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THE IMPACT OF THE DMAIC MODEL IN WASTE REDUCTION: AN ANALYTICAL STUDY OF THE OPINIONS OF A SAMPLE OF EMPLOYEES AT ZAIN IRAQ TELECOMMUNICATIONS COMPANY

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Abstract
The current study aims to test the effect of the (DMAIC) model in reducing Waste in Zain Iraq Telecommunications Company, and to identify the reality of the company's situation, the study community, and help it solve the problems it faces and develop appropriate solutions to overcome these problems and deal with the changing environment effectively and efficiently. The study adopted the comprehensive inventory method, meaning that the study community is the same as the study sample, and on this basis, an electronic form was approved to be distributed to the target sample through agreement with the company's public relations department. Accordingly, the study sample included (282) valid answers for analysis from a community of (290). The descriptive analytical approach was relied upon in this study.

Keywords: DMAIC, Waste Reduction, Zain Iraq.

Introduction

In the past few years and to this day, organizations have witnessed a state of great change in their markets and operations, resulting from the rapid transformations towards globalization and the unprecedented openness of the divides and borders between countries, which increased the intensity of competition between them, which required organizations to think about a preliminary drawing of the appropriate strategy for their work and determine their directions, and search in various fields for distinct work methods, capabilities and possibilities that enable them to survive and adapt to the rapid environmental changes, as we witnessed in the last years of the last century the adoption of a set of Six Sigma standards (DMAIC model, statistical process control, total quality management, and lean thinking. Whatever the type of organization (production or service), it competes for its market share in terms of quality, reliability and timely delivery. Since the services sector has become the most important element in economies in recent years, in industrialized countries it constitutes (50%) of the gross domestic product. From this standpoint, the importance of this study came to contribute to clarifying the impact of the DMAIC model in reducing the damage in Zain Iraq Telecommunications Company.

1. Study methodology

1.1 The problem of the study

Business organizations are witnessing a state of increasing uncertainty and sudden changes, and therefore their work environments are unstable and unpredictable. In the midst of this turmoil, the ability of working individuals to meet the needs of work and the increasing change in customer tastes has become a pivotal element and the main foundation for the survival and growth of the organization. Therefore, the issue of preserving organizations from the effects of crises has become one of the most prominent issues that attract attention in the field of management. Accordingly, the problem of the current study requires a cognitive and practical diagnosis based on a set of conceptual foundations for the study variables, such as the nature of the relationship that links them, which determines the nature of the intellectual debate surrounding their variables directly or indirectly, and the level of their field depth and their realistic representation in the organizations of the study community. On this basis, the main features of the current problem become clear by framing it with a set of the following questions— :

1-What is the level of adoption of the "DMAIC model, reducing damage" in the company of the study community?

2- What is the nature of the correlation between the study variables and their sub-dimensions in the study community company?

3- What is the extent of the impact of the (DMAIC) model in reducing damage in the study community company?

1.2 The importance of the study

The importance of the study is evident through the following:

1-The variables under study are important topics in the field of manufacturing and service operations management.

2-The importance of the study is highlighted by the fact that it will be implemented in the local telecommunications sector (Zain Iraq Company) to determine the extent of the impact of the DMAIC model in reducing damage, within the scope of its business that grants it survival, continuity and growth compared to other organizations.

3- Through the results expected to be reached, the researcher hopes to provide appropriate contributions that will help the company under study in building and formulating a clear strategy, avoiding ambiguity and paying attention to its capabilities to enhance the quality of its services.

4- Highlighting the reality of using study variables in Zain Iraq Telecommunications Company in order to diagnose the problems and obstacles it faces and to provide proposals and recommendations regarding them.

1.3 The aim of the study

The main objectives of the study were as follows:

1-To establish and consolidate the logical relationships between the main and sub-variables of the study. This can be achieved by reviewing the most important scientific proposals related to these topics and identifying the knowledge accumulations and extracting what

establishes the visions and intellectual and conceptual construction that contributes to supporting and strengthening these relationships logically, and in a way that supports the scientific content included in the study hypotheses in general.

2-To identify and reveal whether Zain Iraq Telecommunications Company has an appropriate level of application of the DMAIC model in its activities and work.

3-To clarify the relationship of association and influence between each of the DMAIC model and its sub-dimensions in reducing damage.

4- To provide decision-makers "senior management" at Zain Iraq Company with a number of mechanisms that would contribute to reducing damage

1.4The hypothetical scheme of the study

The hypothetical plan of the study represents the intellectual structure of a set of facts, which provide him with a brief and hypothetical representation of the phenomenon under study. The hypothetical plan was built based on the problem of the study and in a manner consistent with its objectives and supporting its hypotheses and intellectual and philosophical premises. Figure (1) depicts the hypothetical plan of the study

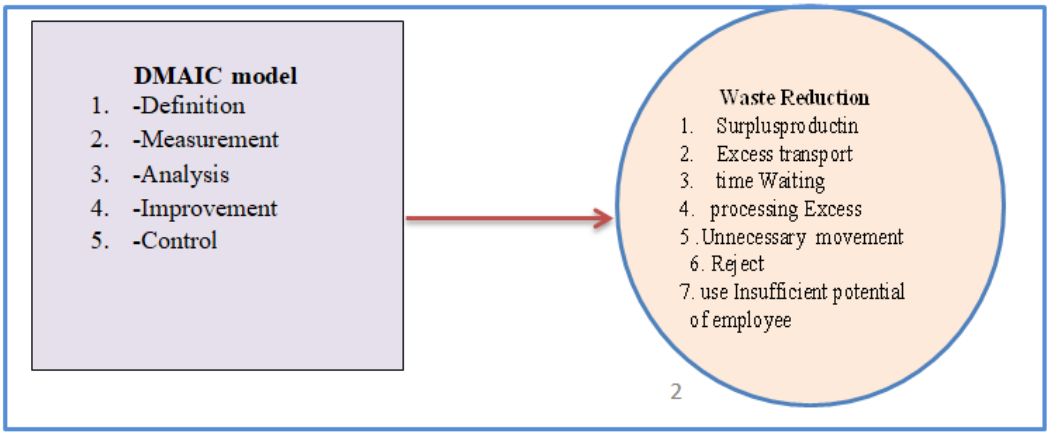

Figure (1) shows the hypothetical scheme of the study

1.5 Hypotheses of influence

Main hypothesis: There is a statistically significant influence relationship between the DMAIC model with its dimensions and the Waste reduction variable with its dimensions.

1.6 The sample of the study

A sample was selected that represented the senior and middle management leaders in Zain Iraq Telecommunications Company. The study sample included (Chairman of the Board of Directors, General Manager, Department Manager, Branch Manager, Division Manager, Unit Manager), and the study adopted the comprehensive enumeration method, meaning that the study community is the same as the study sample. Based on this, an electronic form was adopted to be distributed to the targeted sample through an agreement with the Public Relations Department in the company. Accordingly, the study sample included (282) valid answers for analysis from a community of (290), which means that the actual sample response rate reached (97%). In order to analyze and interpret the data and come up with the

best results, the study resorted to relying on two analysis packages, which are (SPSS & AMOS.V.29).

1.7 The tool of the study

The study used the questionnaire as a tool to collect data from the study sample. The questionnaire consists of two parts. The first part included the demographic data of the respondents, while the second part included the variables of the study, as it included DMAIC model (18) items by relying on the dimensions mentioned by (DeMast&Lokkerbol,2012), The variable of reducing damage reached (22) paragraphs. Based on the scale (Leksic et al.,2020). To implement the test, the Cronbach's alpha coefficient was adopted, which studies indicate is acceptable at values greater than 0.70 (Chen & Huang. 2007). By applying the test, it was found that the DMAIC model axis recorded an acceptable reliability coefficient of (0.945), and the combined axes recorded (0.946), which indicates that all axes reflect acceptable results.

DMAIC model2

2.1 The concept of DMAIC model

The first idea of using Six Sigma as a standard measure goes back to (Gauss, 1777- 1855, Frederick Carl) who came up with the idea of the "normal curve". In 1920, Walter Shewort was the first to use it as a standard measure in product changes. The actual beginning of the approach was in the Motorola Corporation, which suffered in the eighties of the last century from a major crisis due to the Japanese invasion. This concept was introduced in the early eighties of the last century by Motorola, and then this concept was developed by companies such as General Electric (GE) and Allied Signal in the late nineties (Penelope, 2008: 308). (Lennartsson & Vanhatalo, 2004:28) indicated that the DMAIC methodology is a breakthrough strategy to provide tangible results and facts as it works within the framework of variance standards, and the beginning of the model's emergence dates back to the Deming cycle as a process of improving products and services provided to the customer and working to achieve compound improvement. As for the Six Sigma concept, which was introduced by Motorola in the eighties to improve its products and maintain quality, and which was adopted by many companies as a tool for excellence in operations, its essence lies in the process of continuous improvement through the use of the DMAIC model (Define, Measure, Analyze, Improve, and Control), and since then this methodology has been adopted by many other companies to achieve their own goals, whether in producing goods or in providing services (Kenge, R & Khan, Z, 2021:536). This model was defined by (Behara et al., 1995:107-109) as a statistical measure of process or product performance used as a quality control mechanism, which seeks to reduce defects or variations in the process to 3.4 per million opportunities and thus improve production and increase customer satisfaction. While (Roman, 2020:12) defines it as a data-driven improvement cycle used to improve business processes and designs "and consists of five stages; definition, measurement, analysis, improvement and control, DMAIC is an essential element in the Six Sigma methodology that is used to eliminate defects. While (Godina et al., 2021:5) defined it as a methodology used in Six Sigma projects to improve the quality of manufacturing processes, the goal of which

is to identify and resolve the various root causes that cause defects through the already defined stages.

2.2 Dimensions of DMAIC model

1. Definition

This first stage represents a number of steps that work to define the problem, identify the customer's needs and expectations, and choose the appropriate organizational structure to determine the objectives. Therefore, it must be verified whether the procedures and practices that have been taken and related to providing solutions to the problems of the targeted operations and the services to be provided are sound and correct procedures. (Sharma et al., 2019: 526) see that at this stage, the problem begins to be understood and defined, and the process, flows, inputs and outputs are designed where improvement is targeted, and the process map is prepared. This step is extremely important before starting the project implementation. (Santos et al., 2021: 156) stressed the need to define the critical processes and objectives in light of the business and customer expectations and needs. At this stage, the work team that will organize and plan the project is identified, and people who know and master the process must be selected, and the project objectives are determined, meaning that a boundary map has been drawn up to clarify the sectors interested in the project to be developed and a map of roles and responsibilities.

2. Measurement

Efforts at this stage focus on measuring the performance of the current system, documenting the actions taken in the first stage, which are subject to continuous improvement by preparing a plan to collect information and data for a comprehensive and broad understanding of all company operations. This stage of the DMAIC model focuses on how to measure internal processes, and requires understanding the causal relationship between process performance and customer value. It is also necessary to identify and implement procedures for confirming facts, collecting correct data, observations, and careful listening (Karout, 2015: 10). (Sharma et al., 2021: 5) emphasized the special importance of this stage as it represents the reference point for the project, as by identifying the metrics, it becomes possible to measure progress and set goals.(While al., 2020: 338) and described the measurement stage in the DMAIC model as consisting of creating reliable and applicable metrics to help monitor the main process characteristics, the range of parameters taken into account, and their performance to understand their progress towards the goals set in the definition stage.

3. Analysis

During this stage, the data obtained from the previous stage are analyzed, to identify and know the differences between the actual and targeted performance in order to find trends or differences that indicate or support the factors related to the causes of product or service defects and failures. (Sharma et al., 2021:5) The analysis stage is carried out in order to examine the state of the system, identify the causes of failure modes and as a means of obtaining an expert's view on the risks of failure modes. (Rifqi et al., 2021:65) confirm that the main objective of this stage is to analyze the results obtained in the previous stage in order

to address and highlight the root causes, which will allow for the development of optimal solutions. (Trimarjoko et al., 2020:36) described the analysis stage as the stage of determining the current situation and identifying the opportunity for improvement. By analyzing the factors causing the problem, improvement actions can be focused.

4.Improve

This stage aims to correct and modify current processes, to contribute to achieving the target, by developing the proposed solutions and choosing the most appropriate, implementing those solutions and knowing their suitability for the improvement stage, and identifying the possible causes of any deviations or defects that may appear that lead to the failure of the process and taking preventive measures and procedures that prevent their recurrence. (Trimarjoko et al., 2020:36) The improvement stage is the activities of selecting the best alternative measures, which analyze the event from the analysis stage by conducting a test of the action taken. During this stage, solutions must be developed to address the main causes that have already been identified during the analysis stage, and then these solutions are evaluated for the expected risks and the improvement is also evaluated after conducting a pilot test (Alejandrino et al., 2020: 1344). (Trimarjoko et al., 2020:36) The improvement stage is the activities of selecting the best alternative measures, which analyze the event from the analysis stage by conducting a test of the action taken.

5.Control

This stage ensures that the changes made in the improvement stage are continuous and sufficient, by verifying the quality of the improved processes, and continuously monitoring current and future processes to reduce deviations and the need to emphasize the need for feedback. The control stage focuses on creating and implementing control and response plans to sustain improvements, disseminating the results and methodology to the entire organization, and ensuring the creation of a new culture within the organization. In addition, operating standards and procedures will be documented and published in the control stage (Gupta, 2013:51). (Trimarjoko et al., 2020:36) referred to the control stage as the stage of monitoring the solution and standards used and ensuring that control is carried out at the cause of the problem, as well as obtaining support from management.

Waste Reduction3

3.1 The concept of Waste Reduction

International competition and customer demands have brought about radical changes in manufacturing. Organizations around the world, realizing the importance of being part of the global market, are looking for operational methods to increase their competitiveness through the use of innovative production systems. Traditional manufacturing models are being challenged and new manufacturing principles are being developed. Terms such as Waste-Free Manufacturing, World-Class Manufacturing, and Lean Manufacturing have emerged. Organizations have given increasing attention to delivering the products that customers need faster than their competitors and meeting or exceeding quality requirements. Human activities and changes in lifestyles and consumption patterns have generated vast amounts of

different types of waste (Oweis et al., 2005:622-625). (Womack & Jones 1996:306) described it as an activity that absorbs resources but does not create any value. Waste was often seen as a by-product, as waste generation was a necessary fact of economic development, and its treatment was often a matter of reacting to problems that arose individually in a situation-dependent manner. However, the processes that lead to waste reduction can be seen more proactively and systematically (Letcher & Vallero, 2019:15). (Gregson & Crang ,2010:4) described it as "those things that are controlled". (Moradi & Sormunen ,2023:622) referred to it as "any human activity that absorbs resources but does not create any value".

2.2 The dimensions of Waste Reduction

1. Surplus production

Any manufacturing of components before they are needed, which makes it difficult to detect defects and leads to increased lead times and inventory. When operations continue after they were supposed to stop, this leads to an increase in products, and the manufacture of products too early (Hicks, 2007:236). (Mohamed, 2013:30) emphasized that it is a product made without a specific customer or product development or process or manufacturing facility without any added value. (Sutherland & Bennett ,2007:4) see that delivering products before they are needed is overproduction, and for the supply chain, the most dangerous overproduction of demand information is what Toyota calls "created demand", which arises when a larger quantity is ordered than is required for the final use or ordered too early.

2.transport Excess

Material movement from one place to another (Carvalho et al., 2014:2). Any excessive movement and handling of materials of the product between operations, which can cause damage and deterioration of the quality of the product without adding any significant value to the customers. Or moving materials, parts or finished goods in or out of storage or between operations (Liker, 2003:44-45). (Domingo, 2015:4) sees it as the unnecessary movement of the worker due to the disorganized workplace and storage locations.(Mulyana et al., 2023:5) adds that it is the unnecessary movement of materials and insufficient planning, meaning the movement of materials such as (paper) and the repeated approvals of a very large number of email attachments, and the storage of required materials away from the point of use. (Martins et al., 2023:4)indicated that it is the excessive movement of people, information or items, which leads to unnecessary expenditure of capital, time and energy.

3.Time Waiting

Unbalanced workstations cause operators to waste time, because if a process step takes longer than the next, operators will either stand idly by waiting, or they will perform their tasks so quickly that it seems as if they have work to complete. Operators can also wait when a previous process step breaks down, there are quality issues, parts or information are missing, or a long-term change occurs (Krajewski & Malhotra, 2022:166). Any manufacturing system does not add value while resources are constantly depleting, in other words, if capacity remains unused, it is a loss (Balogh et al., 2020:219).

4.processing Excess

Using high-precision (expensive) equipment when simple machines are sufficient means overusing expensive capital assets. Investing in smaller, flexible equipment, properly maintained older machines, and combining process steps where appropriate reduces the waste associated with inadequate processing. That is, when a stage of a process does not add value to the product (Hassan 2013:30,). (Liker, 2003:44) sees it as taking unnecessary steps to process the process, and inefficient due to poor tool and product design, causing unnecessary movement and producing defects. (Balogh et al.,2020:219) emphasized that it is all completed work that the customer does not want to pay for, but is necessary for some reason, for example the price will be the same no matter how many times the product has to be inspected or taken away. (Kelendar 2020:917) referred to it as a tool or procedure that causes unnecessary operations and/or defects, i.e. when high-quality products are delivered at a higher cost than necessary due to the use of unnecessarily complex and inefficient tools, or bottlenecks that cause workstations to stop.

5. Unnecessary movement

People who walk or perform movements that do not add value to the products (Carvalho et al., 2014: 3). Or any unnecessary effort related to the work environment of bending, stretching, reaching, lifting and walking, as jobs with excessive movement must be redesigned. It was described by (Shingo ,1989:191-194) as an action or activity that does not add value to the product. And (Liker, 2003:44) that it is any wasted movement of employees while performing their work, such as searching for, reaching for or storing parts and tools. Any additional steps taken by employees and equipment to accommodate inefficient planning, defects, reprocessing and overproduction, as movement takes time and does not add any value to the product or service (Hicks, 2007: 237)

6. Reject

Quality defects result in rework, damage and added costs to the system in the form of lost energy, rescheduling efforts, increased inspection, and loss of customer reputation. That is, producing defective parts or correcting, repairing, reworking and inspecting means wasting processing, time and effort (Liker, 2003:44). (Carvalho et al., 2014:3) adds that it means producing defective products, which leads to more associated costs such as material costs, labor costs, and machine costs. (Hicks 2007:237) pointed out that rejected production represents finished goods or services that do not conform to specifications or expectations, causing customer dissatisfaction, in other words, designing products and services that do not meet customer needs.(Hassan 2013:30) emphasizes that they are errors that occur during the process, which require rework or damage to the product.

7.use Insufficient potential of employee

Human capital is one of the main resources of the company to achieve competitive advantage and create wealth (Kawan, 2017: 530). The company's failure to learn from the knowledge and creativity of its employees and benefit from them hinders its efforts to eliminate the damaged. "Intelligence, skills, and experiences" represent the cornerstone of employee

capabilities that give the company its distinctive character, and that these elements are capable of learning, change, and innovation that ensures the company's survival in the long term (Baron & Armstrong, 2007: 8). (Koskela et al., 2013: 6) believes that it is the failure to use the talents, skills, and abilities of individuals, and the waste of new ideas. That is, wasting time, improvements, and learning opportunities by not engaging with employees or listening to them (Kelendar 2020: 917).

3.The practical side of the study

a. Descriptive analysis of sample responses

First: describing and diagnosing the dimensions of DMAIC model

1)Describe The first dimension: Definition

It is noted from the results of Table (1) that the general average of the definition dimension reached (4.56), with a high relative importance of (91.11%), and the paragraphs were consistent with the level of answers with a standard deviation of (0.50), and with acceptable homogeneity with a coefficient of variation of (11.17%), and this shows the interest of employees in the upper and middle managements at Zain Telecommunications Company in giving high priority to this dimension. As for the paragraph level, paragraph (3), which indicates (the company's management realizes the importance of arranging customers' priorities, needs and requirements), was the most interested and agreed upon, as the level of agreement on it was with an arithmetic mean of (4.61), a standard deviation of (0.53), a coefficient of variation of (11.58%), and a relative importance of (92.24%). The paragraph with the least agreement was paragraph (2) (the company management is keen to clearly identify stakeholders), as it obtained an arithmetic mean of (4.46), a higher standard deviation of (0.66), a coefficient of variation of (15.07%), and a relative importance of (89.11%). From the above, the results above show that the interest in this dimension came as a result of the company management's interest in focusing greatly on understanding the needs and requirements of customers, which reflects an effective strategy towards improving the customer experience.

2) Describe the Variety of Measurement

The results indicate that the arithmetic mean of this dimension reached a value of (4.47) with a high relative importance of (89.31%), a standard deviation of (0.55), and a coefficient of variation of (12.43%). This element was positively affected by paragraph (2) (the company's management makes great efforts to organize its resources towards achieving the highest returns at the lowest costs) with the highest level of relative importance, as it reached (91.04%) and an arithmetic mean of ((4.55) and a standard deviation of (0.57) and a coefficient of variation of (12.67 (%), while the lowest response at the level of relative importance was paragraph (5) (the company's management evaluates the performance of employees based on the ability to respond to work requirements) as it reached (87.50%) with an arithmetic mean of (4.38) and a standard deviation of (0.72) and a coefficient of variation of (16.51%). From the above, the results indicate that the company's management believes in the importance of organizational and material resources in achieving success by organizing and evaluating its resources in order to obtain the highest returns and follow up on research

trends. And development in competing companies, reflecting a good understanding of market needs. In return, management should consider improving methods of evaluating employee performance, as there seems to be a disparity in opinions, which may affect the overall performance of the company.

3) Describe the Variety Analysis

The results indicate that the general average for this dimension was (4.46), a standard deviation coefficient of (0.61), a coefficient of variation (13.74%), and a relative importance of (89.29%), and that the most important and agreed upon paragraph is paragraph (1) (the company's management emphasizes the need to analyze the internal and external factors that lead to the failure of the services provided by it) with a relative importance of (89.58%) and an arithmetic mean of (4.48), a standard deviation of (0.63) and a coefficient of variation (14.29 (%), and the lowest paragraph is paragraph (3) (the company's management monitors the causes of failure in the current process), with a relative importance of (89.53%) and an arithmetic mean and standard deviation of (4.48), (0.71) respectively and a coefficient of variation (16.13 (%). From the above, the results indicate that the high level of interest in this dimension came due to the company's management's ability to analyze the factors affecting the failure of services, which reflects its awareness of the importance of improving methods for monitoring the causes of failure. Working on developing and providing new services to meet the needs and desires of customers according to market studies and requirements.

4) **Describe the Variety Improvement**

The results in Table (1) indicate that the overall average of the improvement dimension was (4.49), and the standard deviation coefficient was (0.63), and the coefficient of variation was (14.28%), and the relative importance was (89.74%). This shows the interest of employees in the upper and middle managements at Zain Telecommunications Company in giving high priority to this dimension. As for the paragraph with the most interest and agreement in forming this dimension, paragraph (2) (the company's management is keen to develop emergency strategies in response to changes that may occur in the market movement and its requirements), as it obtained an arithmetic average (4.55), and a standard deviation (0.66), and this indicates the existence of good consensus among the opinions of employees, as most of them agree on the importance of these strategies, and the coefficient of variation was (14.72%), and this indicates relative stability in opinions, which means moderate variation. This paragraph also obtained a relative importance of (91.09%), which indicates the management's awareness of the importance of adapting to market changes. The paragraph with the least agreement was paragraph (3) (the company's management works on developing and continuously improving its services in response to changes in customers' tastes and desires), as it obtained an arithmetic mean of (4.46), a higher standard deviation of (0.77), and a coefficient of variation of (17.38%), which indicates a noticeable difference in opinions, reflecting a complete lack of agreement. It also obtained a relative importance of (89.17%). From the above, the results indicate that Zain Telecommunications Company focuses greatly on developing emergency strategies to confront changes in the market, which reflects a deep understanding of market needs and customer trends.

5) Describe the Variety Control

The results of Table (1) indicate that the general average of the control dimension was (4.46), and the paragraphs were consistent with the answers with a standard deviation of (0.63), and had acceptable homogeneity with a coefficient of variation of (14.32%), and a relative importance of (89.27%). Perhaps the importance of this dimension is due to the paragraph that contributed the most to forming this dimension, paragraph (1) (The company's management has a work team with distinguished knowledge of continuous control to ensure the continuity of improvements), as it obtained an arithmetic average of (4.52), and a standard deviation of (0.67), and this indicates good agreement among the opinions of the employees, as most of them agree on the importance of this control to ensure continuous improvement, and with a coefficient of variation of (14.89%), and this indicates relative stability in opinions, which means moderate variation, and this paragraph obtained a relative importance of (90.36%), which indicates the management's awareness of the importance of having a distinguished work team. The least positive paragraph in forming this dimension is paragraph (3) (the company's management works to benefit from feedback to complete the continuous improvement process), as it obtained an arithmetic mean of (4.32), a higher standard deviation of (0.83), and a coefficient of variation of (19.46%). From the above, the results indicate that the company's management is distinguished by its ability to seize opportunities, as it works to identify, distinguish and seize opportunities according to proactive plans by monitoring market movements, and enhancing its efforts in using feedback as a tool to improve performance.

Table (1) Summary of the outputs of the statistical description of the independent variable (DMAIC model)

	Dimensions	Men	Direction of answer	Answer level	S.D	C.V	Relative importance%	Availability level	Order of importance
1	**Definition**	**4.56**	I totally agree	Very high	**0.50**	**11.17**	**91.11**	**exceptional**	**1**
2	**Measurement**	**4.47**	I totally agree	Very high	**0.55**	**12.43**	**89.31**	**exceptional**	**2**
3	**Analysis**	**4.46**	I totally agree	Very high	**0.61**	**13.74**	**89.29**	**exceptional**	**3**
4	**Improvement**	**4.49**	I totally agree	Very high	**0.63**	**14.28**	**89.74**	**exceptional**	**4**
5	**Control**	**4.46**	I totally agree	Very high	**0.63**	**14.32**	**89.27**	**exceptional**	**5**
DMAIC Model Variable Rate									
4.49								**Men**	
0.52						**S.D**			
11.77				**C.V**					
89.74		**Relative importance**							

Source: Prepared by the researcher based on the results SPSS.V.29.

Second: Describing and diagnosing the dimensions of Waste Reduction

This paragraph shows the statistical description of the Waste Reduction variable through interpreting and analyzing the results based on the arithmetic mean, standard deviation, coefficient of variation, and relative importance. In order to determine the order of

importance, the order of the coefficient of variation for each paragraph and dimension belonging to this variable was relied upon as follows:

1) Description of Surplus production

The results of Table (2) indicate that the overall average of the overproduction dimension was (3.33), and the level of consistency in the answers was acceptable, which is reflected in the standard deviation value of (0.41), and the paragraphs were homogeneous based on the value of the coefficient of variation, which was (12.32%), and a relative importance value of (66.52%), which shows the interest of employees in the upper and middle managements at Zain Telecommunications Company towards this dimension, and that the most important and agreed upon paragraph for this dimension is (1) (the company's management avoids any unnecessary procedure or process) with an arithmetic mean of (3.35), a standard deviation of (0.48), which indicates good agreement between the opinions of employees, and a coefficient of variation of (14.51%), which indicates relative stability in opinions, which means that most employees agree on the importance of avoiding unnecessary procedures, and this paragraph obtained a relative importance value of (66.94%). From the above, the results indicate that Zain Telecommunications Company gives importance to avoiding unnecessary procedures, which reflects the management's commitment to work efficiency and improving performance. However, the low rate in the second paragraph shows the need to improve strategies to reduce redundant administrative procedures, which may contribute to enhancing the overall effectiveness and efficiency of work.

2) Description of transport Excess

The results showed that the general average for this dimension was (3.31), and the results of the standard deviation and the coefficient of variation indicated that there was harmony and homogeneity in the answers related to this dimension, as it recorded a reading of (0.43), (13.18%), respectively, with a relative importance of (66.25%). This element had a positive impact on paragraph (3) (the company reduces unproductive and unreliable communications in its data transfer) as it obtained an arithmetic average of (3.33), with a standard deviation of (0.47), and this indicates a good agreement between the opinions of the employees, as the variance in opinions is not large, and the coefficient of variation is (14.39%), and a relative importance of (66.53%). While paragraph (1) (the company avoids unnecessary handling of materials between operations) came in last place with an arithmetic mean of (3.41), a standard deviation of (0.57), and a coefficient of variation of (17.02), and it also obtained a relative importance of (68.16%). The results show that this dimension received a good percentage of interest, as Zain Telecom Company attaches importance to reducing unproductive communications, which reflects its commitment to improving operational efficiency and reducing waste.

3) Description of time Waiting

From following the results in Table (2), it is clear that the general average for the waiting time dimension reached (3.30), and the paragraphs were consistent with the answers with a standard deviation of (0.43), and had acceptable homogeneity with a coefficient of variation

of (13.24%), with a relative importance of (65.92%). As for the paragraph that received the most interest and agreement in forming this dimension, paragraph (3) (the company reduces waiting times to the lowest possible level with regard to approving new contracts), as it obtained an arithmetic average of (3.37), with a standard deviation of (0.49), and a coefficient of variation of (14.61%), and this indicates a relative stability in opinions, which means that most employees agree on the importance of reducing waiting times, with a relative importance of (67.35%). While paragraph (2) (the company seeks speed in matters of planning for production and operations with the aim of avoiding or reducing poor planning therein) came in last place with an arithmetic mean of (3.24), a standard deviation of (0.52), a coefficient of variation of (16.24%), and a relative importance of (64.90%). The results show that this dimension did not receive the necessary level of importance compared to the other dimensions, but the company's management gives priority to reducing waiting times for approvals, which reflects its efforts to improve the customer experience and operational efficiency.

4) Description of processing Excess

The results of Table (2) show that the general average of the over-processing dimension was (3.46), and the level of consistency in the answers was acceptable, which is reflected in the standard deviation value of (0.42). The paragraphs were also homogeneous based on the coefficient of variation percentage, which was (12.22%), and with a relative importance of (69.11%). Perhaps the importance of this dimension is due to the second paragraph (2), which indicates (the company's management avoids complexity in designing its products, which requires a large amount of unnecessary processing) with an arithmetic mean of (3.49) and a standard deviation of (0.51). This indicates good agreement between the opinions of employees, as the variance in opinions is not large, and with a coefficient of variation of (14.62%), which indicates relative stability in opinions. This paragraph also obtained a relative importance of (69.80%). While paragraph (1) (the company avoids using technological equipment that does not have the ability to process its various operations) came in last place, as it obtained an arithmetic mean of (3.41) and a standard deviation of (0.51). This indicates a good agreement between the opinions of employees, as the variance in opinions is not large, and with a coefficient of variation of (14.62%). This indicates a relative stability in opinions. This paragraph also obtained a relative importance of (69.80%). Standard (0.50), with a coefficient of variation (14.72%), and relative importance (68.16%). From the above, the results indicate that Zain Telecommunications Company attaches great importance to avoiding complexity in designing its products, which reflects the management's commitment to providing easy-to-use and highly efficient products.

5) Description of Unnecessary movement

The results of Table (2) showed that the general average for this dimension was (3.35), and the results of the standard deviation and the coefficient of variation indicated that there was harmony and homogeneity in the answers related to this dimension, as they recorded a reading of (0.43), (12.87%), respectively, with a relative importance of (67.08%). This dimension was positively affected by paragraph (2), which refers to (the company providing

information in appropriate places so that employees can easily obtain it without having to wander around the company's corridors), as it obtained an arithmetic average of (3.39), a standard deviation of (0.49), and a coefficient of variation of (14.68%), which indicates relative stability in opinions, which means that most employees agree on the importance of easy access to information. This paragraph also obtained a relative importance of (67.76%), which indicates the management's awareness of the importance of providing information in an organized manner. The paragraph with the least agreement was paragraph (3) (the company provides a good work environment to reduce excessive movements regardless of their size and type) with an arithmetic mean of (3.33), a standard deviation of (0.55), and a coefficient of variation of (16.85%). This paragraph also received a relative importance of (66.53%). From the above, the results indicate that Zain Telecommunications Company attaches great importance to providing information in appropriate places, which makes it easy for employees to access it and enhances effectiveness at work.

6) Description of Reject

It is noted that the general average of the rejected production dimension reached (3.28), and the paragraphs were consistent with the answers with a standard deviation of (0.55), and had acceptable homogeneity with a coefficient of variation of (16.93%), with a relative importance of (65.58%), and the paragraph that contributed the most to forming this dimension was paragraph (2) which indicates (the company works to correct errors in its products in a timely manner and without delay), as it obtained an arithmetic average of (3.33), a standard deviation of (0.41), and a coefficient of variation of (12.31%), and this indicates relative stability in opinions, which means that most workers agree on the importance of immediate correction of errors. This paragraph also received a relative importance of (66.53%). While paragraph (3) (the company avoids providing products that waste energy and do not add value to the customer) came in last place, as it received an arithmetic mean of (3.33), a standard deviation of (0.52), and a coefficient of variation of (15.66). This paragraph also received a relative importance of (66.53%). From the above, the results indicate that Zain Telecommunications Company attaches great importance to correcting errors in its products quickly, which reflects the management’s commitment to quality and customer satisfaction.

7) Description of use Insufficient potential of employee

The results in Table (2) show that the general average for this dimension was (3.29), and the results of the standard deviation and the coefficient of variation indicated that there is harmony and homogeneity in the answers related to this dimension, as it recorded a reading of (0.44), (13.41%), with a relative importance of (65.72%), and that the most important paragraph and agreement is paragraph (2) which indicates (the company adopts accurate standards to identify its efficient employees) with an arithmetic mean (3.29), and a standard deviation (0.50), which indicates good agreement between the opinions of employees, and a coefficient of variation (15.37%), which means that most employees agree on the importance of setting accurate standards for evaluating efficiency. This paragraph also received a relative importance of (65.71%), which indicates the management's awareness of the importance of

evaluating performance accurately. While paragraph (1) (the company seeks to optimally invest in the capabilities of its employees) came in last place as it received an arithmetic mean of (3.33), which indicates that it is considered less important compared to the second paragraph. With a standard deviation of (0.62) and a coefficient of variation of (18.62%), this paragraph also obtained a relative importance reading of (66.53%). From the above, the results indicate that Zain Telecommunications Company attaches great importance to setting precise standards for discovering competencies among its employees, which helps in improving overall performance.

Table (2) Summary of the outputs of the statistical description of the dependent variable Waste reduction)(

	Dimensions	Men	Direction of answer	Answer level	S.D	C.V	Relative importance%	Availability level	Order of importance
1	**Surplus production**	**3.33**	neutral	Moderate	**0.41**	**12.32**	**66.52**	**Medium**	**2**
2	**transport Excess**	**3.31**	neutral	Moderate	**0.43**	**13.18**	**66.25**	**Medium**	**4**
3	**time Waiting**	**3.30**	neutral	Moderate	**0.43**	**13.24**	**65.92**	**Medium**	**5**
4	**processing Excess**	**3.46**	**I agree**	**High**	**0.42**	**12.22**	**69.11**	**good**	**1**
5	**Unnecessary movement**	**3.35**	neutral	Moderate	**0.43**	**12.87**	**67.08**	**Medium**	**3**
6	**Reject**	**3.28**	neutral	Moderate	**0.55**	**16.93**	**65.58**	**Medium**	**7**
7	**use Insufficient potential of employee**	**3.29**	neutral	Moderate	**0.44**	**13.41**	**65.72**	**Medium**	**6**
Variable waste Reduction Rate									
3.33								**Men**	
0.38						**S.D**			
11.62				**C.V**					
66.61		**Relative importance**							

Source: Prepared by the researcher based on the results SPSS.V.29.

b.Impact relationship analysis

The significance of the effect is determined by relying on the Calculated (F) value and comparing it to its tabulated value, in addition to the significance level (P), which must be smaller than the permissible error of (0.05), as follows:

the hypothesis: There is a statistically significant impact relationship between the DMAIC model and its dimensions in reducing damage in its dimensions. The results in Table (3) and Figure (2) show that the (DMAIC) model affects the reduction of damage, as the calculated (F) value of (795.744) was greater than its tabular value under a significance level of (0.05), and that changing the (DMAIC) model by one unit leads to a change in the reduction of damage, which achieved a standard weight of (0.626) and a standard error rate equal to (0.044), and a critical value of (14.227), and the reduction of damage contributed to explaining (0.676) of the amount of variance in the reduction of damage, while the remaining value is due to factors not included in the study, which means that applying the (DMAIC) model is one of the techniques used by companies to reduce damage and improve the quality

of their products and services, which requires effective mechanisms such as "reducing preparation and delivery time and re-engineering its operations" to support the capabilities of the company's employees for growth, development and innovation. The results presented above demonstrate the validity of the eighth main hypothesis in general.

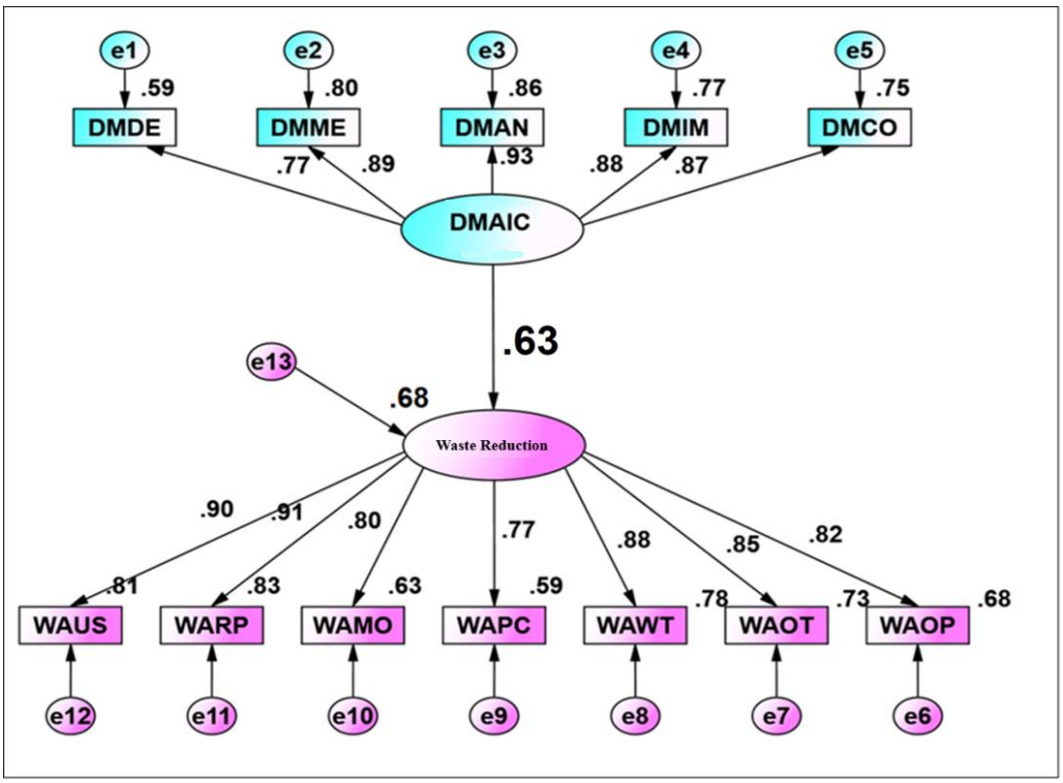

Figure (2) The structural model of the impact of the DMAIC model with its dimensions on reducing damage with its dimensions

Table (3) shows the results of the analysis of the impact of the DMAIC model with its dimensions in reducing damage with its dimensions.

Path			Standard weight	Standard error	critical value	Interpretation factor	F	probability
DMAIC	--->	Waste Reduction	**0.626**	**0.044**	**14.227**	**0.676**	**795.744**	0.001

4. Conclusions

1.The results confirmed that the analysis dimension receives a level of interest from the study sample, and the high level of interest in this dimension came as a result of the company having the necessary capabilities to analyze the factors affecting the delay and failure of services, according to the quality standards that the company seeks to achieve and make them among its priorities and future plans.

2.The analysis results indicated that the study sample agreed on the importance of the dimension of over-processing, as the company works to avoid complexity in designing its products, which reflects the management's commitment to providing easy-to-use products with high efficiency. While the study revealed a low level in the dimension (insufficient use

of employee capabilities), which means that the company's management needs to enhance employee engagement strategies, as improving this aspect can contribute to enhancing innovation and benefiting from them.

3. The results show a significant effect between the (DMAIC) model and reducing waste, indicating that it is one of the techniques used by companies to reduce waste and improve the quality of their products and services, which requires effective work mechanisms such as "reducing preparation and delivery time and re-engineering its operations" to support the creativity process, which may contribute to improving the performance and competitiveness of the company under study.

4. The results show that there is a significant and positive correlation between the DMAIC model and waste reduction. This means that applying the DMAIC model contributes significantly to reducing the waste rate, which reflects its effectiveness in improving efficiency and reducing waste in production processes. The above results show that the second main hypothesis is generally achieved.

5.The results indicate that the company's management is distinguished by its ability to seize opportunities, and this demonstrates the effective role of the control dimension, as it works to identify and distinguish opportunities and seize them according to proactive plans by monitoring market movements, and enhancing the company's efforts to use feedback as a tool to improve performance

5.Recommendations

1.The company's management needs to apply the (DMAIC) model as a strategic tool to improve the quality of services and work to raise its level among individuals by holding seminars, courses and workshops, as it is clear that using this model not only contributes to raising the level of quality of the service provided, but also plays a vital role in reducing the percentage of damage, which enhances efficiency and reduces waste in production processes.

2.The company must intensify efforts to reduce unnecessary handling operations, which requires developing clear mechanisms to simplify internal communications, which reduces waste and enhances operational efficiency in general.

3.The low rate in the dimension of insufficient use of employee capabilities shows the need to deepen awareness among employees to work in a team spirit and provide them with material and moral support and encourage them to provide new ideas and better performance of the required tasks efficiently and effectively.

4.Improving the flow of information between different teams to enhance product quality, by creating an effective system for exchanging information about errors and updates, through which defects can be reduced and the effectiveness of operational processes can be increased.

5. Improving the work environment to reduce excessive movements and redesigning office spaces to achieve easy access to information and tools, which contributes to increasing productivity, maximizing revenues and increasing profits.

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