of stainless steel and glass-ceramic (hood or pyramid style).

As for the Air Conditioning Unit, it specializes in the manufacturing of various air conditioners and air conditioning cabinets. In addition to these products, it also manufactures washing machines, water heaters, and natural gas radiators.

c. Technical Services Unit

This unit is responsible for providing technical services and the necessary support to production units, such as:

- Design and manufacture of tools and molds,
- Production of various spare parts,
- Calibration and verification of measuring instruments,
- Printing,
- Management of energy and fluids,
- Maintenance of buildings,
- Manufacture of pallets,
- Neutralization of industrial waste before discharge into the river,
- Transport of goods,
- Site surveillance and social services.

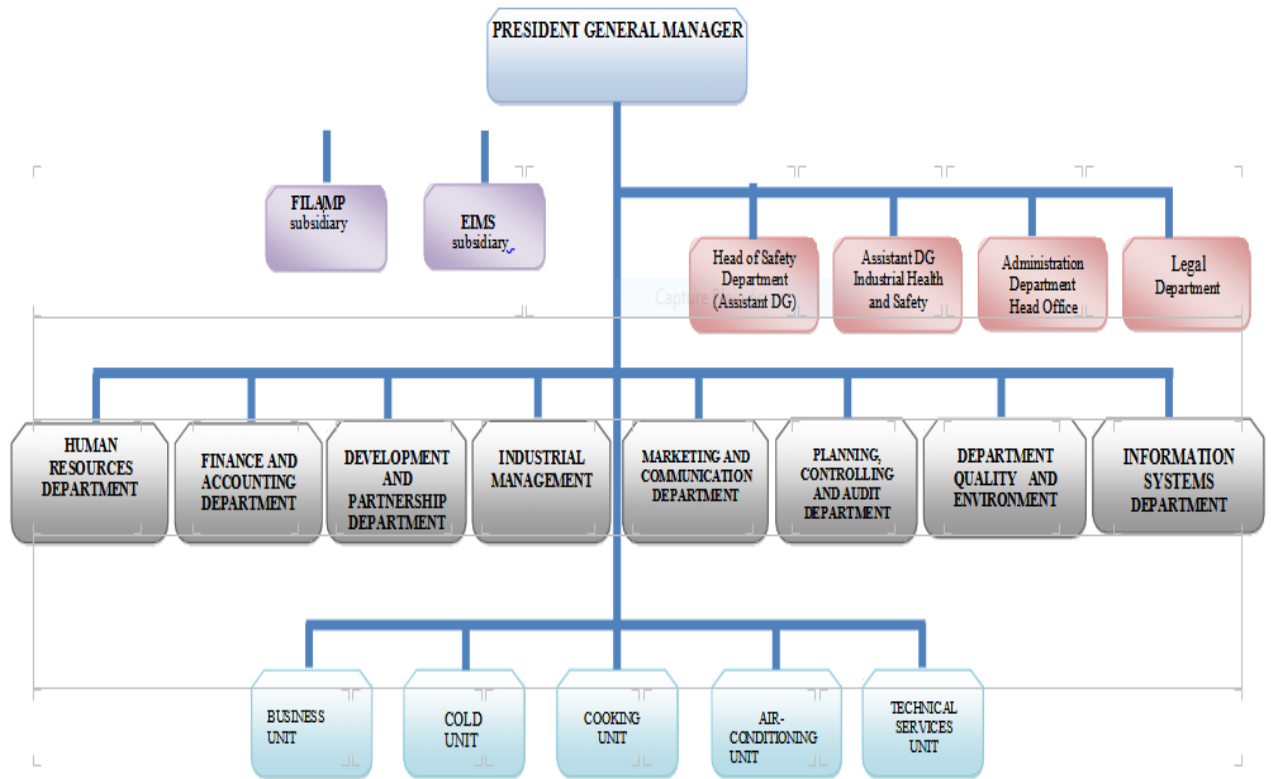
d. Commercial Unit

The COMMERCIAL unit ensures the distribution of ENIEM products, manufactured in the production units' workshops, to both national and international markets (export). It also provides after-sales service through its own resources and a network of authorized repair agents located throughout the national territory.

e. ISEC Subsidiary

The Industrial Sanitary Equipment Company is engaged in the production of sanitary products (bathtubs, sinks, washbasins, shower trays).

Figure N°09: ENIEM Organigram



Source: ENIEM's internal document

3. Permanent Staff of ENIEM:

Table No. 02: Permanent Staff of ENIEM in 2018

| Staff | Number |
|--------------|---------------|
| Executives | 331 |
| Mastery | 498 |
| Workers | 924 |
| Total | 1753 |

Source: Internal ENIEM's document

4. ENIEM background:

4.1 Understanding the organization and its context:

Management has identified its internal and external context using the SWOT method

Table N°03: SWOT method

| | | |
|-----------------|----------------------|-------------------|
| Internal | STRENGTHS | WEAKNESSES |
| | | |
| External | OPPORTUNITIES | THREATS |
| | | |

Source: ENIEM's internal document

4.2 Understanding stakeholder needs and expectations:

Management has identified the needs and expectations of its stakeholders in accordance with the following model:

Table N°04: Need and expectations of stakeholders

| N° | Relevant stakeholders | Needs and expectations |
|-----------|------------------------------|-------------------------------|
| 01 | Internal | |
| 02 | | |
| 03 | External | |
| 04 | | |

Source: ENIEM's internal document

5. Product ranges of ENIEM

ENIEM aims to meet the demand and expectations of customers for household appliances. To do this, it has committed to producing a range consisting of various products to meet diverse requirements. Each unit of ENIEM has a variety of products, some of which we can mention:

- Small model refrigerators
- Large model refrigerators such as:
- Freezers and coolers
- 4-burner and 5-burner stoves
- Air conditioners
- Washing machines
- Water heaters
- Heaters and radiators

SECTION 02: Quality Approach within ENIEM

It is given that quality management plays a vital role for organizations that want to grow and succeed amid competition in the market. Once again, regardless of whether an organization is producing products or delivering services, quality is considered a critical success factor. Companies employ processes of quality management for the purpose of improving efficiency, productivity, and profitability, and to meet customer expectations and requirements. In this section we are going to analyze the results of the field of QMS within ENIEM

1. The scope of the Quality Management System:

The scope of ENIEM's activities includes the design, manufacture, assembly, and marketing of household appliance, as well as the after-sales service.

1.2 Scope of application:

Given its areas of the activity and resources it employes, ENIEM meet all the requirements of the ISO 9001: 2015 standard.

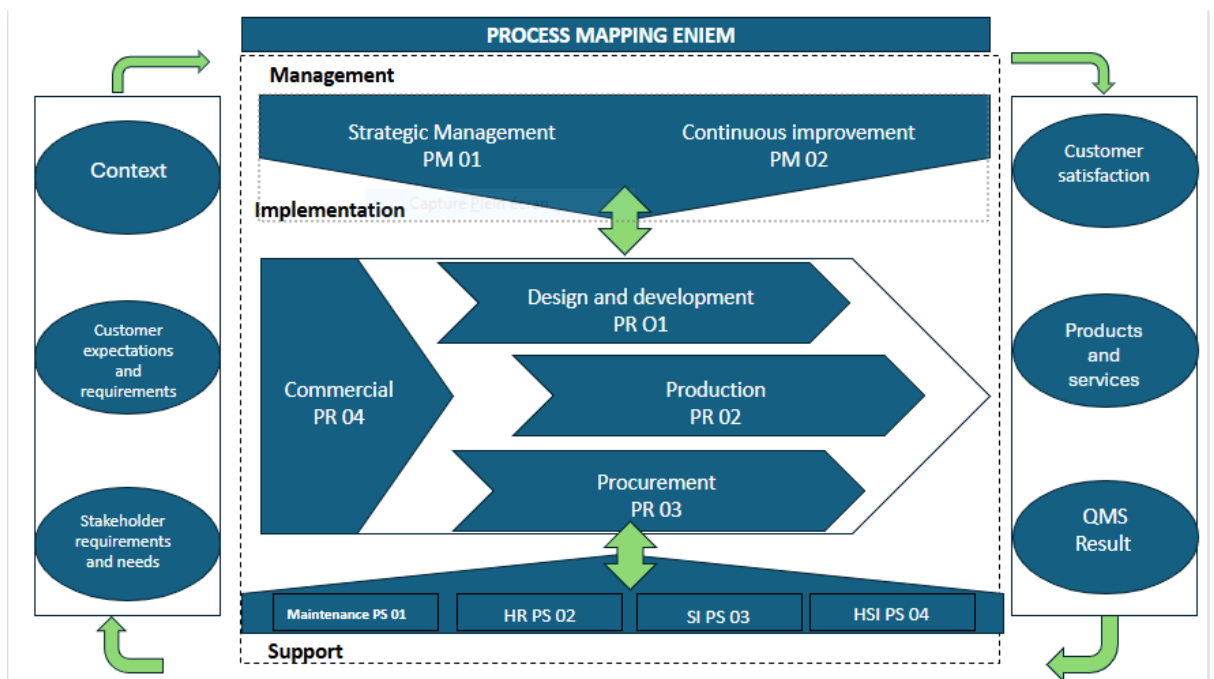
The sites covered by the Quality Management System are:

- The company headquarters in located at Boulevard Stiti, Tizi Ouzou.
- The home appliances complex situated in Oued Aissi industrial zone.
- The commercial unit located in the Oued Aissi industrial zone.

2. Quality Management System and its processes:

To meet the requirements of the ISO 9001: 2015 standard and enhance customer satisfaction, ENIEM has defined its processes and their interactions in a process mapping.

Figure N° 10: Process Mapping ENIEM



Source: ENIEM's internal document

Each process has a process identity sheet as shown below:

Table N°05: Process identity sheet

| | |
|-------------------------------|--|
| Process title | |
| | |
| Process typology | <input type="checkbox"/> Management |
| | <input type="checkbox"/> Production |
| | <input type="checkbox"/> Support |
| Purpose of the process | |
| Process manager | |

| | |
|--|---------------------------|
| | |
| Input data | Output data |
| | |
| Interactions with other processes | |
| Upstream process | Downstream process |
| | |
| | |
| Indicators | |
| | |
| Reference documents | |
| | |

Source: ENIEM's internal, document

3. Leadership:

3.1 Leadership and commitment:

3.1.1 General:

The development and improvement of a quality management system meeting the requirements of ISO 9001/2015 is a commitment for every member of ENIEM's management. This commitment is demonstrated by:

- Communication within ENIEM is key to meeting customer, regulatory and legal requirements.
- Politics and objective qualities.
- Conducting Management reviews.
- The provision of necessary resources.

3.1.2 Customer focus:

Management has taken steps to:

- Identify customer requirements.
- Meeting customer requirements.
- Manage customer relations.
- Measuring customer.

Our products are intended for the general public, and are distributed by authorized agents listed in the Sales Department.

3.2 Policy:

3.2.1 Establishing a quality policy:

The quality policy is based on:

- ENIEM's objectives which are:
 - Production and continuous improvements of product quality.
 - Reclaim its position as market leader in household appliances.
- The needs and expectations of its customers and stakeholders.

3.2.2 Quality policy communication:

To ensure that its policy is understood and implemented by all staff, ENIEM's quality policy is:

- Communicated and explained to all employees.
- Displayed in all company structures.

3.3 Roles, responsibilities, and authorities.

ENIEM has an organization chart showing the company's various structures.

The duties, authorities, and responsibilities of each person are set out in a document titled "Job description form".

4. Planning:

4.1 Actions to be taken in response to risks and opportunities.

An identification of risks and opportunities has been carried out for each process according to the model below, with an action plan to control critical risks.

4.2 Quality objectives and planning of actions to achieve them.

Quality objectives are set for each process, with a monitoring indicator for each objective.

4.3 Planning modifications:

Planning is carried out for any changes to the quality management system.

5. Support:

5.1 Resources:

5.1.1 General:

Management determines and provides the necessary resources for the operation and maintenance of the quality management system and the continuous improvement of its effectiveness, as well as increasing customer satisfaction by meeting their requirements.

The resources provided include people, infrastructure, work environment and financial resources. They are identified when the company's annual budget is drawn up.

5.1.2 Human Resources:

Each person called upon to perform a function within ENIEM must meet the requirements of the workstation to which he or she is assigned. The requirements for each position are defined in the job descriptions.

5.1.3 Infrastructure:

The company has:

- premises housing its head office and various central departments.
- premises housing the Unit Directorates
- storage facilities for raw materials and finished products
- manufacturing equipment
- control, measurement and test equipment
- product testing laboratories
- a documentation center
- a computerized management system with a network linking the various structures.
- a medical center
- restaurant

- a showroom
- after-sales repair workshops

Maintenance of equipment, machines and tools is carried out by the maintenance department of each unit.

Maintenance of buildings, handling and transport equipment, its systems and energy supply systems are carried out by the Technical Services Department.

5.1.4 Environment for process implementation:

ENIEM provides for the necessary measures to avoid any negative effects that affect the conformity of its products and the quality of its services, by ensuring an ergonomic working environment for all its personnel, namely:

- Personal protective equipment.
- Annual medical check-up.
- Suitable premises.

Awareness campaigns are conducted periodically by unit safety managers, and safety instructions are posted at workstations.

5.1.5 Resources for monitoring and measurement:

ENIEM uses measuring and control equipment to check raw materials, purchasing components, manufactured parts and finished products.

The control methodology is established in control plans.

- The controls carried out are essentially:
- Dimensional
- Performance
- Safety
- Physico-chemical

For ENIEM, control of measurement and monitoring equipment means that:

- Control measurement, and testing equipment are identified and made available to the user departments with a record sheet that tracks the history of interventions performed and anomalies reported on the equipment.

- Calibration and/or verification of control, measurement, and testing equipment are carried out regularly, either internally or externally, in accordance with the verification and calibration procedure, under the responsibility of the metrology department.
- Control, measurement, and testing equipment are maintained, preserved, and stored with all necessary precautions.

5.2 Skills

Skill requirements are defined on the basis of organizational charts, monthly activity reports, departure forecasts and requests expressed by the structures.

Skill requirements are met through recruitment, training, transfer or promotion. Profiles are collected on the basis of job descriptions.

Recruitment is carried out by submitting a job offer to the national employment agency (ANEM)

A training plan is drawn up annually, covering all ENIEM activities (human resources, finance, procurement, technical, studies and development, management and planning). And covering seminars, short courses and long-term training.

5.3 Awareness

- ENIEM ensures that its staff are aware of the following points:
- Quality policy
- Quality objectives
- The importance of ENIEM staff's contribution to the effectiveness of the QMS
- The repercussions of non-compliance with QMS requirements

5.4 Communication:

Aware of the strategic importance of internal and external communication in the operation and improvement of the QMS, ENIEM implements an internal communication process that aims to:

- Ensure top-down, bottom-up and horizontal information flows, as well as feedback.
- Ensure a fact-based approach to decision-making
- Stimulate every employee's need for information and education.

Internal communication within ENIEM is carried out in accordance with the ENIEM communication plan through:

- Quality committee meetings (Unit and company)
- Management board meetings (units and company)
- Signage in all structures and workshops.
- Raising staff awareness internally.

5.5 Documented information:

The main purpose of controlling all QMS documents (procedures, records, etc.) in all media (paper, IT, etc.) is to ensure that the documents used by ENIEM structures are those in force.

To ensure control of these documents, ENIEM has drawn up an QES 01 documented information control procedure.

This procedure makes it possible to control each type of document and identify the responsibilities inherent in this control.

Thus:

- Any ENIEM manager can take the initiative to propose the creation, modification or improvement of QMS documents.
- All QMS documents are :
 - Identified, drafted or modified, approved before distribution, stored in accordance with the control of documented information.

To ensure that only current versions are used, these documents are listed by the quality and environment manager in the QMS document matrix.

6. Operational activities

6.1 Operational planning and control

Planning concerns all of ENIEM's activities and translates into:

- Expressing your needs: Based on market trends (market research), sales achieved during the year and the needs expressed by our customers, the Sales Unit (SU) draws up a forecast sales program.

The CU submits this program to General Management for approval.

- Annual production program: Based on the sales program forecast, the technical feasibility and production capacities of the Units, and the resources available, the production and sales programs are approved by the Management Board.

The final production schedule is drawn up monthly by the Industrial Management Department and forwarded to the production units for implementation.

- Production Management (production units): Except for the air-conditioning unit, which is not connected to this system, it is based on a CAPM computer module.
- Scheduling – Launching: On the basis of the monthly production program, the scheduling structure determines machine loads and draws up manufacturing files for all production workshops.
- Supply planning: On the basis of the monthly production schedule, stock levels and new product specifications, the Inventory Management structure draws up a global procurement program.

6.2 Product and service requirements:

6.2.1 Customer communication:

Communication with customers is handled by the Sales Unit, through a variety of contacts (direct, telephone, website, trade fairs, etc.).

The Sales Unit responds to enquiries, draws up contracts and contract amendments, processes order, passes on product information to customers, communicates customer complaints, after-sales service feedback, customer needs and customer satisfaction internally.

6.2.2 Determining product and service requirements:

All standard product specifications are provided in the ENIEM product catalogs. Product requirements are identified through direct contact with customers or the provisions of the agreements binding them to ENIEM.

In addition to complying with legal and regulatory requirements (packaging, warranty, etc.), the customer's requirements include the following:

- The price
- Respect for quantity
- Compliance with technical specifications.
- Compliance with standards
- Meeting deadlines

- The delivery methods
- HSE compliance

6.2.3 Review of product and service requirements:

ENIEM reviews customer requirements before each order is processed, in accordance with the procedure for reviewing requirements and selling finished products.

6.2.4 Changes to product and service requirements:

ENIEM ensures that the corresponding documented information is adapted and that the personnel concerned are informed of modified requirements; when requirements relating to products and services are modified, this is done through the internal communication plan.

6.3 Product and service design and development:

6.3.1 General

Design and development at ENIEM involves improving existing products in categories B, C and D (see table below).

The changes introduced to the product have been prompted by:

- Business unit requirements (customer needs, competition, etc.)
- Modifications to components and materials
- Solving the problems encountered with older-generation products.
- Concern for improvement and integration
- Legal and regulatory requirements

The different types of design and development according to new product categories are shown in the table below.

Table N° 06: Types of design and development according to new product

| Category | Product type |
|----------|---|
| A | A product based on original design principles that the company has never produced before. |
| B | Products that incorporate new materials or components, or for reasons related to their manufacturing processes, in order to respond to market developments. |
| C | Products partially modified in terms of materials, parts, manufacturing and processes, to solve problems encountered in previous-generation products. |
| D | Partially modified products. |

Source: ENIEM's internal document

6.3.2 Design and development planning

- **Design and development stages:**

- Planning

- Design

- Industrialization

- **Review activities:** Reviews are carried out when user needs are identified, and when new input elements, during the output element design process and product qualification.
- **Responsibilities and authorities for design and development:** A project manager is appointed, with authority to manage the project. The contributions of the organizational functions to the design and development process are set out in the responsibility matrix.

6.3.3 Design and development inputs:

The input data are like the following:

- The needs expressed for the product with its specification.
 - Commercial specifications
 - Test specifications
 - Packaging and handling specification
 - Manufacturing specifications
 - Environmental specifications
- Applicable standards and normative documents
- Safety, reliability and maintainability requirements.
- Cost estimates
- Estimated delivery times.

These product requirements are expressed in the form of specifications, Reviews of the adequacy of this data are carried out to iron out any ambiguities and complete the requirements.

6.3.4 Mastering design and development

- **Design and development reviews:** Design starts with the needs of the requesting parties (marketing, DDP, manufacturing, purchasing) and ends with product validation. Reviews are carried out at all stages of the design process in accordance with the design and development procedure.
- **Design and development verification:** Design and development are verified through testing in accordance with the In-process Inspection and Test Procedures and Final Inspection and Test Procedures.

If the means of control do not exist at the company, the tests are outsourced.

- **Design and development validation:** Design and development are validated by the Development and Partnership Department in collaboration with the sales department and the unit concerned, on the basis of:
 - product validation test reports
 - customer feedback on the pilot production launch.

6.3.5 Design and development outputs:

Design and development outputs are presented in the form of documents that are reviewed and approved before release.

- List of new parts and/or parts to be modified
- Definition drawings
- Construction drawings
- Overall and sub-assembly drawings
- Technical data sheets for materials and products
- Production schedule
- Manufacturing and control ranges
- Instruction sheets
- Parts list
- Instructions for use
- Brochure
- Exploded views
- Technical and economic studies
- Test report on functional prototype
- List of required resources

Acceptance criteria (tolerances, limit values, etc.) are assigned by the design office for each component.

Incompatibilities and degrees of incompatibility are determined by the structure of the manufacturing methods.

Before launching a prototype, a computer simulation is used.

The summary of the selected design data is drawn up by the project manager.

6.3.6 Design and development changes:

Design and development modifications are carried out in accordance with the modification procedure.

6.4 Control of processes, products and services provided by external service providers In particular, ENIEM purchases:

- Raw materials and components.

- Equipment and tools for its production processes
- Spare parts for the maintenance of its production equipment.
- Various consumables.
- Subcontracting services.

ENIEM's purchasing is planned through the annual budget and the annual procurement plan, and is carried out in accordance with purchasing procedures.

These procedures include various commissions for opening bids, evaluating technical and commercial offers, and contract commissions (Unit and Enterprise).

Purchased products are checked for conformity before being put into stock or used, in accordance with acceptance procedures.

The purchasing process includes:

- Identifying needs
- Drawing up technical specifications.
- Consultation
- Technical evaluation of bids
- Supplier selection
- commercial evaluation of offers (cost of product purchased)
- Contract management
- Verification of purchased products

ENIEM ensures that purchased products comply with orders by controlling the following purchasing information:

- Acceptance criteria for products and services supplied
- Staff skills and qualifications (in the case of services)
- Product identification
- Documentation.

ENIEM carries out annual evaluations and re-evaluations of its suppliers according to well-defined criteria (quality, technical, commercial.), and verifies purchased products to ensure supplier status.

ENIEM establishes records of the verification of the purchased product, the communication with the supplier, and actions taken in the event of non-conformities to avoid the use of a non-conforming product.

ENIEM has outsourced a number of activities, including the transport of purchased and finished products for the procurement and sales processes, product repair under warranty, and certain infrastructure maintenance work.

- transport: rigorous monitoring is ensured by several entries on the service provider monitoring form when the contract is signed.
- Product repairs by authorized agents: a rigorous follow-up is ensured by the after-sales service (technical department) in addition to evaluation visits every two years
- Maintenance: attachments and status reports are available.

For all our subcontracted activities, we have set up a system for monitoring and tracking service providers, to ensure control over these activities.

6.5 Production and services

6.5.1 Control of production and service provision

a. Availability of product features: Product specifications (product data sheets, definition and assembly drawings, product and manufacturing BOMs) and work instructions (manufacturing and inspection routines, instruction sheets, operating procedures) are available from the following structures:

- Research/Development
- Manufacturing methods
- Scheduling
- Manufacturing
- Control

b. Availability and use of appropriate resources for monitoring and measurement. In each manufacturing workshop, quality inspectors and production controllers have at their disposal all the inspection and measuring equipment defined in the inspection plans. This equipment is calibrated at defined intervals in accordance with the schedule drawn up by the metrology department.

c. Implementation of measurement activities:

Two types of inspection are carried out during the manufacture of our products:

- Sampling control: Sampling of prefabricated and/or pre-assembled parts and sub-assemblies is carried out at all workstations and along assembly lines.

These checks are carried out by Product Inspectorate staff, in accordance with the statistical tables.

- 100% control: This 100% control is carried out by production staff (final assembly, surface coating, welding, etc.).
- d. Use of appropriate equipment
- Scheduling Launching: The appropriate equipment for the production of our products is defined in the manufacturing ranges. They are allocated to the production program via scheduling.
 - Equipment maintenance:

Our equipment is maintained:

- the manufacturer's instructions
 - to machine folders
 - maintenance procedures
- e. Validation of production and service preparation processes

The company's special processes are:

- Surface treatment and coating enameling
- Paint surface treatment and coating
- Metallization (Zinc plating, Nickel plating, Chrome plating)
- Welding components
- Foaming (insulation).

The working parameters used to obtain compliant parts are collected in a review, enabling the recipe and equipment to be validated by the technical and quality structures. Production managers ensure that these parameters are applied, by checking them at intervals defined in the review.

Staff working in this sector are qualified, and a certificate of qualification is attached to the person's file.

6.5.2 Identification and traceability

Inspection and control of raw materials and finished or in-process products is carried out by the production units' quality structures (material inspection, product inspection).

Control procedures (control ranges) are established to ensure that these operations are carried out correctly.

The manufacturing structure identifies the parts, assemblies, sub-assemblies and finished products inspected using a tracking sheet.

The finished product is identified by its serial number.

Production is monitored by the scheduling structures. The traceability of ENIEM products is not a customer requirement.

6.5.3 Owned by customers or external service providers

Devices handed in by our customers for repair or inspection are identified and protected by our after-sales service structures.

6.5.4 Post-delivery activity

ENIEM defines and implements processes for handling, storage, preservation and delivery to prevent damage, deterioration or misuse during internal processes and final product delivery.

These processes enable ENIEM:

- Ensure that handling and storage prevent alteration or deterioration of the product.
- Regularly assess the condition of the product in stock.
- Ensure that packaging complies with specified requirements.
- Ensure that measures are taken to protect product quality after final inspection.
- Ensure product protection during delivery, if this is a requirement specified in the contract.

6.5.5 Post-delivery activity

ENIEM complies with current regulations and customer requirements regarding post-delivery activities under warranty and contractual obligations.

6.5.6 Controlling modifications

ENIEM reviews production-related changes.

6.6 Release of products and services

Processes are managed and controlled by managers known as process drivers. Processes are monitored in accordance with the following provisions:

- All new equipment must be qualified before being put into service, and the same applies to recommissioning after any repair or technical modification.
- Positions with an impact on quality are identified
- Responsibilities are determined in accordance with the organization chart
- Process efficiency through planned and implemented internal quality audits
- Regular analysis of performance indicators.

Oversight and controls are carried out throughout the construction process and concern in particular:

- Meeting deadlines
- Compliance with standards,
- Compliance with specified technical requirements.

Compliance with acceptance criteria is attested in particular by:

- test reports
- analysis bulletins.

All records relating to product monitoring and measurement are kept.

6.7 Control of non-conforming output elements

Non-conforming products are identified, treated and, if necessary, isolated from other products. Appropriate treatment is carried out by applying the procedure for controlling non-conforming products.

7. Performance assessment

7.1 Monitoring, measurement, analysis and evaluation

7.1.1 General:

ENIEM implements a series of monitoring, measurement and analysis measures for all its product development and support activities (Human resources, maintenance).

All these monitoring, measurement and analysis activities are recorded.

7.1.2 Customer satisfaction

ENIEM gathers information on customer satisfaction and/or dissatisfaction and passes it on to the relevant managers for analysis.

7.1.3 Analysis and assessment

Complaints are analyzed and processed with the utmost rigor.

Customer satisfaction surveys are launched by the marketing department for each product.

7.2 Internal Audit

ENIEM's QMS audits are based on the requirements contained in this manual and in the quality system procedure. The functions to which the QMS audits apply are those responsible for activities that are significant for the quality of our products.

The scope of audits is determined by the importance of the activity in question and the knowledge of existing or likely problems.

The frequency of audits is determined by an annual audit program.

Audits are carried out by qualified individuals who have no direct responsibility for the area or activity being audited.

7.3 Management review:

Management reviews, scheduled at least once a year by the quality department, and placed under the responsibility of the Chairman and CEO. The purpose of management reviews is to identify any discrepancies between the defined quality policy, the requirements of ISO 9001-2015, and the existing QMS.

During a management review, the following points are addressed:

- Review the context
- Quality policy and objectives.

- Presentation of the results of internal and external audits, as well as the effectiveness of corrective and preventive activities.
- Presentation of product analysis results and process monitoring
- Analysis of customer complaints and their potential impact on the QMS.

8. Improving:

The dysfunctions observed give rise to improvement decisions such as:

- Changes in work organization
- Modification of production methods
- Investment in adapted equipment
- Staff training

ENIEM is constantly seeking to improve its QMS. To achieve this, it has a process for identifying and implementing all opportunities for improvement.

- Development of product, process and QMS performance indicators
- Product and process monitoring
- Periodic audits
- Dealing with non-conformities
- Data analysis
- Implementation of corrective actions
- Implementation of management reviews

Any identified non-conformity automatically triggers corrective action to eliminate its causes. The implementation and effectiveness of corrective actions are verified, analyzed and recorded in accordance with the corrective action procedure.

SECTION 03: The quality management system at ENIEM.

Quality management system also known as QMS is a set of processes and practices that a company uses to ensure that its products and services meet the highest level of customer satisfaction. The purpose of this section is to know the impact of QMS on ENIEM's sustainability, for that, we are going to analyze ENIEM's QMS data of two periods; the 2014-2017 period and the of 2020. We chose these two periods because of the important changes and events that happened between them so we can know how really the QMS impacts ENIEM's sustainability, or in another way, does really QMS has an impact on ENIEM's sustainability. To achieve such a result and given the difficulty of accessing information we need, we relied on two studies conducted during the respective periods while consulting a press view. Therefore, our method is qualitative.

1. ISO standards applied within ENIEM:

Since its creation, quality management has always held a central place within the company of ENIEM. The company began a certification process for its products in compliance with international standards. The standards that ENIEM apply it within its Quality Management System are: ISO 9001/2008, ISO 9001/2015. And ENIEM also has a certification for ISO 14001/2004 for its Environment Management System.

Starting with ISO 9001/2008, it is a quality management system standard, first published in 1987 by ISO. This standard is intended to assist organizations in fulfilling the requirements of both customers and stakeholders.

It outlines the criteria for a Quality Management System that an organization must meet to consistently deliver products that fulfill customer needs and comply with relevant legal and regulatory standards. The standard focuses on improving customer satisfaction by effectively implementing the system, which includes processes for current improvement and ensuring adherence to customer expectations and applicable regulations.²

Secondly, we have ISO 9001/2015, it's applied in the Quality Management System of ENIEM. In addition, ENIEM also provides a training on ISO 9001/2015.

ISO 9001/2015 establishes the requirements related to the Quality Management System.

² <https://pecb.com/whitepaper/iso-90012008-quality-management-system---requirements-> consulted on August 29th at 00:38.

Among the key changes in the ISO 9001/2015 standard, three cultural aspects are particularly notable: First, considering the company's context to ensure that the quality approach is more closely aligned with the company's strategy. Second, addressing risk, as each process will require identifying, prioritizing and implementing measures to manage risks. Third, managing knowledge, which involves defining the necessary knowledge for the company, providing access to it, deploying it, and organizing feedback.

ISO 9001/2015 also requires less paper documentation than previous versions and has fewer mandatory procedures (Paperwork burdens, advantages of reflection).

It allows flexibility in the "how" and simply encourages the leader to ask the right questions.

The new standards will no longer focus solely on customer satisfaction. It refers to "interested parties"; beyond just the customer, this term includes staff, suppliers, and partners essentially, everyone who is affected.

It is necessary to identify the "relevant" interested parties who could impact the organization's operations and the quality of its products and/or services.

In this way, ISO 9001/2015 can help in building stronger partnerships with suppliers.

Third, ENIEM has applied ISO 14001/2004 that is referred to Environment Management System in 2005.

In 2005, ENIEM aimed to achieve ISO 14001 certification within the year, reflecting its commitment to strict environmental standards. Marketing Director M.Boudjemai noted that, despite efforts, the company maintained a revenue of 5 billion dinars due to market stagnation and unfair competition from uncertified products. He also revealed that an Algerian importer attempted to produce water heaters under the ENIEM brand.

ENIEM held approximately 80% of the national refrigerator market, 60% of the stove market, and 35% of the air conditioner market. M.Boudjemai cautioned that these figures were approximate due to unreliable market statistics. Finally, CEO M.Yaddaden acknowledged the Land USE Planning and Environment for his contributions. ENIEM had previously achieved ISO 9002 certification in 1998 and ISO 9001 in 2003. ³

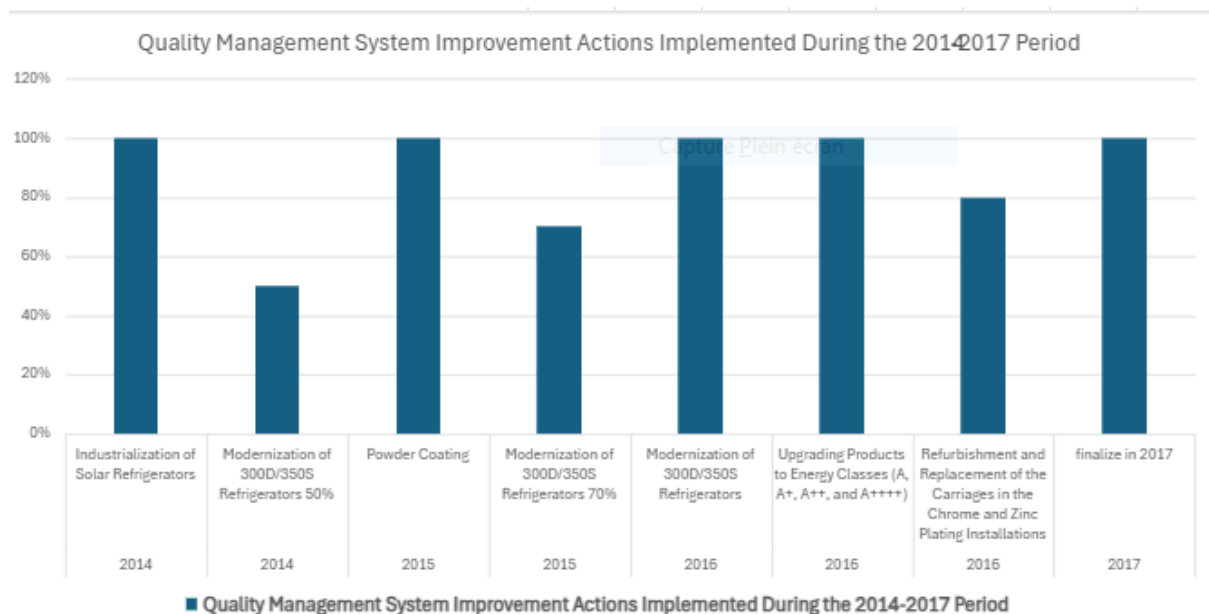
³ <https://www.depechedekabylie.com/13972-leniem-postule-au-certificat-iso-14-001/> by Djaffar C. Consulted on August 29th at 02:18.

2. Evolution of quality practices within ENIEM.

2.1 Evolution of QMS's actions implemented during 2014-2017 period

To optimize the quality of its products, ENIEM makes a strategic decision and set of actions in order to enhance continuously its processes and procedures. Commitment that can be well appreciated in the number of new projects initiated and continuous improvements. The following graph⁴ synthesizes the main actions that configure the Quality Management System, showing how environmental aspects have been introduced in its development.

Graph N° 04: Quality Management System improvement actions implemented during 2014-2017 period.



Source: QMS reviews 2015-2016-2017-2018

In this section, data given by the quality improvement efforts and actions incorporating environmental parameters shall be analyzed. Each effort in this regard shall be looked into for its integration into QMS and EMS. The detailed analysis goes us under:

⁴ QMS reviews 2015-2016-2017-2018. Developed based on the data collected and the 2018 EMS reviews. Excerpt from the thesis of AIT OUAHIOUNE Mouloud and BELAID Dehbia (Impact de la demarche qualite/environnement selon le referentiel iso sur la performance de l'entreprise dans le cadre de la problematique du developpement durable cas: eniem). Master's thesis in Marketing Management at MOULOU MAMMERI University of Tizi Ouzou. 2018/2019.page 135.

a. Solar Refrigerators industrialization (100% in 2014)

- **Objectives:** Full realization in 2014
- **Analysis:**
 - **Quality impact:** the full completion of this project means that ENIEM successfully introduced solar refrigerators into their production. This is an enhancement in respect to friendlier products for the environment using renewable technologies.
 - **Environmental impact:** Solar refrigerators are generally designed to be more energy-efficient and reduce the carbon footprint. The total completion of this project in 2014 shows successful integration of sustainability into new products.
 - **QMS/EMS:** Meeting the deadline reflects effective project management and good coordination between quality and environmental teams.

b. Powder Coating (complete realization in 2015)

- **Objective:** The goal was to fully achieve it in 2015
- **Analysis:**
 - **Quality impact:** Many plants use this process because it is resilient enough to resist wear and tear and gives a good finish. This transition probably improved the quality of its product to withstand wear and gave a better finish.
 - **Environmental impact:** This process is generally less polluting than traditional methods because it does not require chemical solvents. It produces less waste and fewer volatile organic compounds (VOCs).
 - **QMS/EMS:** This is a successful project, brought into action in 2015, signifying a commitment toward better and more sustainable practices for the improvement of quality and environmental aspects.

c. Modernization of Refrigerators 300D/350S (50% in 2014, 70% in 2015, 100% in 2016)

- **Objective:** The objective is fully realized in 2016
- **Analysis:**
 - **Quality impact:** Progressive modernization of refrigerators 300D/350S shows improvement in product performance and features.
 - **Environmental impact:** The modernization may entail improvements in energy efficiency that will cut down on energy consumption.

- **QMS/EMS:** The incremental approach and the certification of ISO 9001/2015 allows for testing and adapting improvements while maintaining product quality. Completion in 2016 shows that the objectives were successfully met.

d. Product Upgrade to Higher Energy Classes: A, A+, A++, and A+++

- **Objective:** Products shall be higher energy classes
- **Analysis:**
 - **Quality impact:** The upgrade to higher energy efficiency classes improves the perceived quality of products, as these comply with the consumer expectation in terms of better energy performance.
 - **Reduced environmental impact:** Products from class A to A+++ use less energy and emit less greenhouse gas. This is directly in line with the aims of minimizing environmental impact.
 - **QMS/EMS:** To include energy efficiency criteria in the development of products reflects a commitment to improvement within quality, taking environmental impacts into consideration.

e. Refurbishment and Replacement of Balancers in Chrome Plating Zinc Coating facilities (+80% in 2016, completion foreseen in 2017)

- **Objective:** Overhauling and replacement of balancers (80% in 2016 and to be completed in 2017)
- **Analysis:**
 - **Quality impact:** Refurbishing and replacing will lead to higher quality chrome plating and zinc coating facilities, hence better quality in the finish of a product and improved life thereof.
 - **Environmental impact:** Modernization of facilities could promote process efficiency, reduce resource consumption, and limit the production of waste.
 - **QMS/EMS:** Starting from the refurbishment phase and continuing, there seems to be an effort to maintain and enhance quality while integrating more workable environmental practices.

The quality improvement initiatives also focused on not just enhancing the quality but ensuring durable and efficient products. Much importance has been attached to integrating environmental criteria in new projects and process improvements. For example, powder

coating and energy efficiency enhancements demonstrate adherence to more environmental concerns. The efficiency in project management is manifested well in the ability to meet deadlines and progressive modernization. This reflects proper management and good coordination between the quality and environmental teams.

This reflects the strong commitment of ENIEM to continual improvement and communication process for quality, environment practices.

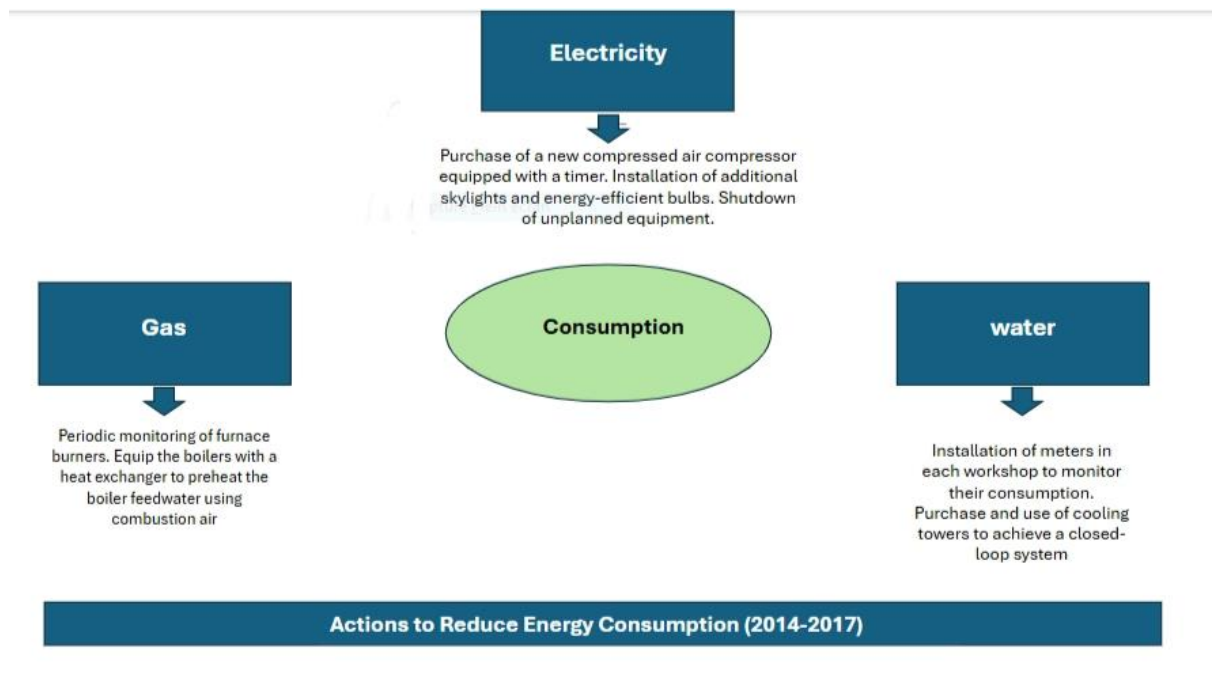
It would be worth continuing rigorous monitoring and evaluation of environmental impacts for new projects, which will help to achieve sustainability objectives. Ongoing training of teams in current best practices and technologies should also be ensured to optimize quality and environmental performance. Internal communication about success in the projects and environmental benefits will be critical to foster an enabling culture of sustainability and excellence within the organization.

2.2 Actions to reduce energy consumption

The following figure⁵ shows the actions that ENIEM has applied to reduce energy consumption during 2014-2017 period:

⁵ Developed based on the data collected and the 2018 EMS reviews. Excerpt from the thesis of AIT OUAHIOUNE Mouloud and BELAID Dehbia (Impact de la demarche qualite/environnement selon le referentiel iso sur la performance de l'entreprise dans le cadre de la problematique du developpement durable cas: eniem). Master's thesis in Marketing Management at MOULOUD MAMMERI University of Tizi Ouzou. 2018/2019,page 139.

Figure N° 11: Actions to reduce energy consumption during 2014-2017 period



Source: Developed based on the data collected and the 2018 EMS reviews

In this context, ENIEM through its Environmental Management System has developed various actions with the aim of reducing water and energy consumption. Synthesizing actions to reduce energy consumption 2014-2017.

Starting with electricity, we notice the following:

a. Buying of new compressed air compressor with timer

- **Objective:** The new compressor is meant to handle the compressed air in a manner that it has a timer to control its functions.
- **Impact:**
 - **Energy saving:** The compressor closed immediately when not in use; hence it avoids extra idle time, thereby saving energy consumption.
 - **Cost saving:** Effective compression of air can reduce electricity costs related to air systems.
 - **Longevity:** Proper timing can increase the life of a compressor by reducing its wear and tear.

b. Installation of additional skylights and energy-efficient Bulbs

The energy performance of the building has remarkably increased with the addition of new skylights as well as efficiency lamps. Utilizing skylights helps in minimizing the use of indoor artificial illumination during daytime periods. Furthermore, the use of energy

efficient bulbs minimizes power requirements as well as increases the service life of the bulbs. This strategy not only assists in reducing the lighting costs for electricity bills but also helps in the reduction of the total consumption of energy and lighting related carbon emissions.

c. Implementation of scheduled Shutdowns for Non-Essential Equipment

The purpose of scheduled downtime of switching off non-essential equipment is to make sure that equipment that does work, only works when it is required, thus avoiding wastage. This approach cuts wastes and unnecessary waste by switching the equipment off at non-operating hours. Since equipment usage is made to conform to the actual requirement of usage, this practice helps in energy efficiency but also improves efficiency of the entire operation.

Secondly, we have gas consumption. To control gas consumption, ENIEM has decided to take two main actions. The first one involves the follow-up of furnace burners periodically so that they are working properly and gas is not wasted. This regular service can enhance the adjustment of burners to be more affective in using gas besides avoiding situations that may call for excessive use or unnecessary wastage of gas or breakage of limbs. The second involves putting a heat exchanger on the boiler's inner side to recover heat from the combustion air and preheat the feedwater for the boilers. It optimizes the use of the heat then, by minimizing the feedwater temperatures, makes it possible to save gas and reduce fuel costs.

Third, we have water consumption. In order to improve water management, ENIEM undertook two important measures. First, the company installed meters in each workshop which provided exact information on the water consumption thus helping the company to manage and address where reductions in consumption could be done. This strategy also enhanced the management of expenses and promoted efficient utilization of water resources. Secondly, ENIEM decided to go for the construction of cooling towers which would create a closed loop by making water recirculate rather than being discarded. This system provides operational efficiency by decreasing the amount of fresh water consumed and American tower cooling towers also minimize any adverse environmental effects and improve cooling operation.

In short, the initiatives taken up by ENIEM indeed have helped in enhancing energy efficiency and cost reduction by optimizing electricity and gas consumption through better equipment and improved working practices. Not only do these measures reduce operation

costs, but they also enhance energy efficiency. Regarding water conservation, meter installation and installation of a closed-loop cooling system signify the concern of ENIEM to reduce water consumption and preserve resources. Taken together, these activities represent a holistic approach to environmental management that addresses several dimensions in resource use with very well-targeted improvement.

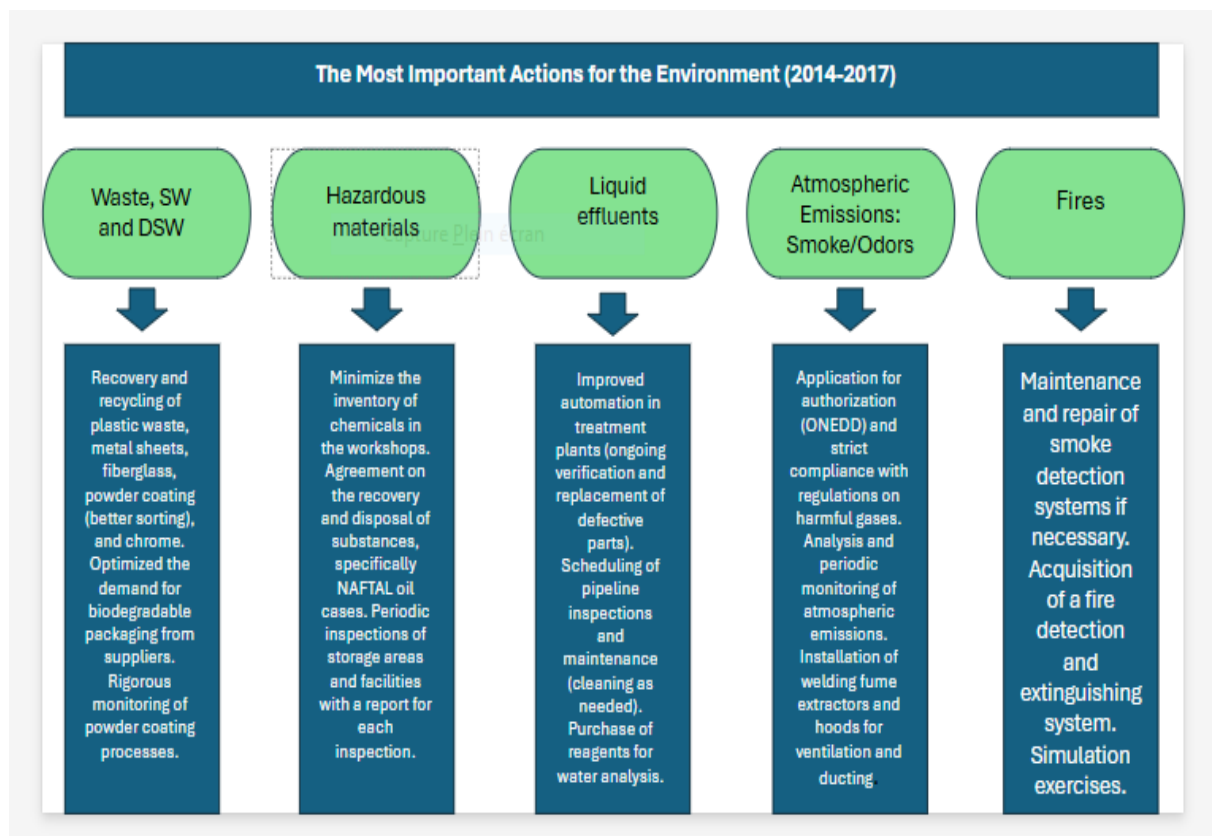
These concrete measures and recommendations testify to the commitment by ENIEM to the improvement of environmental performance through careful management energy and water resources.

2.3 Actions to improve the environmental performance

ENIEM's industrial operations release various substances that affect the atmosphere. To mitigate its environmental footprint, ENIEM implemented measures during 2014-2017. These practices are outlined in the figure N°12⁶ below.

⁶ revues SME et document HSI 2017-2018. Excerpt from the thesis of AIT OUAHIOUNE Mouloud and BELAID Dehbia (Impact de la demarche qualite/environnement selon le referentiel iso sur la performance de l'entreprise dans le cadre de la problematique du developpement durable cas: eniem). Master's thesis in Marketing Management at MOULOUD MAMMERI University of Tizi Ouzou. 2018/2019,page 140.

Figure N°12: The most important actions for the environment (2014-2017)



Source: EMS reviews and HSI document

- Waste management:** ENIEM has gone a step ahead in implementing innovative recycling techniques along with improved sorting practices for plastics, metal sheets, glass wool, powder coating and chrome. The improved recycling practice probably contributed to a substantial decrease in landfill waste and efficiency in the use of resources. This not only reduces the environmental footprint and raw material extraction processes when recycling these materials, but ENIEM also minimize waste disposal problems at landfills. With an increase in procurement of biodegradable packaging materials, the firm has contributed to wider sustainability objectives through reduced landfill waste and pollution. The process for powder coating, upon the introduction of rigorous monitoring, makes it efficient and reduces the waste and its footprint.
- Hazardous substances:** Eniem has taken steps to better handle hazardous substances. Limiting the number of chemical varieties at the workshops, the company reduces the risk of spillages and leakages, which is a greater danger to the environment and health. Implementation of a recovery convention, as was done for NAFTAL oil cases, ensures better handling of this matter by the company and reduces risks to the environment. Regular inspection and reporting on hazardous substance storage premises enable

problems to be addressed before they become real problems, meeting safety and environmental legislation requirements and avoiding potential problems in mishandling or storage.

- **Liquid Effluents:** By such a proactive approach, it ensures that wastewater is treated without getting released into the environment untreated or partially treated. Scheduled cleaning/maintenance of pipelines avoids blockage and leakage that causes environmental contamination. Acquisition of reagents for water quality analysis, therefore, will assist in continuous monitoring to ensure that such effluents meet the set regulatory standards before discharge.
- **Atmospheric Emissions:** Due care has been taken by ENIEM for the control of atmospheric emissions. The firm has obtained permission from ONEDD and also followed the legislation related to noxious gases, which reflects the commitment of the company towards the mitigation of atmospheric emissions and preservation of air quality. Through periodic analysis and control of the atmospheric emission, the same maintains within stipulated limits, hence decreasing the risks due to air pollution. Besides, with work area smoke extractors and ventilation hoods, the air will be of better quality and thus not as polluted with unhealthy fumes. This adds to a better quality of working environment.
- **Fire Safety:** Over the years, for firefighting ENIEM paid primary attention to regular maintenance and improvement of its firefighting detection systems, acquisition of new firefighting detection and firefighting means, and regular firefighting training. All of the above steps increase the effective work of the company regarding timely fire case detection and response and thus help minimize damage and injury. In this way, better preparedness and response can be achieved and improved through advanced fire safety equipment in regular practice simulation exercises that add up to overall safety and minimize the probable impacts of any fire-related emergency.

ENIEM's environmental management strategy is holistic, where sustainable use of raw materials and operational safety underpin the strategy. The environmental management implementation includes operational measures to reduce the consumption of raw materials, air and other emissions to control and ensure fire safety. Each action reduces environmental impacts but enhances efficiencies and safety within the operation. ENIEM seeks to reduce environmental impact, and moreover, ensure sustainability by demonstrating commitment through waste reduction, careful and responsible management of hazardous

material, and by implementing a compliance approach that fosters integrity in safety standards.

Basically, the analysis of QMS from ENIEM between 2014-2017 shows important impacts on business sustainability practices. During these years, several initiatives have been set up by ENIEM with goal of improving the quality of the product and the environmental performances.

During 2014-2017, such complex activity of quality and ecological management testifies to a high level of attention being turned to the problems of sustainability and correspondingly discloses the positive influence of QMS on the environmental performance of the company. These activities cumulatively demonstrate ENIEM's commitment to reducing its ecological footprint while striving to improve operational efficiency and safety.

We can also notice that most of ENIEM's goals were fully achieved during this period.

2.3 ENIEM's objectives set to be achieved during 2020:

Among the strategies that can a company uses to ensure and to improve its performance, efficiency, and profitability there is the strategy of domination by the cost, therefore, methods that can reduce costs include optimizing production methods or even implementing more efficient technology.

This has led ENIEM to establish a set of production quality objectives (Table N°02)⁷.

Table N°07: Action plan for achieving production quality objectives, fiscal year 2020.

| Objectives | Actions | resources | Deadlines | Manager |
|----------------------------------|---------------------------------------|-----------|------------|---------------|
| Execution of production programs | Monthly production follow-up meetings | - | 31/12/2020 | DGI |
| | Stabilize staff in specific positions | - | 31/12/2020 | Unit Director |
| | Improve Gap analysis to detect the | - | 31/12/2020 | Unit Director |

⁷ Internal company document, excerpt from the thesis of Mr. CHALALI Khemissi and Mr. DERMECHE Yogurta (La gestion de la qualité au sein d'une entreprise industrielle, Cas de l'ENIEM). Master's thesis in Economy and Entreprise Management at MOULOUD MAMMERY University of Tizi Ouzou. 2022/2023.page 109-110.

CHAPTER III: Sustainable development in a quality management approach at the ENIEM.

| | | | | |
|---------------------------|---|------------------|------------|----------------------------|
| | root causes of production shortfalls | | | |
| Reduction of waste | Increase the number of samples for special processes that generate waste. | Means unit | 31/12/2020 | Unit Director |
| | Training of operators for better control of production | Training Budget | 31/12/2020 | Unit Director |
| | Raise awareness among production staff about product handling | Training Budget | 31/12/2020 | Unit Director |
| Reduction of rework rates | Aquisition of pyrolysis oven for stripping the rods | Development plan | 31/12/2020 | Cold Unit Director |
| | Training for operators of special processes | Training budget | 31/12/2020 | Cold/Cooking Unit Director |
| | Awareness training for production staff on product handling | Training Budget | 31/12/2020 | Unit Director |
| Reduction of repair rates | Awareness training for staff | Training Budget | 31/12/2020 | Unit Director |
| | Relocation of the charging station to the end of emptying process | Unit resources | 31/12/2020 | Cooling unit director |
| | Acquisition of new wire strippers | Development plan | 31/12/2020 | Cooling unit director |

Source: 2022-2023 Thesis

ENIEM was implementing targeted actions to improve production quality while aiming to reduce costs and waste. The combination of training, equipment upgrades and better process management is designed to optimize efficiency and profitability.

The expected outcomes expected the achieving of the objectives mentioned in the previous table, but the following table⁸ shows the results of the quality production during 2020.

Table N°08: The production results of year 2020.

| N° | Indicators | Calculation frequency | Date of last update | Objectives | Result | Change (June 20/June 19) |
|-------|--|-----------------------|---------------------|--------------------------------|---|--------------------------------------|
| IND01 | Achievement rate (in value and products) | Monthly | 30/10/2019 | Production program achievement | Cool: -30,5% (Qty) -25% (val) Cooking -21,7 (Qty) - (22,9(val)) Air conditioning: -22,3(Qty) -15,5(val) Company-wide: -25%(Qty) -20,3% (val) | -45,1% -51,1% -24,3% -35,5% |
| IND02 | Waste rate | Monthly | 30/10/2019 | Reduction of rate waste | Cool: 0,35% Cooking: 0,37% Air conditioning: 00% Company-wide: | 103% 47% 0% |

⁸ Internal company document, excerpt from the thesis of Mr. CHALALI Khemissi and Mr. DERMECHE Yogurta (La gestion de la qualité au sein d'une entreprise industrielle, Cas de l'ENIEM). Master's thesis in Economy and Entreprise Management at MOULOUD MAMMERI University of Tizi Ouzou. 2022/2023.page 110.

| | | | | | | |
|-------|-------------|---------|------------|--------------------------|--|-----------------------------|
| | | | | | 0,23% | 92% |
| IND03 | Rework rate | Monthly | 30/10/2019 | Reduction of rework rate | Cool: Cooking: 0,7% Air conditioning: Company-wide: 0,09% | 175% 225% |
| IND03 | Repair rate | Monthly | 31/10/2019 | Reduction of repair rate | Cool: 11,7% Cooking: 35,3% Air conditioning: 0,8% Company-wide: 10,4% | 122% 261% 73% 168% |

Source: 2022-2023 Thesis

Overall, we find out that ENIEM during 2020 has not achieved its objectives that were supposed to be realized by the year:

- We notice that the production achievement rate has not been achieved and that because of the financial limitation that ENIEM has experienced in that period and also the COVID-19 pandemic that began in March 2020 that led somewhat the company to reduce work.
- For waste rate reduction, we find that the rates are all decreased which means that the objective is achieved (especially air conditioning unit with 00% of waste rate) except for cool unit that we can see that the rate has been increased compared with the last year's data (103%)
- The rework data showed no information for cooling and air conditioning units, but the cooking and company-wide their rework rate had been increased compared with last year data.
- The repair rate has been increased in all the units except the air conditioning unit had been increased compared with the last year's data.

After this analysis we note that ENIEM in 2020 encountered significant challenges that hindered its ability to achieve production quality objectives. Despite some progress in waste rate reduction, the company fell short of its production goals due to financial constraints and the operational disruptions caused by the COVID-19 pandemic, which led to a partial suspension of activities.

2.4 Comparative analysis between the period of 2014-2017 and 2020 period:

To determine the impact of Quality Management System on ENIEM’s sustainability, we will compare the results of 2014-2017 data and 2020 data so we can know the impact of QMS and to know if it’s way enough for ENIEM to rely on it to achieve its set goals

Table N°09: Impact of QMS on sustainability

| Impact of QMS on Sustainability | |
|---|---|
| 2014-2017 | 2020 |
| QMS had a substantial positive impact on ENIEM’s sustainability during this period. The initiatives and systematic management approach let to notable improvements in both product quality and environmental performance. The success is achieving most of the set goals underscores the effectiveness of QMS in driving sustainable practices. | The impact of QMS in 2020 was constrained by external factors such as the pandemic and financial difficulties. Although QMS principles helped in making progress in waste reduction, the overall impact on sustainability was limited due to the disruptions. |

Source: Established by us referring to the previous data

Table N°10: Conclusion about QMS and Sustainability.

| Conclusion about QMS and Sustainability | |
|---|--|
| Overall effectiveness | Challenges and limitation |
| QMS has demonstrated a strong positive impact on ENIEM’s sustainability during stable periods, such as 2014-2017. The system’s structured approach to quality and environmental management has proven | In times of crisis, such as the Covid-19 pandemic, external factors can significantly impact the ability of QMS to fully realize its potential. However, even under challenging conditions, QMS principles can still |

| | |
|---|---|
| effective in enhancing operational efficiency and reducing ecological footprints. | contribute to incremental improvements, as seen in waste reduction efforts. |
|---|---|

Source: Established by us referring to the previous data

In summary, QMS does have a positive impact on ENIEM's sustainability, particularly during periods of stability. The system's ability to drive improvements in environmental performance and operational efficiency is evident. However, its effectiveness can be influenced by external challenges, demonstrating that while QMS provides a robust framework for sustainability, its full potential may be constrained by unforeseen circumstances.

Section 04: Challenges of sustainable development in a comprehensive quality approach within ENIEM.

ENIEM has been plagued by sharp financial crisis, lack of raw materials, and large indebtedness. None of these was dealt with through government assurances and strategy proposals put forth based on performance in previous instances. The ongoing strikes and the financial turbulence testify to immediate actions and far-reaching solutions that will stabilize the company and restore production.⁹

A financial allocation of 3,5 billion dinars has been approved for ENIEM to revive its operations. The funding is part of a recovery plan intended to combat the prolonged halts in production, as well as its structural and financial difficulties and also a portion of these funds appears to have been absorbed by salaries. ENIEM's solid environmental foundation has resulted in past interventions that did not yield results, including high debt levels, repeated strikes, and operational interruptions. The new financial allocation should allow production to be restarted, especially with air conditioners, and support expansion into other products through 2025. In this sense, the Minister of Industry emphasizes the objective of clear goals and the need to serve these financial interests to ensure ENIEM industry is regained.¹⁰

ENIEM was shut down as of March 22nd 2020 due to COVID-19 outbreak. It reported large losses: production losses of 600 million dinars and lost revenue of 700 million dinars. That halt in activities has also been caused by postponement from the total lockdown, which impeded transportation and custom activities all together. In assessing the resumption of operations further, General Director Djillali Mouazer stated there is a hold up on the clearance of the raw materials that are essential to the resumption of operations. In this crisis, several measures were implemented including all employees were sent on mandatory leave; employees used leave entitlements (annual, anticipated and leave without remuneration), with arrangements for the possibility of salary advances to be repaid as well in due course.¹¹

After the data analysis we did in the previous section, and the data we got through several articles, we can establish a SWOT analysis of ENIEM to identify the company's

⁹ <https://elwatan-dz.com/tizi-ouzou-les-travailleurs-de-leniem-en-greve> by [Hafid Azzouzi](#) Published on February 14th, 2024. Consulted on September 1st at 23:26

¹⁰ <https://elwatan-dz.com/industrie-de-lelectromenager-tebboune-sauve-leniem-de-tizi-ouzou> by [Hafid Azzouzi](#) Published on May 14th, 2024. Consulted on September 02nd at 00:00.

¹¹ <https://observalgerie.com/2020/04/17/economie/coronavirus-en-algerie-leniem-fait-face-a-de-lourdes-pertes/> by Rédaction, published on April 17th, 2020. Consulted on September 02nd at 00:22.

strengths, weaknesses, opportunities, and threats, and that we help us to know if really ENIEM has achieved a sustainable development.

TableN°11: SWOT analysis of ENIEM.

| SWOT analysis of ENIEM | |
|---|--|
| INTERNAL | |
| STRENGTHS | WEAKNESSES |
| <p>Reputation for product quality: ENIEM is recognized for the quality of its products. This positive reputation is a major asset that can contribute to the effective implementation of a QMS and customer retention.</p> <p>Governmental financial support: ENIEM benefits from 3,5-billion-dinar allocation for its recovery, indicating significant state support to overcome its financial difficulties.</p> | <p>Liquidity and production issues: ENIEM faced financial challenges with high debt and delayed salary payments. The lack of raw materials and financing issues for purchasing these inputs affect production.</p> <p>Activity instability: The company has experienced prolonged production interruptions due to the health crisis, strikes, and customs issues. These interruptions affect the continuity and efficiency of operations.</p> <p>Resource management: Despite receiving subsidies, a portion of these funds appears to have been absorbed by salaries, without providing for long-term sustainable solutions for the company.</p> <p>Instable social sustainability: repeated strikes, late payment of salaries.</p> |

| EXTERNAL | |
|--|--|
| OPPORTUNITIES | THREATS |
| <p>Export and expansions plans: The company plans to export its products to Sahel countries and expands its sales network through the opening of new outlets. This shows a growth ambition and a strategy to diversify its markets.</p> <p>Innovation and modernization: ENIEM has the chance to modernize its processes and products to meet current market needs to integrate more effective and innovative quality practices, focusing on high quality and energy-efficient products.</p> | <p>Economic context and health crisis: The COVID-19 pandemic and lockdown restrictions continue to negatively impact production and revenue. Customs issues and production stoppages increase financial losses.</p> |

Source: analyze of the previous the previous given data

ENIEM possesses several strengths, including substantial financial support and ambitious expansions and export plans, coupled with a strong reputation for quality. However, it faces significant weaknesses such as liquidity problems, frequent production interruptions, and ineffective financial management. The company has notable opportunities for growth through financial recovery and commercial expansion, with innovation offering potential to bolster its market position. Nevertheless, it contends with serious threats from the health crisis, internal conflicts, and ongoing financial management issues, all of which challenge its stability and future success.

CONCLUSION:

To conclude, ENIEM has not achieved yet sustainability in any of its key aspects. Economically, ENIEM faces ongoing financial difficulties and poor fund management, which threaten its future economic viability. Environmentally, ENIEM's reputation for product quality might imply some kind of sustainability because of the quality management system's principles, but that is not enough to achieve the set goals because of some external factors such as CORONA VIRUS. Socially, ENIEM has had to deal with repeated strikes, late payment of salaries, and internal social tensions, indicating a rather serious inability to manage social sustainability effectively. Therefore, despite the fact that there are ongoing improvements and some financial aid, ENIEM is not there yet in full terms of sustainability. To obtain complete levels of sustainability, it is critical that the company improves financial management, working conditions, and employee pay, as well as enhance its environmental practices.

OVERALL CONCLUSION:

The first chapter covered the basic elements of quality management and clarified some foundational terms pertinent to our research. In summary, aspiring organizations need quality management to achieve success and maintain competitiveness. Specifically, quality management encompasses the principles, processes and practices that are in place to, [or, dilate to,] assure and improve quality of products and services. Quality must be defined based on the value it adds for customers or the organizations stakeholders, demanding a focus to its customers, and involvement of all levels of the organization. In relation to this, effective quality management must result in operating excellence and facilitate one organization's ability to be successful in an environment of customer satisfaction and the improvement that is expected.

The second chapter, linking quality management to sustainable development provides an overall umbrella for conducting business. This alliance reinforces efficiency by minimizing waste and fostering responsible behavior-such as measures of operational excellence and sustainable resiliency-and will be of help to organizations, society, and the environment at large.

The movement to incorporate environmental and social measures alongside the current financial measures is a management trend that reflects the importance of "systems thinking" in quality management, system thinking with the goal of continuous improvement. Progressive organizations will synthesize the quality management system to advance sustainability. Quality management systems can optimize processes, sustain performance improvements, and create a shared vision of business operations. This approach encourages organizations to deliberately interconnect their sustainability metrics with their quality objectives and, in so doing, embed sustainability in everyday business operations, allowing growth and a pathway to a more sustainable future.

In the third chapter, we realized that ENIEM is still not at the position to be fully sustainable on all of the most essentials. Economically, it still faces long-standing financial difficulties and inappropriate management of funds that threaten to undermine its long-term sustainability. Environmentally, while the reputation of high-quality products from ENIEM may indicate some level of commitment toward sustainability, this is not sufficient to meet the expectations of sustainability, especially in view of such external factors as the coronavirus pandemic. From a social perspective, ENIEM has to deal with the impacts of continued strikes, delays in salary payments, and internal tensions-features that denote

OVERALL CONCLUSION

serious shortcomings in the management of social sustainability.

To be fully sustainable, there are several areas on which ENIEM needs to work. Economically, it has to manage the funds in a better manner. Socially, it needs to establish better conditions at work and pay salaries in time. Furthermore, it has to improve its practices environmentally so that they can at least start living up to the expectations of sustainability. While the improvements continue and with just a trifle of financial support, these will be areas that will make ENIEM truly sustainable.

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Abstract

This master's thesis explores the relationship between Quality Management System (QMS) and Sustainable Development within the context of ENIEM, a key player in the Algerian home appliance industry. The study aims to determine the impact of implementing a QMS on ENIEM's sustainable development. It examines the theoretical framework of quality management, the links between quality management and sustainable development, and the specific application of these principles at ENIEM. The research methodology includes a comparative analysis of QMS achievements during two periods (2014-2017 and 2020), considering significant events like the COVID-A9 pandemic. The findings highlight the challenges and successes in integrating sustainable development within a comprehensive quality management approach at ENIEM.