The Japanese Method 'kaizen' and its role in establishing the standard for quality management system ISO 9001/2015

الطريقة اليابانية kaizen ودورها في إرساء المواصفة القياسية لنظام إدارة الجودة ISO 9001/2015

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الملخص:

إن الهدف الرئيسي لهذه الدراسة التعرف على مدى تأثير إستراتجيات الطريقة اليابانية الكايزن Kaizen (إستراتجية التطهير، إستراتجية القضاء على الضياع أو الهدر، إستراتجية وضع قواعد العمل) في إنجاح وتحقيق المواصفة القياسية لنظام إدارة الجودة ISO 9001 :2015 في المجمع الصناعي قوميدي بمدينة البليدة، حيث تم الاعتماد على المنهج الوصفي التحليلي وذلك من خلال التطرق للمفاهيم الأساسية للدراسة، وبهدف إسقاط المفاهيم ميدانيا تم توزيع الاستبيان بطريقة العينة القصدية على 40 مفردة في المؤسسة محل الدراسة، ولاختبار الفرضيات تم الاستعانة بأدوات التحليل الإحصائي منها الارتباط والانحدار الخطي البسيط، ومن أهم النتائج المتوصل إليها وجود علاقة تأثير معنوي إيجابي بين متغيرات الدراسة، كما تم تفسير النتائج ومناقشتها وتقديم بعض الاقتراحات.

الكلمات المفاتيح: الكايزن، إستراتجية التطهير، إستراتجية القضاء على الهدر، إستراتجية وضع قواعد العمل،2015: ISO 9001.

تصنيف Jel: L15, M1, M11

Abstract:

*The main objective of this study is to identify the impact of the Japanese Kaizen method strategies (*housekeeping *strategy, waste elimination strategy, business rule-setting strategy) in the success and achievement of the Standard Quality Management System (ISO 9001:2015) In the Goumidi Industrial Complex in Blida, where the descriptive analytical approach was relied upon by addressing the basic concepts of the study, and in order to project concepts in the field, the questionnaire was distributed in a sample method intended to 40 individuals in the institution in question, and to test hypotheses was used using analytical tools Statistics include correlation and simple linear regression, one of the most important findings is the existence of a positive moral impact relationship between the variables of the study, as the results were interpreted and discussed and some suggestions were made.*

Key words: kaizen, Housekeeping strategy, waste elimination strategy, business rule-setting strategy, ISO 9001: 2015.

Jel Classification Codes : L15, M1, M11

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Introduction:

The technical explosion, economic competition and knowledge growth have led to a significant perception in industrial and administrative processes in all government and commercial sectors around the world. The fact that industrial companies have effective quality systems that is a competitive advantage that increases their market share in global markets. This led many industrial companies to focus their efforts towards an efficient quality management system, which is one of the modern management concepts that emerged as a result of the intensification of global competition between Japanese production organization on the one hand, and the American and European enterprises on the other.

With its quality of sales, Japan has been able to overwhelm the global markets and wins customer satisfaction around the world through the introduction of quality management. One of the most prominent ways to achieve this system is to rely on continuous improvement, which is the common theme of quality improvement initiatives around the world. In Japan.it is called "Kaizen", which is used in all spheres of life. It applies gradual change of continuous improvement using small steps, it requires patience and continuous follow-up to ensure success and change in the long term. Due to the increased intensity of international competition and the multiplicity of Specifications between countries, preventing the facilitation of trade exchange, ISO has issued a series of international standards that seek to protect the customer by maintaining acceptable policies and high levels of customer satisfaction.

The Interest on the part of business organizations in general and Goumidi Industrial Complex in particular towards the application of modern methods to improve the quality of products, including continuous improvement, which is a key factor in the sustainable development of the quality of the organizations performance, and a mechanism for building new knowledge through the development of creativity. The spirit of participation among employees, is a fundamental pillar of the quality management system in eliminating deviations in performance and applying the principle of zero defect. On the basis of the foregoing, the main question can be asked: **To what extent does the Japanese method affect achieving the standard for quality management system ISO 9001:2015 at Goumidi Industrial Complex?**

hypotheses of Study:

In light of the subject matter of the study and in response to the requirements for achieving its objectives, the researchers formulated the following main hypothesis:

There is a significant correlation relationship between the Japanese Kaizen method and the standard of quality management system ISO 9001 :2015.

Included under this main hypothesis there is a set of sub-hypotheses formulated as follows:

- There is a significant correlation between the business rule-setting strategy and the quality management system standard ISO 9001 :2015.
- There is a significant correlation between the waste elimination strategy and the quality management system standard ISO 9001 :2015.
- There is a significant correlation between the housekeeping strategy and the quality management system standard ISO 9001 :2015.

The importance of the study:

The importance of the study stems from the need for economic organizations to change traditional management methods, which are appropriate to cope with the rapid scientific and economic developments, and the necessary to move towards adopting modern administrative methods such as; continuous improvement. This approach aims to change for the better, Hopefully, it will help organizations to solve their problems and accept change as an approach to achieve the standard of quality management system ISO 9001 :2015, presenting high quality products, and develop enterprise performance.

Objectives of the study:

In light of identifying the central question and its importance, we seek to achieve the following objectives:

- Seek to develop the concept of continuous improvement and standard of the quality management system ISO 9001:2015.
- the actual reality of using continuous improvement by applying the most important continuous improvement strategies to establish the standard of quality management system ISO 9001:2015 at Goumidi Industrial complex.
- Test the hypotheses of the study in terms of the relationship of effect and correlation across its variables and the extent to which it can be applied to the enterprise of study.
- Make recommendations based on the results that help decision makers to adopt continuous improvement and ISO 9001, as an approach that helps the success of industrial organizations by improving the quality of the products presented.

Previous studies:

A set of previous studies related to the subject of our research can be presented below:

- The study of Donia Tareq Ahmed (**2018**), **"Accreditation of Continuous Improvement to Raise the Performance of Senior Managers in Iraqi Hotels"**, Analytical Study of Sample Reviews of Premium Class Hotels Managers, Journal of Administration and Economics, No. 115, Volume 14, The objective of the study is to identify and diagnose the basic dimensions to the requirements of continuous improvement and the basic dimensions of the performance of the hotel senior management, and explained the impact of the relationship between the dimensions of improvement and the performance of senior management in premium class hotels, where 89 questionnaires were distributed to managers in premium class hotels. The study reached an emphasis on Disseminating the concept of a culture of continuous improvement, and that research organizations have flexible organizational structures to keep pace with changes and adapt to their environment, and follow and periodically measure standards for continuous improvement.
- The study of Azhar Naama Abu Ghneim (**2016**), **"The role of continuous improvement in achieving the customer's perceived value-analytic study of the opinions of a sample of workers in technical institutes and colleges",** an article presented the Journal of the Faculty of Islamic, University of Kufa, No. 37, Volume 02, the study aimed to identify and diagnose The level of basic dimensions of continuous improvement requirements in the administrative process and the impact of the relationship between the dimensions of continuous improvement and those of achieving the perceived value of the customer, And devising the necessary indicators foe making decisions to develop the reality of the situation in line with the aspirations of the senior administrative leadership in the field of quality management. And achieving reliability, where the sample of the study reached 89 was mostly limited to

workers (substantive and administrative) in administrative units that are in contact with the student. The study has reached the emphasis on spreading a culture of continuous improvement and adopting the vision of the organization that requires creating an organizational climate that supports and recognizes the importance of continuous improvement to enhance the enforcement of success and the development of special programmes in operationalizing the improvement process at the level of the research organizations.

- The study of Kharaz Al Akhdar (**2018**), **"The development of creativity to serve continuous improvement, the case study of economic institutions in the west of Algeria"**, a doctoral thesis, the University of Tlemcen -Algeria-. The study aimed to identify the reality of creativity in Algerian institutions and its relationship to continuous improvement, and attempting to analyze The link between the independent variable with the dimensions of the creative process and the elements of creativity in the enterprise on the variable represented by continuous improvement, 180 forms were distributed to a sample of managers and heads of departments of the entreprises under study, represented in 14 economic entreprises active in the west of Algeria. The results of the study showed that there is an impact of the development of creativity on continuous improvement, and that creativity is not a coincidence but rather a combination of efforts and continuous formation of individuals, which creates the appropriate environment for continuous improvement in the Algerian economic institution.
- The study of Faiha Abdullah Yaaqub (**2018**), **"The effect of continuous improvement in achieving the competitive advantage of Iraqi universities and their research projects"**, an article presented in the Journal of Accounting and Finance Studies, Iraq, No. 44, Volume13, University of Technology of Iraq. This study aimed to analyze the situation of the University of Technology in Iraq, proposing an ongoing strategy to transform research projects into industrial products that meet market requirements and contribute to supporting the national economy, by presenting the set of challenges and the problems facing the university and the wherewithal for the success of the educational system and achieve a competitive advantage for the university and its research products. The study concluded that the Iraqi University of Technology works to pay attention to the academic life of faculty members and students in pursuit of the goal that resulted in increasing efficiency and effectiveness in the process of creativity and innovation.
- Johanna Madrigal Sanchez (**2012**) study, entitled **"Assessing Sustainability of the Continuous improvement Through The identification of Enabling and inhibiting Factor"**. A PhD thesis, The study aimed to identify the factors needed to maintain continuous improvement, assessing the impact of time, region and type of industry on the factors affecting the sustainability of continuous improvement, 103 questionnaire forms were distributed and analyzed to business managers, the results found that time has no impact continuous improvement , and this can have a negative impact on efforts to maintain it, and companies in the medical devices and healthcare sector are bound to strict standards that define and systematically disseminate improvement strategies.
- The study of Talens Thalner (**2005**), entitled **"The Application of Continuous Improvement in Higher Education"**, aimed at determining the degree of use of continuous improvement in Finance, Facilities Management, Additional Services Section, and Enterprise Training Section at University of West Michigan, the researcher used the survey method. The sample of the study reached 147 managers. The study found that most continuous improvement methods are used permanently, but the continuous improvement method and reference comparison are the most commonly used, the justification for continuous improvement paid attention to the

following sections: Improve services, faster response, increase financial returns, and improve communication across the department and educational institution as a whole.

- The study of Kefalia and Kohag Qefalia & Koxgaj (**2011**), entitled **"The use of Continuous Improvement in Economic entreprises of the Albanian Government"**, this study aimed at finding out how the state economic institutions in Albania can apply Concepts and processes of continuous improvement of quality and the extent of use of means of improvement in economic entrprises across each one. The study also aimed to identify the reasons that led these entreprises to adopt the process of continuous improvement, the obstacles they faced in this process, the results that arose from this process. This study was applied to 141 workers in state economic entreprises in Albania, the study found that the most frequently used continuous improvement teams, and that improving the quality of products and increasing the effectiveness and efficiency of economic etreprises are the most important motives for continuous improvement, and the most prominent obstacles are the lack of availability of Financial disciplines required.

I- The theoretical framework of Kaizen (Continuous Improvement):

Kaizen is a method that exists in the Japanese society, it is used in everything that helps to improve productivity and mastery work in life at the individual, family and community levels. Its concept was spread more in 1984 by the Japanese expert **"Maskai Imai"**, who showed how Japan used the Kaizen concept to improve Its competitiveness and economic position, he demonstrated also how it is used in the Japanese factories, the beginning was from the company Toyota, The idea of identifying eliminating waste in processes is the two main axes of the improvement industry through Kaizen..

I-1- Definition of Kaizen:

Kaizen means change for better, this word is divided into two parts Kai means "non" or "change" and Zen Means "the best" (**Comtois & Poder, 2013, p. 177**). Kaizen technologies are mainly implemented in Gamba, a Japanese word for actual work location or in other words where they occur. Processes that give additional value and generally translates Kaizen Gamba into continuous improvement in work sites or processes (**Thessaloniki, 2020, p. 12**). Given the importance of this concept, researchers in this field have strived to give a broad and comprehensive concept of continuous improvement. The following is a brief presentation of these opinions:

"It's a principle that the organization must continue to pursue", says Philip B. Crosby for continuous improvement of quality as beneficial to the organization. The cost of standard quality is much more than the one of continuous improvement that saves huge funds. (Ni & Sun) defines it as "the method of step by step to follow the excellent achievement by measuring performance in a systematic way that excludes any method of waste and lack of conformity and work in cooperation with the processors" (**Goetsch & Stanley, 2020, p. 77**). Continuous Improvement according to ISO 8402 is defined as a continuous search for ways that improve processes. These include comparing distinct applications, developing a sense and awareness among individuals of ownership of the activities. And operations **(Lee & Larry , 2002, p. 89**). It is defined as a way of life that all activities can be subject to such as cost, skill scheduling, work relationships, which enhance the quality of the organization (**Evans, 2008, p. 25**).

From the foregoing, the researcher's procedural definition of continuous improvement can be formulated as continuous efforts to improve processes, services or products, these efforts can seek to achieve "cumulative" improvement over time or "abrupt" improvement once.

I-2 Kaizen strategies:

Continuous improvement requires a commitment to progressively make changes for the better and continuously. The primary objective of these strategies is to focus on in-site activities (Gamba) which leads to the production of a good or the provision of services of high quality at the lowest possible cost. by working to implement simple and effective operating rules, there are three basic strategies that can be summarized as follows (**الموسوي، 2019، صفحة 35**)

I-2.1 Housekeeping strategy:

means practicing the best way to do the work, ; it is a strategy that requires getting down to the work site and identifying problems and their causes accurately and treating them **(Blocher , Chem , & lin, 2002, p. 160**). therefore, there are five housekeeping steps **(Skaggs, 2003, p. 03**):

- **Sorting / in Japanese "Seiri":** This first element focuses on the event of unnecessary activities by means of a process called Red Card where on the day of the members of the housekeeping team marked a red color on disabled tools and machines to be excluded from the work site, representing the starting point for diagnosing light problems and providing accountability at the event site. Excluding traditional means in industry and using modern means.

- Set in Order / in Japanese "Seitom": means the importance of arranging or organizing the necessary and important things in the right and proper places, focuses on the efficiency and effectiveness of production processes by following an appropriate strategy that includes the process of organizing and managing the work, one of the benefits of reducing the time lost in searching for things.

- Shining / in Japanese "Seiso": Indicates the importance of continuous polishing and cleaning of the working environment, its benefits include avoiding machine malfunction and maintaining their readiness and accuracy.

- Standardise / in Japanese "Seiketsu": Means the need to develop specific performance rules and standards that can be referenced to identify errors and deviations, these standards and rules should participate in which all workers to determine what should be the case in the workplace.

- Sustain / in Japanese "Shitsuke": means the development of systems to ensure the continuity of the whole process "Kaizen" means continuous improvement This element is considered one of the most important and difficult elements because it is linked to the training of the workforce to achieve the previous elements, and when it comes to continuation is considered both organization, liquidation and evaluation. Cleaning is periodic activities that do not stop, but continue indefinitely. Its benefits include maintaining the ability to work efficiently, raising the level of skills and maintaining quality (**Masaaki, 2008, p. 39**).

I-2.2 strategy of waste elimination / "Muda" in Japanese:

Useless work in Japan is called Muda Materials, an unhelpful work is the one that does not give any additional value to work, organization and customer, so any work, activity or process = useful work + Muda, so Kaizen is interested in canceling, attacking or minimizing any Waste (Muda) in Jamba (work site, process or problem) **(Titu , Oprean , & Grecu , 2010, p. 01**). Every work carried out can be improved, and every operation currently carried out must contain: waste. So, reducing or eliminating this waste provides added value to the operation. Thus, it benefits the organization (**محسن ، 2017، صفحة 45**), The customer will also

benefit from its outputs. The elimination of waste in operations is the main axis of change through Kaizen, and the process of wasting or dumping begins at sites and processes with the visible impact of Significant with a focus on strategically most important areas, which achieve rapid results and that maintain their continuity Sustainable (**Masaaki, 1997, p. 32**)

I-2.3 Business rules-setting strategy:

Business rules are called the set of practical actions taken with the aim of producing or providing customer service. The word Rules here means that this set of actions is the best way to achieve that goal. Effective business rules are distinguished by the following characteristics. (**Dhongade , Singh , & Shrouty , 2013, p. 120**)**:**

- It is the best and easiest way to get the job done, it leads to increase the experience of employees and making them acquire the necessary skills;
- Clarify the realistic course of operations: rules usually build on previous experiences in performing and exercising the same tasks. If you recognize the itinerary (or flow) of processes, you can determine the cause and location of the default by simply studying the product or service in its final form;
- Provide clear benchmarks for performance measurement, without that you will not be able to determine whether a failure in an employee is in the same style of performance;
- Provides a basis for review and evaluation, meaning that it explains to the manager whether the work is done properly, whether an individual is doing his job with the desired sincerity and quality;
- Provides means to prevent recurrence of error and overcome choking points When all this is done within a continuous improvement method, it means constantly evolving and adapting these rules to become more effective and simple than they are, so that we continue to evolve until you get rid of any waste of time, effort or resources, and you get the highest possible quality.

II- The concept of standard quality management system ISO 9001 /2015:

The adoption of a quality management system should be a strategic decision for the organization to help it improve its overall performance, which ensures the organization's survival, continuity and steadfastness in an atmosphere of competition in the market and ensures its continuity, and in an integral part. The quality management system helps in coordination and guidance processes. The activities of organizations and commercial companies to meet customer requirements and improve efficiency and effectiveness on an ongoing basis.

II-1- Definition of standard quality management system ISO 9001 /2015:

It replace the previous version ISO 9001:2008, which was amended to clarify some points and to enhance compliance with environmental quality regulations and added occupational health and safety system OSHS 18001, defined as a written document containing an accurate description of the material or product whether preliminary, intermediary or final, in order to be usable (**زعبل، 2015، صفحة 09**)

In another context, it is defined "as the mechanism by which the facility can organize its operations and manage its supplier to achieve quality and improve economically in all its activities" (**Chen, Anchecta, Lee, & Dahlgaard, 2016, p. 65**), it is considered the most comprehensive document in the ISO series. All of them are applied to all organizations where they contain criteria for conducting activities designed and coordinated to guide and control the organization's management in terms of quality. This specification uses the Deming wheel (Plans - Execute- Check - Make Decision) that enables organizations to ensure that their

operations have sufficient resources and are well managed and enforce improvement that have been identified and implemented **(Abdoulaye , Gadiaga, David , & Maxime , 2019, p. 25**).

The European international standard ISO 9001:2015 affiliated to the International Organization for Standardizations is the most prominent approach that defines the requirements of a quality management system while using the ISO 9001 specification is via a set of documents that include details of a management system quality (**Pedro & Domingues, 2017, p. 150**). In fact, ISO 9001 documents are only a description of the system and cannot be used as a management system document. The quality management system serves many purposes within business organizations including the following **(Roland , Christoffer , & Richard , 2016, p. 31**):

- Improving processes and reducing waste;
- Reducing costs, identifying and facilitating training opportunities;
- Development and involvement of staff;
- Identify trends in entreprises and companies, customer satisfaction through continuous improvement.

Improvement is one of the key elements of ISO 9001 quality management system, and according to the latest version of the quality management system in 2015, the improvement of the quality management system consists of 3 main sections: non-conformity, corrective actions and significant improvement (**الشرافي، 2020، صفحة 68**).

Includes a quality assurance model in design, development, production, inspection, testing, installation, and service including all elements. This specification is used by internal and external parties.

II-2- The benefits of applying the standard for the quality management system: ISO 9001/2015:

The expected benefits of applying a quality management system based on this global standard by the organization itself, the beneficiaries of its products or services, and those working in it are (**حافظ، 2017، صفحة 107**) :

- Production and service enterprises that receive ISO certification gain a competitive advantage that distinguishes them over others, and helps them entering new markets;
- Reduce costs by reducing damaged rates and re-work, using materials conforming to specifications, and raising the level of staff performance based on continuous and intensive training on quality impact activities;
- Provide and develop a complete set of documents that serve as a guide for administrative and technical procedures and data contributing to a better performance of all operations;
- Improve customer relationship and increase their loyalty to the entreprise, and provide assurance to customers that the enterprise follows positive steps to improve quality;
- Ensure the quality and efficiency of the performance of activities and processes related to the quality of products and services through the establishment of a specific preventive management system to prevent non-conformity with customer requirements(**حداد، 2020**)
- Expanding market share and increasing operations activities by building a quality management system that operates according to an international standard.

II-3- The most important major changes in terminology between ISO 9001 :2008 and ISO9001/2015.

The terms of the standard and some terms used in this international standard have been changed compared to ISO 2008/9001 to improve compliance with the specifications of other management systems. Changes in terminology do not entail the need for changes in the organization's quality management system documents. If the new version of ISO 9001/2015 is distinguished from the ISO 9001 /2008 version by a number of points, the most importantly are (**Koubek, 2015, p. 159**):

- The prerequisites for the specification became seven requirements instead of five in ISO 9001: 2008;
- One of the general requirements that became optional after being mandatory is the creation of a manual for a quality management system and the appointment of a management representative;
- The adoption of a quality management system is a preventive case, rather than having an item on preventive measures as before. Table 01 shows the most important changes in terminology.

Table n°1: The most important changes in terminology.

ISO 9001 : 2008	ISO 9001 : 2015
Products	**PRODUCTS & SERICES**
Exclusions	IT IS USED INSTEAD OF IT; IT IS NOT IDENTICAL AND ALSO NOT SPECIFIED IN THE ITEM GIVEN FROM THE STANDARD
Documentation- Records	DOCUMENTED INFORMATION
Work Environment	ENVIRONMENT FOR THE OPERATION OF PROCESS
Purchased Product	EXTERNALLY PROVIDED PRODUCTS AND SERVIC

Source: Prepared by researchers based on the standard ISO 9001/ 2008 and ISO 9001/ 2015.

II-4- The Relationship between Continuous Improvement and Quality Management System ISO 9001/2015:

The relationship between the two variables mentioned stems from the fact that continuous improvement is the essential element of applying the standard of quality management system ISO 9001:2015 , therefore, the method of continuous improvement is considered the system which consists of a set of methods and means that enable the facility of providing a service or product that meets the explicit and implicit requirements of customers, such as ; good design and raw materials which meet the specifications declared longevity and safety from defects in all its forms, it represents the fundamental pillar in eliminating deviations in performance and applying the principle of full participation of employees in achieving The zero defect searching for solutions to quality problems, the standard of quality management system ISO 9001 /2015 focuses on the importance of continuous improvement on the basis that the work is only the result of a series of related and successive activities that ultimately lead to the provision of a full product. ISO 9001: 2015 sets out the requirements for obtaining a certificate proving the ability of the institution to provide products that meet the requirements of the customer or consumer to satisfy the needs of the customer. It includes all stages and processes related to the quality of the product and the way to control it.

III- Method and Tools:

III-1- Population and sample study:

Our study community is represented by the National Food Corporation specializing in the packaging, processing and marketing of dairy products and its derivatives known as the Gomidi complex "Industrial Goumidi-Spa" branded **OKid's**. The geographical location is

represented in the industrial area. Location 2 No.38 Oulad Yaaich Blida -Algeria-, as one of the entreprises interested in quality in its products, the Goumidi Industrial Complex (G.I.G) has developed a program aimed at ensuring continuous improvement of quality. This program is a set of activities and plans in carrying out registration and implementation of the standard of quality management system ISO 9001: 2015, this study was conducted in the period from 09 December 2019 until June 2020, during which the questionnaires were distributed. The distribution process included some interviews with the officials of the research institution in order to explain some questions.

The sample of the deliberate stratified research made up of a group of employees, director of the organization, Assistant Director and technicians, executives from the senior management of the enterprise, marketing management, production management, human resources management, financial management. Standard quality management system ISO 9001: 2015, by supervising the quality control of the product and its conformity with the approved specifications and coordinating with various other departments to conduct periodic reviews regarding quality and the matters related to continuous improvement. 48 questionnaires were distributed to managers in the various units of the entreprise under study 40 were retrieved, while 8 out of 48 questionnaires distributed were not retrieved.

In addition to the preamble, which is at the forefront of the questionnaire form, whose questions were prepared on the basis of (05 experts) in order to obtain the data and information required to complete this aspect of the research. The questions have been prepared according to the Likert Scale, which is one of the most appropriate measures. They were used in the social and administrative sciences, It is easy to set up, interpret and easy to use, it is based on giving the sample vocabulary a set of phrases and asking them to express the degree of their consent or dissent to a graded scale from (01) expresses "**Strongly disagree**, to (05) which is considered "**Strongly agree**", and so on for each of the given expression.

III-2- The Validity of the measuring tool: In order to ensure the stability of the study instrument and the possibility of obtaining the same results on the sample itself, researchers used the Alpha Cronbach coefficient for each axis of study, the value of the Alpha Cronbach coefficient for the independent axis (Kaizen Japanese method) 0.934, the value of the "Alpha Cronbach" coefficient of the dependent axis (ISO9001 /2015 standard) was 0.762, while the overall stability rate was 0.932. The questionnaire has a good and acceptable degree of stability that reassure researchers to apply on the core study sample. The results are as represented in the following table.

Table n° 2: Represents the Alpha Cronbach method of the questionnaire.

VARIABLES OF QUESTIONNAIRE	NUMBER OF ITEMS	ALPHA CRONBACH PERCENT COEFFICIENT
Japanese method (Kaizen)	**15**	**0,934**
Standard Quality for Management System ISO9001 /2015	**11**	**0,762**
Total Questionnaire	**26**	**0,932**

Source: prepared by researchers based on the outputs of SPSS 25.

From Table 2, the Alpha Cronbach factor for the Japanese method kaizen "independent variable" was **0.934**, while the Standard Quality for Management System ISO 9001: 2015 variable was **0.762**, and the total stability factor was **0.932**, a very high level.

III-3- Validity of the questionnaire: Researchers have used the following methods:

III-3.1 Validity of the experts:

The questionnaire was presented in its preliminary form to a group of 5 university professors from specialists, where they expressed their views and observations on the relevance and affiliation of the paragraphs of the questionnaire, as well as the clarity of their language versions. Bringing the number of paragraphs of the questionnaire to 26.

III-3.2 Subjective validity:

It is a method of validity and is calculated by the square root of stability the, results are shown in the following table.

Table n° 3: the subjective validity method of the questionnaire.

QUESTIONNAIRE VARIABLES	NUMBER OF EXPRESSIONS	ALPHA CRONBACH RELIABILITY COEFFICIENT	VALIDITY VALUE
Japanese method (Kaizen)	**15**	**0,934**	**0,966**
Standard Quality for Management System ISO9001: 2015	**11**	**0,762**	**0,872**
Total Questionnaire	**26**	**0,932**	**0,965**

Source: prepared by researchers based on the outputs of SPSS 25.

From the table, it is clear that the coefficient of reliability with the subjective validity method of the axes reached the value of validity (**0,934**) for the first axis of the Japanese method (Kaizen), while for the second axis it amounted to **0.934**. Standard quality management system ISO 9001:2015 the validity value for B to (**0,762**), while for the questionnaire as a whole the value of validity was (**0,932**) This indicates that the questionnaire is valid and well reassured the researchers to apply it to the basic study sample.

III-4- Normality distribution test:

To determine the normality distribution of the study variables being studied, researchers relied on the method of testing Kolmogorov-Smirnov, the results as shown in the following table.

Table n°4: the results of the test for the normality distribution of the answers data of individuals sample.

MEASURES OF THE STUDY	KOLMOGOROV-SMIRNOV			TEST RESULT
	Sig	Df	Statistic	
Japanese Style Variable (Kaizen)	**0.200***	**40**	**0,115**	**DATA FOLLOW THE NORMALITY DISTRIBUTION**

Standard Quality Management System Variable ISO9001: 2015	**0.200***		**0,187**	**DATA FOLLOW THE NORMALITY DISTRIBUTION**
IF THE PROBABILITY VALUE IS WRONG OR (SIG SPIRITS) IS BIGGER THAN 0.05, THE DATA FOLLOWS A NORMALITY DISTRIBUTION				

Source: prepared by researchers based on the outputs of SPSS 25.

From the table above, we notice that all the probability values or the significance level of the study variables **Sig = 0, 200*** are bigger than (**0.05**), and the **P. value = 20%** bigger than the significance level of **5%**, which indicates that the sample individuals' answers data follows the normality distribution, so that the instructional statistics should be used to answer the study's questions and hypotheses.

IV- Results Discussion:

IV- 1- The descriptive analysis of the characteristics of sample:

In order to identify the demographic characteristics of the members of the study sample, part I of the questionnaire dealt with some of the personal data of the sample members.

- **Gender**: The distribution of the sample members by gender was according to the following table:

Table n°5: Represents the distribution of sample members by gender.

GENDER	FREQUENCY	RATIO
Males	**27**	**67.5%**
Females	**13**	**%32.5**
Total	**40**	**%100**

Source: prepared by researchers based on the outputs of SPSS 25.

From table number (5), we notice that the value of males exceeds the value of females. The number of males is estimated at **27** individuals at **67.5%**. This is natural because working in industrial enterprises does not help females due to the difficulty of working also, it is far from the headquarters of the industrial complex and the center of the city. Females reached **13** individuals with a ratio of **32.5%** indicates that females also have a significant role in the functioning of the entreprise to ensure its stability and achieve its objectives.

- **Age:** The distribution of sample members by age was as follows:

Table n°6: Represents the distribution of sample members by age.

AGE	FREQUENCY	RATIO
From 20 to 30 years	**08**	**20%**
From 31 to 40 years	**10**	**25%**
From 41 to 50 years	**08**	**20%**
More than 51 years	**14**	**35%**
Total	**40**	**100%**

Source: prepared by researchers based on the outputs of SPSS25.

From the table above, we notice that the largest age group for the sample was in the age group (more than 51 years) with **14** individuals and an estimated **35%**. The reason that the higher age groups are more frequent than other groups is the availability of professional experience This is an opportunity for Goumidi Industrial complex to build a strong culture of continuous improvement among employees and provide all the standard of quality management system ISO 9001: 2015 through the development of their professional abilities and experience, followed by age group (31 to 40 years). The number of sample members in the age group (20 to 30 years) and (41 to 50 years) was **08** and **20%**. Therefore, the majority of the sample members are of the age group are (older than 51 years).

- **Educational level**: The distribution of study individuals according to scientific qualification was according to the following table:

Table n°7: represents the distribution of sample individuals by Educational level.

EDUCATIONAL LEVEL	FREQUENCY	RATIO
Secondary	**02**	**%05**
Baccalaureate	**09**	**%22,50**
University	**14**	**%35**
Postgraduate studies	**15**	**%37,50**
Total	**40**	**%100**

Source: prepared by researchers based on the outputs of SPSS 25.

We notice from the above table that the distribution of the sample members according to the educational level represented in the largest category of scientific qualification postgraduate studies with frequency of **15** percentage estimated at **37,50%** , then followed by the category of academic qualification university with a frequency of **14** and a percentage estimated at **35%** , while we note that the percentage of **22.50%** representing the category of scientific qualification baccalaureate number of **09**, and finally the category with secondary scientific qualification of **02** and a percentage estimated at **05%**, and therefore the majority of the sample members of the qualification category Scientific postgraduate studies.

- **Job and professional experience:** The Sample study included all levels of job and professional experience; the results are as shown in the following table:

Table n°8: represents the distribution of sample members by job and professional experience.

JOB			PROFESSIONAL EXPERIENCE		
Category	**Frequency**	**%**	**Category**	**Frequency**	**%**
Director of the Department	**06**	**%15**	**Less than 05 years**	**14**	**35%**
Head of Department	**10**	**%25**	**From 06 to 10 years**	**10**	**25%**
Rationing	**08**	**%20**	**More than 10 years**	**15**	**40%**
Worker	**16**	**%40**			
Total	**40**	**%100**	**Total**	**40**	**%100**

Source: prepared by researchers based on the outputs of SPSS 25.

From the table (8) it is shown that about **65%** of the students are employees and employees of the lower administration. This is due to the activity of the Goumidi Industrial Complex. This is important for the study, because the culture of continuous improvement is the results of a series of Behaviors, beliefs and values of employees as well as working as a team. Also, about **40%** of the study sample have more than 10 years of experience in the current job, which indicates stability in managerial positions.

IV- 1- Test the hypotheses of the study:

- **Test of the main hypothesis**: which states that: "The Japanese Kaizen method influences the achievement of the standard of quality management system ISO 9001 :2015 at the Goumidi Industrial Complex". To test and validate this hypothesis, researchers used the simple linear regression statistical method, the results as shown in the following table:

Table n°9: Results of the simple linear regression coefficient test for the effect of the Japanese Kaizen method in achieving the standard of quality management system ISO 9001: 2015.

VARIABLES	REGRESSION EQUATION		TEST "T"		TEST "F"		CORRELATION COEFFICIENT " R2 "	DETERMINATION COEFFICIENT "R2"
	Coefficient "B"	Standard error	Value T""	Significance Level	Value "F"	Significance Level		
JAPANESE METHOD KAIZEN	19,88	3,27	06, 08	0,000	47, 82	0,000	0,746	0,557
STANDARD QUALITY MANAGEMENT SYSTEM ISO9001 /2015	0,39	0,05	06, 91	0,000				

Source: prepared by researchers based on the outputs of SPSS 25.

From the table above, we see that the correlation coefficient between the two variables was (**0.74**), which is a positive correlation coefficient, while the determination coefficient was (**0.55**), means that the Japanese method Kaizen interprets **55%** of the variables in the dependent variable, while the rest of the ratio is **45%** of the effect is due to other factors, while the value of " F " test was (**47.82**) at the indication level (**0.00**), which is less than (**0.05**), suggesting that the general hypothesis which states that: "The Japanese Kaizen method influences the achievement of the standard of quality management system ISO 9001: 2015 at the Goumidi Industrial Complex".

- **Test of the first sub - hypothesis**: which states that: "There is a significant correlation between the strategy of developing business rules and the standard specification of the quality management system ISO 9001: 2015 Goumidi Industrial Complex". Using Pearson correlation coefficient to find out the relationship between the two study variables, and the results obtained are as shown in the following table:

Table n°10: shows the number and value of Pearson correlation coefficient and the level of significance between the two study variables.

VARIABLES	NUMBER	VALUE OF CORRELATION COEFFICIENT	SIGNIFICANCE LEVEL	RESOLUTION
BUSINESS RULES SETTING STRATEGY	**40**	**0,731**	**0,00**	**Function There's a relationship**
STANDARD QUALITY MANAGEMENT SYSTEM ISO 9001 :2015				

Source: prepared by researchers based on outputs of SPSS 25.

From the above table we note that the value of Pearson correlation coefficient calculated between the strategy of setting business rules and the standard of the QMS 2015: ISO 9001 in the Goumidi industrial complex , valued at (**0,731**) , at the significance level (**0,000**) , which is less than the significance level of **0.05**, which can be said: There is a correlation between the strategy of setting business rules and the standard quality management system ISO 9001: 2015 at the Goumidi Industrial complex researchers are **95%** sure of the results of the study with the possibility of falling into error is **5%** . So, the first partial hypothesis was realized.

- **Test of the second sub - hypothesis:** which states that: "There is a significant correlation between the housekeeping strategy and the standard of quality management system ISO 9001: 2015 in the Goumidi Industrial Complex". Using Pearson correlation coefficient to find out the relationship between the two study variables, and the results obtained are as shown in the following table:

Table n°11: shows the number and value of Pearson correlation coefficient and the level of significance between the two study variables.

VARIABLES	NUMBER	VALUE OF CORRELATION COEFFICIENT	SIGNIFICANCE LEVEL	RESOLUTION
HOUSEKEEPING STRATEGY	**40**	**0,772**	**0,00**	**Function There's a relationship**
STANDARD QUALITY MANAGEMENT SYSTEM ISO 9001: 2015				

Source: prepared by researchers based on SPSS outputs.

From the above table we note that the value of Pearson correlation coefficient calculated between the housekeeping strategy and the QMS 2015 standard specification: ISO

9001: 2015 in the Goumidi industrial complex , valued at (**0,772**) , at the significance level (**0,000**) , which is less than it of **0.05**, which can be said: "There is a relationship between the housekeeping strategy and the standard Quality Management System ISO 9001: 2015 in the Goumidi Industrial Complex", that is, researchers are 95% sure of the results of the study with a **5%** risk of error. Thus, the second partial hypothesis has been realized.

- **Test the third sub - hypothesis:** which states that: "There is a significant correlation between the waste elimination strategy and the standard quality management system ISO 9001: 2015 in the Goumidi Industrial Complex". Researchers use Pearson correlation coefficient to find out the relationship between the two study variables, and the results obtained as in the following table:

Table n°12: shows the number and value of the Pearson correlation coefficient and the level of significance between the two study variables.

VARIABLES	NUMBER	VALUE OF CORRELATION COEFFICIENT	SIGNIFICANCE LEVEL	RESOLUTION
WASTE ELIMINATION STRATEGY	40	0,538	0,00	Function There's a relationship
STANDARD QUALITY MANAGEMENT SYSTEM ISO 9001: 2015				

Source: prepared by researchers based on outputs of SPSS 25.

From the table above, we note that the value of Pearson correlation coefficient calculated between the waste elimination strategy and the standard of quality management system ISO 9001: 2015 in the Goumidi Industrial complex was estimated at (**0,538**). , at the significance level (**0,000**) , which is less than it of **0,05**, which can be said: There is a relationship between the waste elimination strategy and the standard quality management achievement system ISO 9001: 2015 at the u Industrial Complex , that is, researchers are **95%** sure of the results of the study with a **5%** risk of making a mistake. Thus, the third partial hypothesis has been realized.

Conclusion:

This study shows that the Japanese Kaizen method is of great importance in achieving the standard of quality management system ISO 9001: 2015, through its various strategies. The field study emphasized this importance through the impact of the housekeeping, the Business Rules setting and waste elimination strategies on the Standard Quality Management System ISO 9001: 2015 in the Goumidi Industrial Complex. This led to the following results and suggestions:

Results:

The results of the field study were as follows:

- The respondents were sufficiently aware of the importance of the subject of the study, which was shown by the overall rate of answers to the axes that were high.

- There is a positive relationship between the Japanese Kaizen method strategies and the standard quality management system ISO 9001: 2015, which is explained by the correlation coefficient "R", it was valued at **0.746**.
- There is a positive average impact on the Japanese method strategies and standard quality management system ISO 9001: 2015, which is explained by the determination coefficient " R2 " it was valued at **0.557**.
- The results of the study showed the focus of the Goumidi Industrial Complex on the strategy of business setting rules and the strategy of housekeeping from the site of the event, which is important for the entreprise to achieve the standard of quality management system ISO 9001: 2015. This is due to its recognition of the importance of these strategies in raising the level of quality of its products and the sustainability of its outstanding performance.
- The Japanese Kaizen method is an integrated administrative and philosophical approach to various entreprises. It is the result of strategic objectives through the active participation of all employees of the entreprise, ultimately to achieve customer satisfaction and aspirations.
- The standard of quality management system ISO 9001: 2015 is a key factor in the development and sustainability of enterprises, which is important in owning and improving the competitive advantage of various types of enterprises and their ability to face other others.

Suggestions:

After reviewing the most important findings, we refer to the following suggestions:

- Making the standard of quality management system ISO 9001: 2015 a strategic objective starting from senior management and ending at the last worker and working on broadcasting the Japanese method Kaizen to individuals by holding special courses.
- Productive enterprises should adopt the Japanese Kaizen method as an advanced management method instead of traditional once, to achieve competitive advantage under globalization.
- It is essential that production entreprises apply the Japanese Kaizen method from the site of the event because of its great importance in the success and improvement of the quality of their products, taking all necessary measures, and carrying out scientific practices to disseminate and spread the strategies of the Japanese method of Kaizen at various levels. Management through the preparation of training programs in whatever form and purposes.
- The need for the entreprise to identify the methods of developing a strategy waste elimination, as well as to identify the most important reasons behind the lack of interest and decrease them, and trying to address them too.
- Productive institutions should pay attention to the Japanese method to face the rapid challenges in the markets, open to international experiences in the field of standard quality management system ISO 9001 2015 in developed and Western countries, especially to benefit from its application.

Endnotes:

1- Abdoulaye , S., Gadiaga, A., David , H., & Maxime , K. D. (**2019**). Analyse de la perception de l'utilisabilité de l'approche 5S-Kaizen-ISO 9001 par le personnel en milieu hospitalier: cas du Centre hospitalier universitaire de Tingandogo. *African Journals Online, 42* (1).

2- Blocher , E. J., Chem , k. H., & lin, T. (**2002**). *cost management a strategic emphasis.* McGraw-Hill.

3- Chen, K. C., Anchecta, K., Lee, Y.-D., & Dahlgaard, J. J. (**2016**). A stepwise ISO Based TQM implementation approach using ISO 9001:2015. *Management and Production Engineering Review, 7*(4), 65-75.

4- Comtois , J., & Poder, T. G. (**2013**). L'approche Kaizen au Centre hospitalier universitaire de Sherbrooke (CHUS) : un avantage organisationnel significatif. *25*(2), 169-177.

5- Dhongade , P., Singh , M., & Shrouty , V. (**2013**). A RevIew: Literature Survey for the Implementation of Kaizan. *3*(1).

6- Evans, J. R. (**2008**). *Applied Praductiom & Operatiom Management.* West Pub.

7- Goetsch , D. L., & Stanley, D. (**2020**). *Quality Management for Organizational* (8 ed.). USA: Pearson. Retrieved from 3- Ni, Wenbin & Sun, Hongyi (2009), The relation ship among Organizational evolutiomary perspective Total Quality Management Vol 20,N0 10.

8- Koubek, A. (**2015**). *Praxisbuch ISO 9001:2015 – Die neuen Anforderungen verstehen und umsetzen.* München: Hanser Verlag.

9- Lee, K. J., & Larry , R. P. (**2002**). *Operation Management : Strategy anf Analyis.* Prentice Hall.

10- Masaaki, I. (**1997**). *Gemba Kaizen.* McGraw-Hill.

11- Masaaki, I. (**2008**). Kaizen, Metóda, jak zavést úspornější a flexibilnejší výrobu v podniku. Brno, Computer Press.

12- Pedro, L. F., & Domingues, D. P. (**2017**, October). ISO 9001:2015 edition- management, quality and value. *International Journal for Quality Research, 11*(1), 149-158.

13- Poder , T. G. (**2013**). L'approche Kaizen au Centre hospitalier universitaire de Sherbrooke (CHUS) : un avantage organisationnel significatif Jonathan Comtois, Yvon Paris, Sylvain Chaussé Dans Santé Publique. *25*(2), 177.

14- Roland , v. J., Christoffer , R., & Richard , K. (**2016**). *DIN EN ISO 9001:2015 – Vorbereitung und Stand der Umsetzung in deutschen Unternehmen.* Berlin.

15- Skaggs, T. (**2003**). *Essential in the Lean Manufacturing improve the work place.*

16- Thessaloniki, R. (**2020**). *Kaizen : Definition & Principles in brief, A Concept & tool for employés in envolement*. Consulté le 07 02, 2020, sur http://www.michailolidis.gr

17- Titu , M., Oprean , C., & Grecu , D. (**2010**). Thecique in the Activity of Post-Sale Services in the Knowledge- Based. *International Multi Conference of Engineers and Computer Sciences, 2013.*

18- بن حفيظ باعمر محسن . (**2017**). *منهجية كايزن اليابانية Kaizen* (الإصدار 1). الأردن.

19- حسين علي زعبل. (**2015**). *iso 9001: 2015 وأهميتها في التغيير نحو الأفضل، الموقع الالكتروني*. تاريخ الاسترداد 06, 2020 29، من https://gsomagazine.com/iso-9001: 2015

20- صهيب تيسير الشرافي. (**2020**). التحسين وفق (iso 9001 : 2015) ودوره في بناء المنظمة الذكية دراسة حالة شركات مجموعة الاتصالات الفلسطينية. *مجلة بحوث الإدارة والاقتصاد، 2*(3)، 63-77.

21- عبد الناصر حافظ. (**2017**). تطبيق متطلبات الجودة في وزارة العمل والشؤون الاجتماعية بإستخدام المواصفة الدولية Iso9001: 2015، دراسة حالة المركز العراقي الكوري . *مجلة العلوم الاقتصادية والإدارية، 23*(101)، 191-211.

22- واثق علي الموسوي. (**2019**). *إستراتجية الكايزن اليابانية (Kaizen) بين الإدارة والتطوير* (الإصدار 1). العراق.

23- وليد حداد. (**2020**). *إدارة الجودة بناء على المواصفة المقاييس العالمية ISO 9001: 2015* . تاريخ الاسترداد 27 06, 2020، من http://www.ena.gov.lb/Files/Samples/pdf