

Ishkawa Chart In Determining The Size Of The Gap In The Application Of ISO14001 Specification In The Mosul Municipality Directorate

Prof. Dr Alaa Haseb Abdul Hadi Aljalely¹, Omar Ghanem Taha Al- Jeraisy²

¹Mosul University College of Administration and Economics, alaa_haseb@uomosul.edu.iq

²Mosul University College of Administration and Economics, omer.20bap182@student.uomosul.edu.iq

Abstract

This research aims to determine the size of the gap using the Ishikawa diagram (cause and effect diagram) within the requirements of implementing the provisions of ISO14001 in the Mosul Municipality Directorate. The unit requires studying according to what this unit possesses of the international specification for the environmental management system, and this research has been used in our research: Cause and Effect Diagram, as tools that can be applied in research.

It was found from the study that there is this gap between the reality of the specification in this unit and its requirements, and by 63.1%, which is a clear indication of the lack of compatibility in that the administrative practices do not seem compatible and appropriate with the environmental management system and approved in accordance with international requirements, which means it is important to come up with results in our study that can be taken in the Mosul Municipality Directorate.

Keywords: ISO14001, Yeshko scheme

Introduction

The mechanisms of implementing the environmental management system represented by the international standard ISO14001 are based on a set of steps or arrangements that are carried out in a sequential manner, and these steps are verified according to standard tools that ensure the achievement of efficiency and effectiveness when starting to implement the system, and these measurement tools are called quality measurement tools that use these Tools according to certain variables and needs when implementing the environmental management system, which means that the environmental management system needs when applying these tools during certain stages and that these tools perform different functions according to the

nature of their use, so the Ishikawa diagram (cause and effect) will be used, which is one of the important quality tools The study used at the present time, and accordingly, this research came with an introduction and four sections, as the first topic represents the methodology of the research, while the second topic devoted the field aspect to the research, and the third topic devoted the practical side, and finally the fourth topic, which includes conclusions and suggestions.

The first topic

Research Methodology

First: the research problem

Ideas were generated about the extent of adopting the requirements of the Environmental Management System specification (ISO 14001: 2015) using some quality measurement tools in the Mosul Municipality Directorate and identifying the problems that lead to a low level of quality for the services provided. Environmental protection to be one of the ways to address this phenomenon and an effective entrance to preserve the natural environment from the dangers of polluting materials, and the consequent reduction of the negative effects resulting from the use of these materials from waste and emissions that harm the natural environment and human health alike.

Thus, the study problem can be expressed by raising the following questions:

- 1-What is the level of availability of the terms and requirements of the international standard (ISO 201514001: 2015) in the Mosul Municipality Directorate?
- 2-What are the most appropriate quality measurement tools in implementing the international standard (ISO 14001:2015) in the Mosul Municipality Directorate?
- 3-What is the size of the gap between the requirements for implementing the standard and the current administrative practices in the Mosul Municipality Directorate?

Second: the importance of research

The importance of this study comes from the growing interest in the environment, which needs sound management and greater care because of its repercussions at the local and international levels, given that environmental problems know no borders in this era that witnesses various environmental challenges from natural

disasters that threaten the future of future generations. This topic is an attempt to find solutions related to the environment at the level of service organizations. Compliance with the international standard ISO 14001:2015 and the provision of its requirements is a nucleus from which we can start to integrate in the endeavor to respect, protect and preserve the environment.

The importance of the study is embodied by showing the importance of using the requirements of the Environmental Management System specification (ISO14001:2015) by using some quality measurement tools to overcome the obstacles that surround it.

Third: the objective of the research

- 1-Diagnosing and determining the size of the gap in the application of the requirements of the environmental management system in accordance with the standard ISO 14001:2015, and knowing the resulting environmental problems.
- 2-Providing environmental data and information that contribute to improving the environmental reality by diagnosing the sources of defects in accordance with the provisions of the specification in order to increase interest in this aspect by the responsible authorities.
- 3-Measuring the availability of requirements to implement the specification (ISO14001:2015) in the Mosul

Municipality Directorate in Nineveh Governorate.

4-Reaching conclusions and suggestions that are likely to help in forming a better picture of the extent of the contribution of ISO 14001:2015 in diagnosing and identifying the risks of environmental aspects.

Fourth: The hypotheses of the study

H1: (there is no gap in the level of availability of ISO14001:2015 standards in the Mosul Municipality Directorate).

H2: (Some quality measurement tools cannot be used in the application of ISO14001:2015 in the Mosul Municipality Directorate).

The second topic

Theoretical framework

First: the concept of the international standard ISO 14001: 2015

The environmental management specification is one of the most important specifications in administrative business organizations, as ISO issued its third version for the year 2015, which includes the environmental dimension within the strategy of business organizations, in order to reduce the level of emissions and modify environmental behavior based on controlling the level of environmental performance (Gilberto Santosa, et.al ,2016,1213)

(Nazi et al., 2021, 86) indicates that the international standard ISO 14001:2015 is the most famous international specification

for an environmental management system. On the environment, ISO 14001:2015 belongs to the ISO1400 family of international standards for environmental systems management. ISO14001:2015 provides a framework for the organization to help it meet the expectations of customers on an ongoing basis as well as comply with regulatory and legal requirements.

ISO 14001:2015 is defined from the point of view of (Al-Obaidi, 2012, 128) as a set of specifications for how organizations work in eliminating pollution by developing a special system and database for monitoring environmental performance, with elements of effective environmental management systems, and can deal with administrative requirements The other organization seeks to assist organizations in achieving a balance between their environmental and economic objectives, as the European Standardization Committee agreed to accept the requirements of the standard to be added to it that meets the needs and requirements of the European standard.

Second: The importance of the international standard ISO14001:2015

The international specification ISO14001:2015 for organizations can achieve an importance that stands out in several aspects., (Grover,2017,9).

1-Building a proactive approach that the organization depends on and does not have a reaction.

2-Understand the needs and expectations of stakeholders and the need for increased recognition of identifying and monitoring external and internal issues that affect their environmental impact such as climate change and the context in which they operate.

Work to improve resource efficiency and reduce
3-waste.

4-Manage environmental compliance obligations and promote the trend towards more sustainable environmental performance.

Third: The objectives of the international standard ISO 14001: 2015

This specification aims to assist the organization in accomplishing and completing its operations in light of the objectives set for it, including compliance with laws and environmental risk management, although the application of the requirements of environmental management systems is not mandatory when dealing with environmental issues due to the voluntary adoption and implementation of this system. However, environmental laws and competitive pressures have played a large and influential role in the organizations' orientation towards that system. (Allan, 2014, 34).

The ISO14001:2015 standard aims to achieve efficiency and effectiveness at the level of environmental performance within organizations, as some writers and researchers agreed on the following objectives :(Allam, 2015, 54) (Lftah.A, 2016, 121)

1-Benefiting from clean technology that does not conflict with global environmental standards, and this can only be done by including the culture of preserving the environment in human resource development plans and policies.

2-Drawing and adopting development practices in industrial and agricultural organizations by forming work teams for monitoring, diagnosis and analysis, and then developing perceptions of solutions to existing environmental problems.

3-Assisting in opening the doors of export for the organization to the world markets

Reducing the costs of the production process through the efficient use of
4-resources

5-Recycling waste for production, in order to overcome the problem of production waste that is harmful to the environment.

Fourth: The advantages of the international standard ISO 14001: 2015

The international standard ISO14001:2015 aims to encourage and develop more effective and efficient environmental management in various organizations towards developing and improving the environment and providing useful means. Accordingly, ISO14001:2015 is characterized by the following: (Nicoletti, 2016, 16) (Sierra& Noia, 1996.97)

Improving environmental management
1-helps reduce waste.

It helps with high efficiency in reducing
2-unnecessary expenses and costs.

Maintaining market share through the
3-image of a green company.

4-Institutions' commitment to this
specification increases their ability to
expand and revitalize their business.

5-Comply with all legal requirements that
increase the chances of obtaining new
customers.

It increases the ability to adapt to changes
6-in work effectively and confidently

7-Attracting more green and
environmentally friendly investments.

Fifth: Quality Measuring Tools

Some call them quality tools or quality improvement tools, others call them statistical quality control tools, and they may be called problem-solving tools for others, and they are also called the seven quality tools, while Charles asserts that quality ring teams use seven tools in collecting, summarizing and analyzing quantitative data, and sometimes use tools Others such as brainstorming, affinity diagrams, interrogative input tools and other tools that help circle members generate ideas (Charles, 2012, 13)

And that there are seven agreed quality management tools that help improve quality processes and make operations continue to improve in a systematic manner, and most economic units use quality management tools to analyze and determine the amount of quantitative and qualitative data related to operations, and quality management tools have been defined as “they are techniques for identifying and analyzing quality problems.” Among these tools is the Ishikawa diagram (cause and effect

diagram), which will be addressed as follows (Horngren, 2012, 675) (Aichouni & Benchicou, 2, 2014)

(Cause and Effect Diagram)

It is also called the Ishikawa diagram after Kaoru Ishikawa who developed it, and it is also called the Fish-Bone diagram because the integrated shape of the diagram resembles the skeleton of a fish. Following flow charts or Pareto charts to diagnose the causes of quality problems. (Summers,2007,78)

The cause of the problem can be related to the workforce or the development of human resources, or related to software or machines, or related to materials or purchasing from outside the economic unit, or related to the way work is performed, or to the available facilities, flexibility of management, politics and others, it is possible to build a cause and effect scheme (Fish bone) took into account the shape of the fin of the fish in the causes and effects and its purpose is to find detailed analyzes of the causes of the problem. (Suhas 2016,65), as it is one of the basic tools for quality, and the cause and effect diagram helps to facilitate the knowledge of complex problems and turn them into small problems that can be Finding solutions to them. This plan also aims to focus attention on and maximize the positive impact.

The third topic

practical framework

This topic aims to present the results reached by means of the checklist and the cause and effect diagram using statistical means, and to reach the extent of

application of the terms of the international standard ISO14001:2015, as well as the use of the cause and effect diagram, so the research hypotheses will be tested according to the hypotheses that were formulated in the topic. the first.

tools that were tested in this study as tools to identify the availability of standard requirements in the organization in question, and these tools are (checklist and cause and effect diagram). Ishikawa diagram.

Based on the foregoing, this topic reviews the mechanism for verifying the terms of the international standard (ISO14001: 2015) through the quality measurement

Analysis of the first main hypothesis (H1)(there is no gap in the level of availability of ISO14001:2015 in the Mosul Municipality Directorate).

Table(1)

The level of availability of the provisions of ISO 14001: 2015 in the Directorate of Mosul Municipality

Item No	Description Item	Arithmetic mean	Percentage of application extent%	gap ratio%
4	organization context	1.3	20.83	79.17
5	Leadership	2.7	44.33	55.67
6	Planning	2.3	38.33	61.67
7	Attribution	3.1	52.33	47.67
8	Processes	3.3	55.5	44.5
9	Performance evaluation	2.7	44.33	55.67
10	Improve	0.2	3.33	96.67
Standard	application summary	2.2	36.99	63.01

Source: Prepared by the researchers based on the results of the checklist.

It is evident from Table (1) that item (8) got the highest percentage among the rest of the items, as the percentage of application for this item reached (55.5%), and then item (7) got the percentage of application (52.33%). These results indicate that Pointing out that item (4,5) is partially implemented in the Mosul Municipality Directorate, which means that it pays attention to obtaining the international standard (ISO14001: 2015), as for items

(4,5,6,9,10) they obtained a percentage Few matching among the rest of the items, meaning that there is a gap in the application of these items in the Mosul Municipality Directorate, so it must address this gap in order to be qualified to obtain the specification for the environmental management system.

The summary of the application of the specification indicates that the arithmetic mean of the items was (2.2) and the total percentage of the extent of the application of the items was (36.99%), which is a very weak percentage with a gap of (63.01%). This result indicates the rejection of the second main hypothesis, and the acceptance of the alternative hypothesis that states that (There is a gap in the level of availability of ISO14001:2015 standards in the Mosul Municipality Directorate)

Analysis of the second main hypothesis(H2) (some quality measurement tools cannot be used in the application of ISO14001:2015).

There are a set of quality measurement tools that we mentioned in the second chapter, so some of the quality

Table(2)Directorate.

Main and subsidiary causes of environmental management system problems

main reasons	organization context	Leadership	Planning	Attribution	Processes	Performance evaluation	Improve
Sub causes	Misunderstanding and perception	Weak leadership and commitment	complex procedure	poor resources	Poor planning and control of operations	Weak monitoring, measurement, analysis and evaluation	Non-conformity and corrective action
	Misunderstanding the needs and expectations of customers	The absence of an environmental policy	Failure to achieve environmental goals	poor communication	Delays in emergency preparedness and response	Poor management review	General weakness in continuous improvement

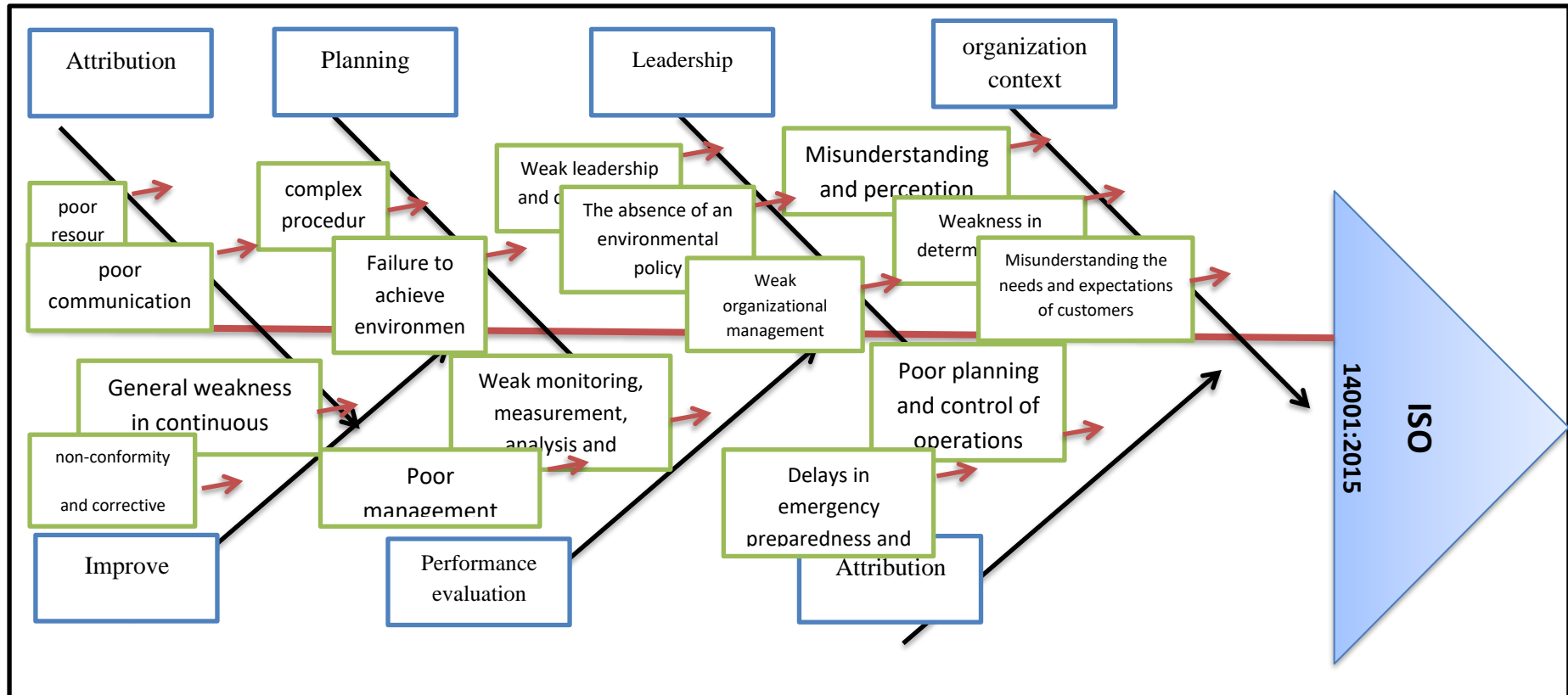
Source: Prepared by the researchers

measurement tools will be adopted in the Mosul Municipality Directorate, which were included in the flow chart of the study, as follows:

Cause and Effect Diagram (Ishikawa)

It is also called the fishbone diagram, and this map shows the causes of the problem and the relationship of these reasons to the problem itself. For the problem, then the secondary branches branching from the main branches of the center line are drawn and the secondary causes are placed on them.

The following table shows the main and subsidiary causes of the problems of the environmental management system ISO 14001:2015 about the Mosul Municipality



Source: Prepared by the researchers

Figure(1)

Cause and Effect Diagram

We note from Figure (1) that the lines branching from the main line represent the main causes, while the squares branching from the subsidiary lines represent the secondary causes, as the fishbone diagram indicates the cause and effect that the Mosul Municipality Directorate passes through to obtain a certificate (ISO14001:2015).

As it turns out that in the context of the organization, there are secondary reasons that hinder the municipality of Mosul in obtaining the specification, and that these reasons lie in misunderstanding and perception and weakness in the definition of (QMS) Quality Management System, as well as a misunderstanding of the needs and expectations of customers, as for the leadership clause, There is a lack of leadership and commitment within the organization in question due to the absence of environmental policy and the weakness of organizational management within the organization in question.

With regard to the planning item, it was found that there are reasons that stand in the way of the Mosul Municipality Directorate because of the complex procedures and the failure to achieve environmental goals. With regard to the item of support, there are two reasons that impede the researched organization from obtaining the ISO certificate, the first is poor resources, and the second is poor communications.

With regard to the operations item, the reasons for this item lie in poor planning and control of operations within the Mosul municipality directorate and the delay in preparing and responding to emergencies, so the organization in question must address this matter. The item on improvement operations, as the

organization in question faces a general weakness in continuous improvement, which is the backbone of every organization, whether it is service or production, in addition to the fact that there is a lack of conformity in the corrective measures of the Mosul Municipality Directorate.

The fourth topic

Conclusions and Suggestions

First: the conclusions

1-Weak improvement procedures on the procedures related to the environmental management system and in line with the requirements of (ISO14001:2015) to work accordingly to fulfill the requirements of the standard.

2-The lack of awareness of the employees of the importance of the environmental management system and the process of continuous improvement and the extent of its contribution to achieving environmental sustainability.

3-Weakness in corrective actions regarding diagnosing and documenting cases, developing solutions and following up on the correction process.

4-Through the results presented in the checklist and the Ishkai scheme, it was found that there is a slowdown in achieving the environmental goals that have been set and the responsibility for their application or implementation is determined according to a pre-prepared schedule, in addition to the fact that there

is a division in the Environmental Department (Occupational Health and Safety and Environmental Management Division) Which is supposed to be its main objective is how to implement the international standard (ISO14001:2015) and follow-up and control, but it does not exist in reality

5-There is a weakness in holding seminars, courses and workshops that would enhance environmental interest and awareness, as well as the limited environmental interest and awareness among most of the employees of the Mosul Municipality Directorate.

6-Not focusing on the process of continuous improvement, which would enhance the effectiveness and activity of the process of developing and applying the environmental management system in general.

Second: suggestions

The first suggestion: The Mosul Municipality Directorate should adopt the implementation of the ISO14001:2015 specification for the environmental management system approved by the current study.

The second suggestion: the need for the Mosul Municipality Directorate to pay attention to the requirements and tools for measuring quality in relation to its system.

The third suggestion: the managers at the higher administrative levels in the Mosul Municipality Directorate should support the environmental management system.

The fourth suggestion: conducting continuous improvement processes and making this a context for the work of the Mosul Municipality Directorate in Nineveh Governorate, because there is a severe weakness in the field investigated in the application of continuous improvement processes.

The Fifth suggestion: The need to rely on work within the team work group or the so-called team work and diversify the skill of working individuals.

References

- 1- Aichouni, Mohamed a. & Benchicon, Soraya a. (2014), back to basics-the (seven basic quality tools and their applications in manufacturing and services) college of technology, hail, saudi arabia.
- 2- Allam, Abdel Rahim, (2015), Environmental Management System, The State of Arab Countries, Arab Administrative Development Organization, working paper.
- 3- Allan S. Morris, (2014), ISO 14000 Environmental Management Standards, Handbook. AVL, USA.
- 4- Al-Obaidi, Abdul-Jabbar Muhammad, (2012), The Myth of Sustainable Development, Dar Al-Hamid Publishing, Jordan.
- 5- Charles Horngren, T., Dater, Srikant M., & Foster, George, (2012), Cost Accounting: A Managerial Emphasis, 14th ed., pearson prentice-Hall, USA.
- 6- Gilberto Santos, Manuel Rebelo, Nuno Lopes, M. Rui Alves and Rui Silva, (2016), "Implementing and certifying ISO 14001 in

- Portugal: motives, difficulties and benefits after ISO 9001 certification", Journal of Total Quality Management, 2016, Vol. 27, No. 11.
- 7- Grover. (2017) Kaizen costing :A catalyst for change and continuous cost improvement, International journal of management research ,Vol.2,No. 1
- 8- Horngren,Charles T.,Dater,Srikant M.,&Foster,George, (2012),Cost Accounting: A Managerial Emphasis) 10th ed., pearson prentice –Hall,USA.
- 9- Lftah khalaf, A.,(2016), Environmental Management as an Entry Point to Achieve Sustainable Development with Reference to Reality Sustainable Development in Iraq. Engineering and Technology Journal,Vol 34,No.4.
- 10- Naza'i, Azzedine and Mohamed, Ramli and Zainab, Hamdan, (2021), the extent to which environmental quality management systems in Algerian industrial enterprises are compatible with the ISO environmental management system, 14001.1401, the first Maghreb international conference on developments sustainable development.
- 11- Noia, A. E., & Nicoletti, G. M.,(2016), ISO 14001 Certification: Benefits, Costs And Expectations For Organization Studia Oeconomica Posnaniensia ,Vol.4,No.10.
- 12- Sierra, E,(1996), The New ISO 14000 Series: What Exporters Should Know, (I. T. Center, Éd.) International Trade Forum.
- 13- Suhas,h.k.,(2016), From Quality Virtual Corporation-an Integrated Approach)narose publishing house.
- 14- Summers,Donna C.S.,(2007),(Quality)Prentice,Hall,Inc,New Jersey USA .