Visual Management and its Impact on Reducing Wastage (3M) According to the Perspective of the Agile 7S Methodology: An Applied Study in Al-Rayan Company

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Abstract. The main objectives of this study are to:1) Determine the requirements for applying visual management strategies, and their relevance to the reduction of (3M) waste through the (7S) methodology:2) Recognizing the impact of each dimension of visual management on reducing waste and arranging them in terms of the level of importance. This research was carried out in (35) persons from the technical and administrative staff in the study sample company. and questionnaires were used to collect data. SMART-PLS 3.0 was used to test the hypothesis. The findings result proved that there is a correlation between visual management of (0.64) with the (7S)methodology, and it is significant at the level of significance (0.05). and Working individuals realize that drawing up a set of strategic plans in the company's departments is one of the priorities of administrative work and a basic requirement of visual management to reduce the waste and waste that occur in all the company's business.

Keywords: Visual Management, VM, Visual Management Strategies, VMS, 7S, Waste 3M.

1 Introduction

Visual management is a modern method of management and one of the most important reasons for the success of the Japanese experience, which calls for achieving several goals, such as increasing the level of transparency and the ability to communicate between the general personnel of the organization, as well as stimulating and raising morale among working individuals [1], [18]. The success of the application of visual management depends on some of the requirements in industrial organizations. [2] such as leadership, commitment, work team…etc. So, visual management (VM) is a workplace where all working individuals understand and manage their work in a safe, clean and orderly environment that promotes open communication and continuous improvement, as the visual management (VM) provides real-time information on the state of the workplace through a set of means of visual information Simple and effective, which allows working individuals to understand their effects on work as well as improve organizational performance, and this is in line with the (7 S) methodology that consists of seven stages: classification, arrangement, cleanliness, standardization, self-discipline, safety and team spirit (cooperation) as it works. Each stage continuously improves the performance of the organization by eliminating all forms of waste and maintaining a clean and safe work environment, which is reflected in improving the morale of workers. Improving the morale of workers is a qualitative form responsible for reducing the manufacturing lead time [8]. (All of this helps to get rid of all kinds of waste related to uncertainty and time Waiting and searching for relevant information and so on by eliminating what is unnecessary and leaving everything clear and predictable, as well as reducing clutter as the necessary elements are always in the same places and work is easier and faster and this contributes to achieving the goals of the organization and reducing waste. Muda (losses), Mura (difference), and Muri (overload-strain) and complete assigned tasks quickly and accurately [13].

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2 Research Methodology

2.1 The research Problem

The concept of visual management and its strategies has received great attention by researchers and writers, as a modern and effective administrative method in enhancing the culture of the organization with modern productive approaches that are in line with the developments of the era characterized by dynamic changes and high speed in providing products and services. Realizes the concept and importance of Visual Management (VM) and its strategies based on clear scientific foundations, which will reduce waste and improve resource utilization, hence the researchers' desire to know the role played by visual management in reducing waste using the (7S) methodology. so, the research problem is reflected in the following main question : (What is the effect of visual management in reducing waste (Muri, Muda, Mura) using the (7S) methodology)?

2.2 The Importance of Research

The importance of the research is trying to bridge the knowledge gap in the literature in one of the controversial topics in the field of production and operations management by linking the variables (Visual Management, 3M, 7S) to achieve a clear understanding of the concepts used, and determine their importance and objectives, Besides measure the extent to which the visual management strategies are applied in the company under study, and to determine the role that the visual management plays in the company to reduce waste (3M) through the use of the (7S) methodology in the Iraqi environment.

2.3 Research Objectives

1. Defining the concept of visual management by providing scientific and cognitive material that helps researchers in the field of production and operations management.
2. Determine the requirements for applying visual management strategies, and their relevance to the reduction of (3M) waste through the (7S) methodology.
3. Recognizing the impact of each dimension of visual management on reducing waste and arranging them in terms of the level of importance.
4. Introducing industrial companies to one of the modern methods of quality systems, specifically the (7S), by proving its benefits in a clear practical way.

2.4 Proposed Conceptual Model

The. The model consists of three main dimensions (visual management, 3M & 7S), the independent dimension (visual management) consists of three sub-dimensions, namely (strategy of setting work rules, purification strategy, strategy to eliminate waste), and the dependent dimension consists of (3M).) from three sub-dimensions (Muri, Muda, Mura), and the mediating variable is the (7S) methodology as shown in Figure (1) the hypothetical research model.

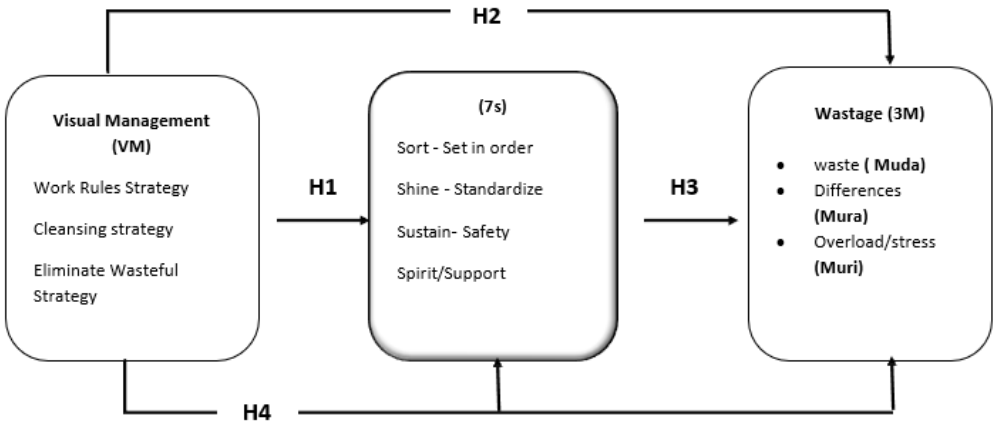

Fig 1. Proposed Conceptual Model.

2.5 The Following Hypotheses were Tested

1. The first main hypothesis: There is an influential relationship between the visual management strategies (VM) and the (7S) methodology.
2. The second main hypothesis: There is an effective relationship between visual management strategies (VM) and waste reduction (3M).
3. The third main hypothesis: There is an effective relationship between the (7S) methodology and waste reduction (3M).
4. .The fourth main hypothesis: There is an influence relationship between visual management (VM) and waste reduction (3M) using the (7S) methodology.

2.6 Research Methodology

The study used the descriptive-analytical method to achieve the goal of the study by verifying the relationship between visual management (VM) and wastage(3M) through the mediating variable(7S) methodology in Al Rayan Dairy Production. The questionnaire was used as the main tool for data collection. It was distributed to the study sample, which numbered (35) heads of departments and workers in the production department, and a five-point Likert scale was applied.

3 Theoretical Frameworks

3.1 Visual Management

Visual management (VM) is one of the core practices of an agile production system and an important management approach to information sharing and more transparency of work, as the reliance on vision during the execution of tasks has been observed by humans even before research confirms its importance [14]. In particular, [7] showed the contribution of each of the five senses to the processes of learning and analysis and found that sight contributed up to 75 percent of human perception, learning, and activity, with the visual system being the system with the highest ability to process information Of all the functions of the human brain, these findings could explain why many organizations, especially industrial organizations, advocate the use of simple and clear visual tools to communicate with workers [7]. Thus, visual management (VM) has constituted a new dimension of the processes, systems, and structures that make up an organization based on the use of graphical visualization techniques to increase focus on performance, according to [18]. There is a conflict of terminology when describing the use of visual methods to support management throughout Organization, some of the terms used are visual management, visual workplace, visual control, visual factory, visual aids, and visual communication [7].

The term visual management is used, which defines it [10] as "a management system that attempts to improve organizational performance by linking and aligning organizational vision,

core values, goals, and culture with other management systems, stakeholders, processes as well as the workplace, using stimuli, which address Direct one of the five senses (sight, hearing, feeling, smell, and taste)". Thus, visual management is "a self-interpreting, self-regulating work environment, where it happens, what is supposed to happen, at what time, day or night, which is a term It is used to refer to the method that makes work procedures visible to improve workflow,". As he knows it, It is [18] that "it is a management strategy that proposes to share relevant and easily understandable sensory information".

3.1.1 The Dimensions of visual management

Three important strategies can be summarized as follows: [4,1,2].

a) **Work Rules Strategy:** It is the organization's rules or a set of practical procedures that it sets and that are clear and specific in a way that serves its mission optimally to constantly improve and develop work. These rules are characterized by being scalable and adjustable to become simple and effective and keep pace with the culture of speed that describes the new world order, which includes defining tasks, practical procedures for implementation, methods, and standards for performance and evaluation through an objective study and a simple and clear scientific approach.

b) **Cleaning Strategy:** An important strategy that refers to organizing work and eliminating obstacles by diagnosing the organization's problems and accurately identifying performance gaps and their causes, so that it can develop appropriate solutions and develop plans to improve performance in the light of specific criteria, and of course it may be among the methods of solutions The dimensions of some leaders that impede the progress of work, and this strategy does not stop at this point, but extends to addressing the various tools, methods, and policies, as it is characterized as the most important means of continuous development and accordingly, change must be one of the values and concepts necessary to meet the challenges of the future.

c) **Eliminate Wasteful Strategy:** This strategy aims to get rid of unnecessary activities and procedures that do not add anything real to the work output and to introduce the value of speed into the culture of the organization, as there are many ways to waste material and human resources despite their scarcity, including wasting time Which is one of the most important types of waste, and it is through taking some routine administrative decisions in several days or even months, which hinders the interest of the organization and employees and disrupts the workflow. Those working behind it gain nothing but fear, doubt, hesitation, slowdown, complexity, and obstruction.

3.2 The Concept of the(7S) Methodology

The 7S methodology is rooted in the Japanese 5S methodology of sorting, arranging, brilliance, standardization, and self-discipline. In recent years, two pillars have been added, safety and team spirit (cooperation). The 5S methodology arose in the aftermath of World War II as part of the quality movement In Japan, the term was formally coined by Takashi Osada in 1980 [6]. [5] sees the 5S methodology as "a stage of workplace organization that has an impact on the efficiency, quality, and safety of workers." (5S) is one of the ways to create a comfortable and safe work environment within the organization so that the working individuals have a good work culture. [13] refers to it as "a valuable methodology to enhance and improve the productivity of organizations as it can enhance communication and help workers to be effective.", and generate concepts that contribute to reducing downtime, delivery times, inventory, defects, and related expenses." According to Japanese organizations, the 5S methodology has two aspects, the first is a high level of supervision of its proper implementation which explains the ideal performance, and the other is the provision of management Good and tools required, on Although the 5S methodology works to provide a clean and healthy workplace, it supports improving productivity and raising the performance of organizations, so the 5S methodology is one of the most well-known methodologies in the industrial environment [11].

6S, as an extension of 5S, is described as a team-oriented methodology, and this concept can be applied to achieve desired results within industrial organizations, as the basic idea of expanding the methodology from 5S to 6S is to provide continuous improvement by creating safety awareness Reducing the number of accidents and injuries in work environments [11] It provides a continuous improvement as well as enhances safety awareness. [16] sees the 6S methodology as "an advanced technology aimed at achieving a safe working environment for workers", is a methodology 6S is an essential measure for discipline and encouraging a culture of continuous improvement, and the main goal of the (6S) methodology is to reduce all faults in the industrial environment, which increases the productivity of organizations, achieving better quality products and a safe work environment, as well as meeting the needs and desires of customers. (6S) in any organization that seeks to improve its performance by reducing (80-90%) of the time in handling materials and searching for tools in the workplace, which gives a quick response to any problem that occurs in the workplace and works to solve it very quickly.

As a result of the developments, this methodology has become composed of seven pillars after adding the spirit of cooperation between team members, which is the (7S) to the (6S) methodology, which enhances the cohesion of the work team. [11] sees the (7S) methodology as "a methodology Continuously improve the work environment by classifying and arranging materials and tools, extensive cleaning, standardization and (self-discipline) maintaining what has been achieved by compiling work instructions and standard operating procedures for working personnel, eliminating most accidents in the workplace (occupational safety). [8] considers it "a simple and practical approach to building a culture of quality in the workplace that is relatively easy to do and requires few additional resources. The investment in time and effort pays off much more when results are achieved and maintained".

3.2.1 Dimensions of (7S) Methodology

This methodology includes seven main dimensions as follows [17,13,11]:

a) **Sort:** It is the process of removing all items that are not necessary for the current production from the work area; for example, distinguishing between what is needed and not wanted in the work area and getting rid of what is not needed, selecting and sorting workplace items into two main categories, important and unimportant An attempt to eliminate unused or rarely used items that pile up and cause disruptions.

b) **Set in order:** Arrange and distinguish items in such a way that they are easy to find and use, while sorting helps us identify what items are needed, order helps us decide how they should be placed; for example, everything should be placed according to its position so that it is ready for use when needed.

c) **Shine:** Refers to the need to keep the workplace clean. In Japanese industrial organizations, cleaning is a daily activity. At the end of each work, the work area is cleaned, and everything is returned to its place.

d) **Standardize:** Create a consistent way to carry out tasks and procedures, and this is done to ensure that the situation does not deteriorate back to the state it was in before the implementation of 1S, 2S, and S3, and the purpose of standardization is to ensure that everyone in the organization follows the same procedure, the same Item names, same size signs/floor marks, shapes, colours, and so on.

e) **Sustain-Self-Discipline:** Sustainability also means discipline which denotes commitment and preservation of the system and past practices in 1S, 2S, S3, and S4 as a way of life and the main objective is to give workers the commitment and motivation to follow each step, day in and day.

f) **Safety:** The condition of being protected from any kind of physical, social, spiritual, financial, political, emotional, occupational, psychological, or educational consequences.

g) **Spirit/support-Collaboration:** It is the desire to work and cooperate between senior management and individuals working in a team spirit.

3.3 Waste 3 M (Mura, Muri, Muda)

There are three types of waste, which are as follows [9]:

a) **Overload/stress (Muri):** Muri is defined as "the stress to which working personnel or equipment are subjected and refers to any action related to an appreciable physical or psychological stress" [15]. Examples of Muri include workers repeatedly bending over due to work, lifting Heavyweights, or repetition of tiring mental and physical actions, with client deadlines that are too short compared to the individual skill level of the workers [3].

b) **Differences (Mura):** (Mura) is the differences and discrepancies that occur in the process such as misalignment and irregularity of tasks, and if there is (Mura) in the organization it means there is a high possibility of overloading workers or machines (Muri) [9]. This (Mura) identifies differences and asymmetries in the process, for example, irregular use of the individual worker or machine, which must be reduced or eliminated to avoid the occurrence of (Muri) in any value-added production resource that causes (Muda). [15].

c) **Waste (Muda):** (Muda) Waste caused by (Muri, Mura) is any activity or process that does not add value and is a physical waste of time, resources, and money. Muda covers seven forms of wastage categorized by Taiichi Ohno within the Toyota Production System: Overproduction, Inventory, transportation, waiting, movement, additional processing, defects in the product, and recently the eighth type of loss has appeared: untapped talent [15].

4 The Practical Side

4.1 Analysing the Results of the Correlation Between the Dimensions and Variables of the Research

This paragraph aims to verify the extent of the validity of the main research hypotheses and the sub-hypotheses emanating from them using the (Smart PLS) program .Main and several sub-hypotheses that test a correlation between visual management and its dimensions and the (7S) methodology, and test correlations between visual management and wastage, as well as testing a correlation between the (7S)and wasted methodology. Table 1 shows the matrix of correlations between the dimensions and variables of the research.

Table 1. Correlations between research dimensions and variables.

Correlations									
Y	Y3	Y2	Y1	M	X	X3	X2	X1	
-.236**	-.261**	-.046	-.250**	.226**	.160**	.005	.388**	1	**X1**
-.404**	-.226**	-.181**	-.339**	.106*	.572**	.259**	1		**X2**
-.287**	-.113*	-.219**	-.210**	.439**	.313**	1			**X3**
-.411**	-.262**	-.224**	-.323**	.639**	1				**X**
-.626**	.183**	.332**	-.300**	1					**M**
.104*	.472**	.432**	1						**Y1**
.238**	.412**	1							**Y2**
.168**	1								**Y3**
1									**Y**
****. Correlation is significant at the 0.01 level (2-tailed).**									
***. Correlation is significant at the 0.05 level (2-tailed).**									

Source: Prepared by the researchers based on the results of (SmartPls).

According to the results of Table 1, the hypotheses will be tested as follows:

a) **The first hypothesis:** The results proved that there is a correlation between visual management of (0.64) with the (7S) methodology, and it is significant at the level of significance (0.05). The results also proved that there is a correlation between the strategy

of setting business rules of (0.23) with the (7S)methodology, which is significant at the level of significance (0.05). There is also a correlation between the purification strategy of (0.11) and the (7S)methodology, which is significant at the level of significance (0.05). As for the correlation between eliminating waste, it was (0.44) with the (7S) methodology, and it is significant at the level of significance (0.05).

b) **The second hypothesis:** The results proved that there is an inverse correlation between the visual management of (-0.41) waste, which is significant at the level of significance (0.05). The results also proved that there is an inverse correlation between the strategy of setting business rules of (-0.24) waste, which is significant at the level of significance (0.05). There is also an inverse correlation between the purification strategy of -0.40, which is significant at the level of significance (0.05). As for the inverse correlation of wastage elimination, it was (-0.29), and it was of significant significance at (0.05).

c) **The third hypothesis:** The results proved that there is an inverse correlation between the (7S)methodology of (-0.63) waste, which is significant at the level of significance (0.05).

4.2 To Test the Hypotheses of the Two Dimensions and Variables of the Research

a) **The first hypothesis:** The researcher assumes the existence of a positive influence relationship for visual management and its dimensions. the results appear in each of Figure (2), the effect coefficient. Between visual management and the (7S)methodology, and figure (3) presents the influence coefficient for the dimensions of visual management in the (7S)methodology, and the results will be presented in Table (2), which are as follows:

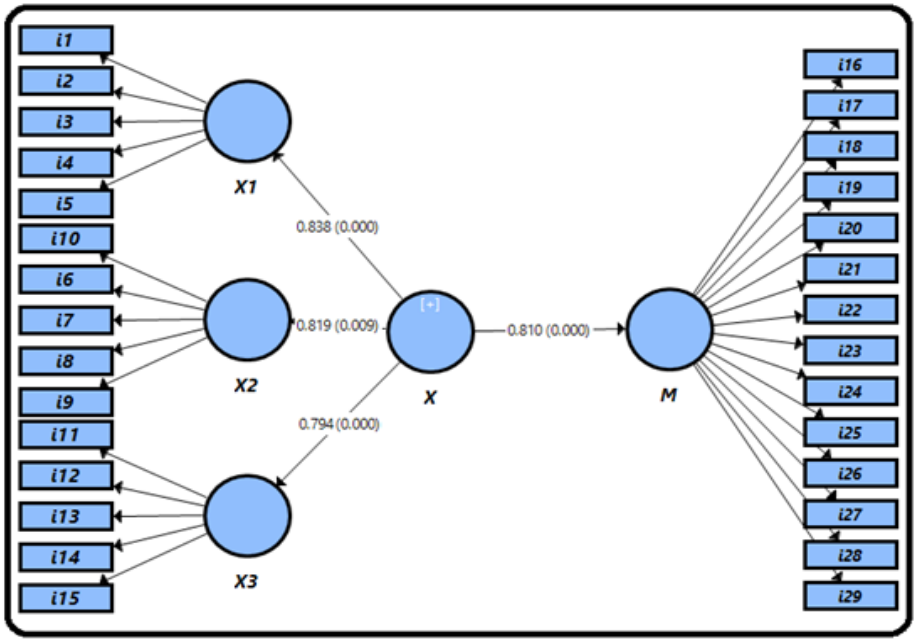

Fig 2. Impact factor for visual management in the (7S) methodology
Source: Prepared by the researchers based on the results of (SmartPls).

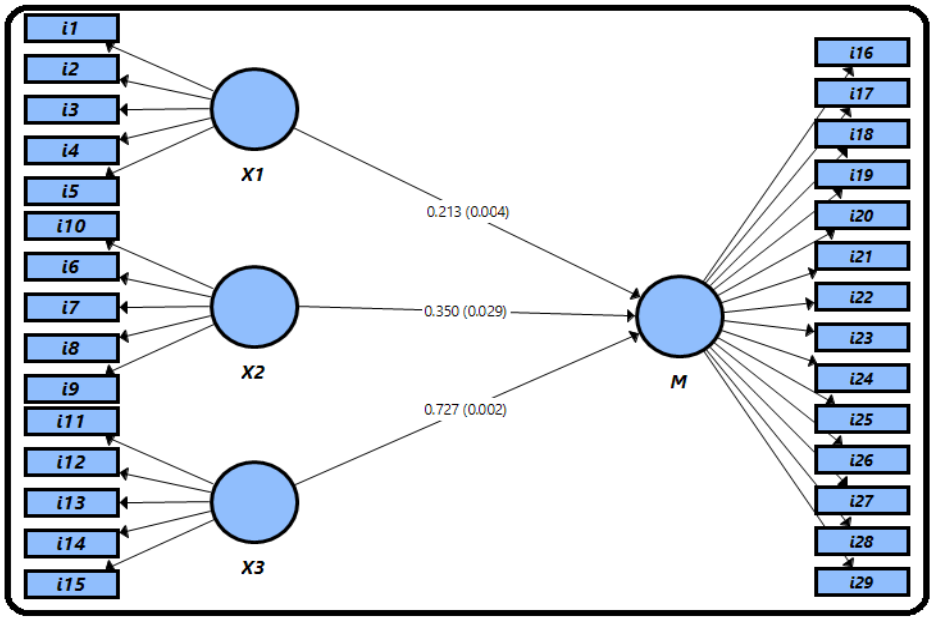

Fig 3. The influence coefficient for the dimensions of visual management in the (7S) methodology.

Source: Prepared by the researchers based on the results of (SmartPls).

Table 2. Some tests for the impact factor of visual management and its dimensions in the 7S methodology.

	Original Sample (O)	R^2	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
X -> M	0.810	0.66	0.092	8.852	0.000
X1 -> M	0.213		0.085	2.494	0.004
X2 -> M	0.350		0.036	9.777	0.029
X3 -> M	0.727		0.096	7.598	0.002

Source: Prepared by the researchers based on the results of (SmartPls).

According to Figs 2, 3, and Table 2, visual management explains the amount of (0.66) of the variation occurring in the (7S)methodology, and the visual management's effect in the (7S)methodology has been estimated at (0.81), which is significant at the level of significance (0.05). As for the effect of the visual management dimensions in the (7S)methodology, the effect of the strategy of setting business rules in the (7S)methodology was estimated at (0.21), which is significant at the level of significance (0.05). The effect of the purification strategy in the (7S)methodology was estimated at (0.35), which is significant at the level of significance (0.05). As for the effect of the strategy to eliminate waste in the (7S)methodology, it was estimated at (0.73), which is significant at the level of significance (0.05).

b) **The second hypothesis:** The researcher assumes the existence of a negative influence relationship for the visual management and its dimensions (strategy of setting business rules, purification strategy, strategy to eliminate waste) on waste, and it will be tested according to simple and multiple regression and the results appear in each of Fig 4 the influence coefficient between management As for the Fig 5 displays the impact factor for the dimensions of the visual management in the waste, and the results will be presented in Table 3, which are as follows:

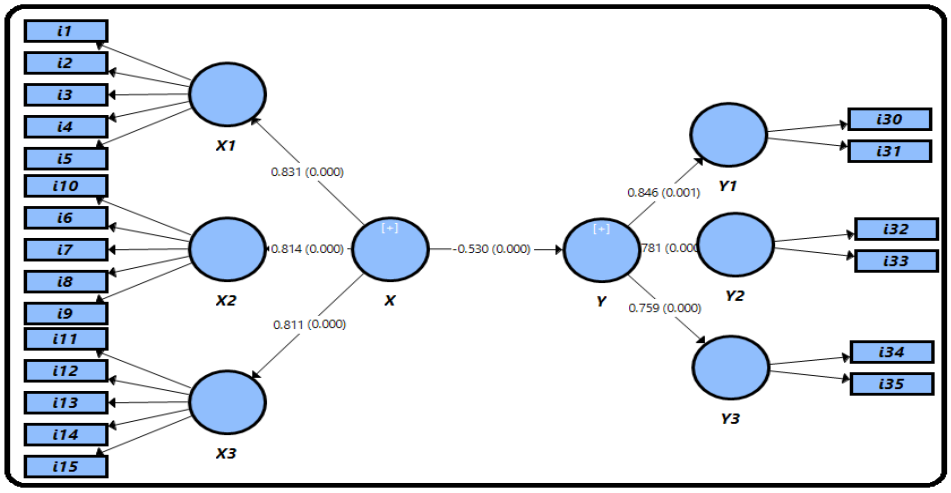

Fig 4. Impact factor for visual management on waste.
Source: Prepared by the researchers based on the results of (SmartPls).

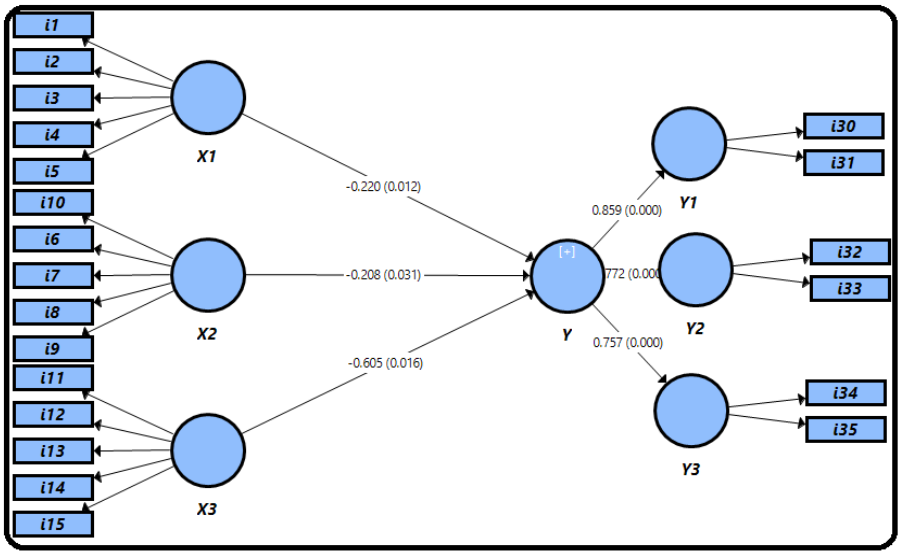

Fig 5. Impact factor for the dimensions of visual management in waste

Source: Prepared by the researchers based on the results of (SmartPls).

Table 3. Some tests for the impact factor of visual management and its dimensions in waste

	Original Sample (O)	R^2	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
X -> Y	-0.530		0.139	-3.818	0.000
X1 -> Y	-0.220		0.112	-1.967	0.012
X2 -> Y	-0.208		0.104	-2.000	0.031
X3 -> Y	-0.605		0.200	-3.027	0.016

Source: Prepared by the researchers based on the results of (SmartPls).

According to Figs 4 and 5 and Table 3, the visual management explains the amount of (0.28) of the variance in the waste, and the effect of visual management on the waste has been estimated at (-0.53), which is significant at the level of significance (0.05). . As for the effect of the visual management dimensions on waste, the effect of the business rule-setting strategy on waste was estimated at (-0.22), which is significant at (0.05). The effect of the purification

strategy on waste was estimated at (-0.21), which is significant at the level of significance (0.05). As for the effect of the strategy to eliminate waste on waste, it was estimated at (-0.61), which is significant at the level of significance (0.05).

c) **The third hypothesis:** The researcher assumes that there is a negative impact relationship between the (7S)methodology in loss, and it will be tested according to simple regression. Come:

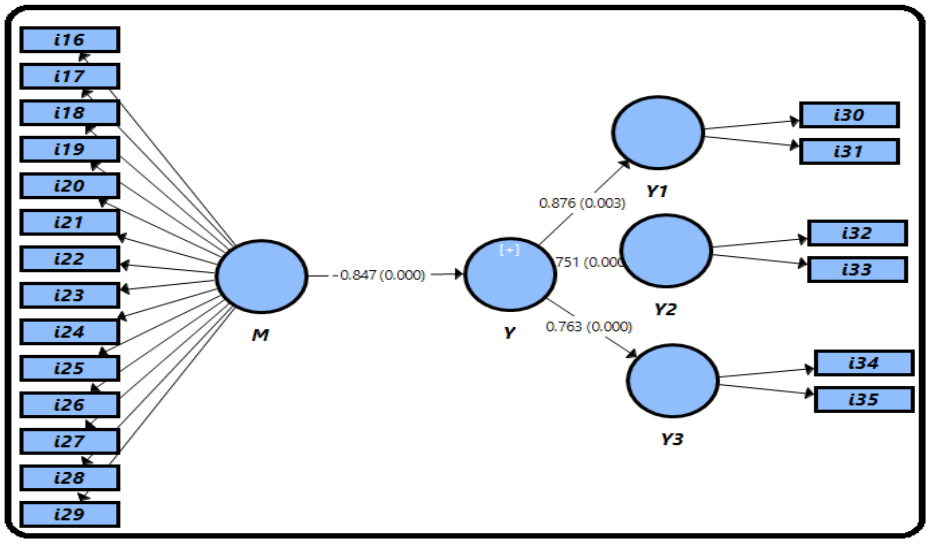

Fig 6. Impact Factor, (7S) Lost Methodology.

Source: Prepared by the researchers based on the results of (SmartPls).

Table 4. Some tests of the effect factor of the 7S methodology and its dimensions on Waste

	Original Sample (O)	R^2	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
M -> Y	-0.847	0.72	0.051	-16.608	0

Source: Prepared by the researchers based on the results of (SmartPls).

According to Fig 6 and Table 4, the (7S)methodology explains the amount of (0.72) of the variation in the waste, and the effect of the (7S)methodology on the waste has been estimated at (-0.85), which is significant at the level of significance (0.05).

d) **The fourth hypothesis:** The researcher assumes the existence of a negative influence relationship of visual management on waste through the 7S methodology, and it will be tested according to path analysis. The results appear in each of Fig 7 the influence coefficient between visual management and waste through the 7S methodology, and the results will be presented in Fig 7 The results in Table 5 are as follows:

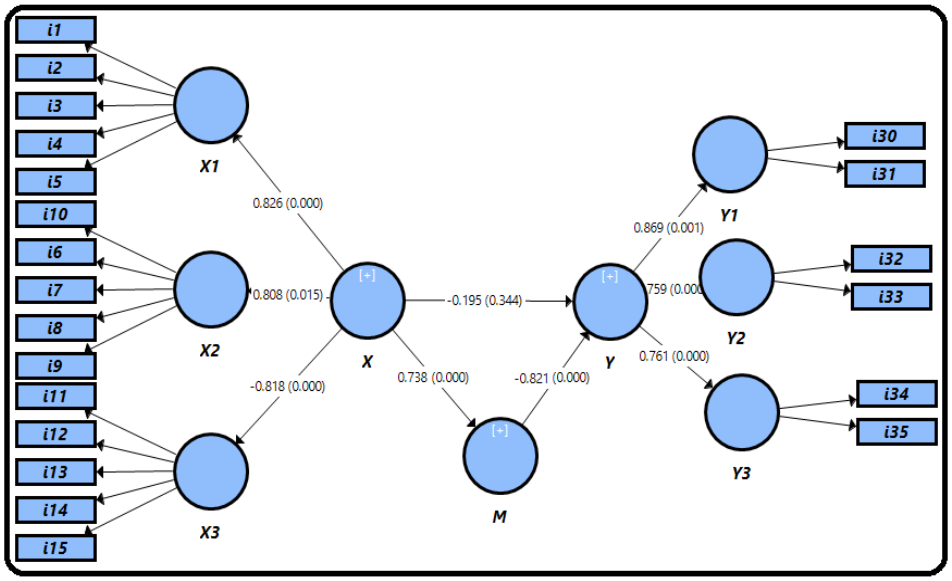

Fig 7. Impact coefficient for visual loss management.

Source: Prepared by the researchers based on the results of (SmartPls).

Table 5. Some tests for the impact factor of visual management and its dimensions in waste through the (7S)methodology

	Original Sample (O)	R^2	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
X -> Y	-0.195	0.75	0.206	-0.947	0.344
X -> M	0.738		0.147	5.014	0.000
M -> Y	-0.821		0.155	-5.283	0.000
X -> M->Y	-0.606		0.023	-26.487	0.000

Source: Prepared by the researchers based on the results of (SmartPls).

According to Fig 7 and Table 5, the visual management and the (7S)methodology explain the amount of (0.75) of the variance in the waste, and the direct impact of the visual management on the waste was estimated at (0.19), which is not significant at the level of significance (0.05). As for the overall effect of visual management on waste through the (7S)methodology, it reached (-0.61), which is significant over the level of significance (0.05), and this indicates that the independent variable will further reduce the waste.

5 Conclusions and Recommendations

The following lists are conclusions:

1. The possibility of applying the visual management strategies in the company under study to reduce waste and waste according to the (7S) methodology, through the results of the average sample answers about the main and sub-variables of the research.
2. The company's senior management is not interested in developing appropriate mechanisms to reward distinguished employees.
3. Working individuals realize that drawing up a set of strategic plans in the company's departments is one of the priorities of administrative work and a basic requirement of visual management to reduce the waste and waste that occur in all the company's business.
4. There is a limitation in guiding working individuals to enhance their abilities and skills, as well as encouraging individual initiatives towards creativity and innovation in the company under study.
5. The company under study focuses continuously on developing the competitive position at the local level, and this was confirmed by the answers of the sample most of the individuals working in the company under study are not interested in performing their

duties without supervision or control, which reflects the lack of ability to assume work responsibilities.

6. Through the analysis and interpretation of the results, it was found that the new (7S) methodology can have significant positive results on the performance of the organization when implemented effectively, by reducing various waste, organizing work areas, and enhancing hygiene in addition to team cohesion, and it is impossible to imagine 7(S) gains full value in the company if there are too many hurdles that cannot be addressed and removed.

The following lists are some recommendations:

1. Work on removing all obstacles that weaken the possibility of applying visual management strategies, by spreading the culture of visual management and making it in line with the values, beliefs, norms, and organizational expectations in the company
2. Ensuring the provision of the basic requirements that have an influential role in the process of improving leadership styles in light of this administrative style.
3. The need for senior management to support and encourage working individuals to present individual ideas and initiatives that would push the company towards creativity and innovation.
4. Emphasis on the visual management(VM) trends that call for the involvement of workers more in the decision-making process and work in a team spirit, as a large part of the success of applying the (7S) methodology is due to the management's ability to encourage employees to participate in the work team.
5. Forming higher control committees that adopt agreed performance standards to follow up on the progress of work in the company.
6. Develop appropriate mechanisms to reward distinguished workers by organizing competitions between departments within the company and evaluating workers in it to encourage them to develop and improve work.

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