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EVALUATING THE REALITY OF MANUFACTURING STRATEGIES GUIDE / EXPLORATORY STUDY OF THE OPINIONS OF A SAMPLE OF ADMINISTRATIVE LEADERS WORKING IN THE SAMARRA PHARMACEUTICAL FACTORY

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A B S T R A C T	K E Y W O R D S
The research aims to evaluate the reality of applying pilot manufacturing strategies in the Samarra Pharmaceutical Factory, as the descriptive analytical approach was relied upon in studying the problem of the study. The two researchers measured the laboratory's application of the six pilot manufacturing strategies, which are (comprehensive quality management, comprehensive productive maintenance, continuous improvement, and production in... Limited time, cellular manufacturing, rapid change) through a questionnaire form through which data was collected from the researched sample consisting of (60) individuals from various administrative levels. The questionnaire form was distributed to the members of the researched sample and was retrieved from (44) forms valid for statistical analysis. With a percentage of (73.3) In light of this, the study reached a set of conclusions, perhaps the most prominent of which is that the management of the Samarra Pharmaceuticals Factory has a vision of all guided manufacturing strategies, especially the comprehensive productive maintenance strategy, but it needs to show more attention to the comprehensive quality management strategy. In light of the research conclusions, the researchers presented a set of Perhaps the most prominent recommendations are for the laboratory management to maintain the application of the six guiding manufacturing strategies (total quality management, comprehensive productive maintenance, continuous improvement, on-time production, cellular manufacturing, rapid change) in its production processes to	

provide products and services that meet the needs of patients, especially at this time when The Iraqi environment witnesses a scarcity of laboratories that produce medical products. In addition, investing in this strategy is one of the means that increases the efficiency of production processes and reduces waste and loss of resources, because these strategies are compatible with each other and do not contradict each other when applied by administrative leaders.	

Introduction

The rapid changes in the business environment resulting from various factors such as economic and technological factors and competition between organizations have led to an increase in the efforts of organizations, especially productive ones, to adopt various mechanisms that enable them to confront various environmental challenges to ensure continued competition and survival in the labor market. As a result, productive organizations seek to acquire competitive advantages and develop them in line with the actual needs of consumers, because these advantages are the characteristic that enables organizations to achieve superiority over competitors in the work environment, which has led to an attempt by productive organizations to adopt new systems, manufacturing methods, and strategic approaches that reduce... Waste, production cycle time, and cost reduction, which enhances the sustainability of these advantages. Perhaps one of these systems is the guided manufacturing system, which refers to the methods and tools that organizations adopt to ensure that demand is met quickly and without waste. This system relies on a set of strategies to identify forms of waste and work to eliminate them. These strategies (total quality management, total quality philosophy, comprehensive productive maintenance, continuous improvement, just-in-time production, cellular manufacturing). In light of this, this research gains its importance from the importance of these strategies, which production organizations rely on in trying to enhance competitive advantages, and thus aims The current study aims to evaluate the reality of guided manufacturing strategies in the Kirkuk Cement Factory and present a number of conclusions and recommendations in light of the results it reached. In order to achieve this, the study was divided into four axes. The first axis dealt with the methodological framework, while the second axis dealt with the theoretical framework, and the third axis was devoted to the practical aspect. For the research, the last topic was devoted to the most important conclusions and recommendations that were reached

The first axis

Methodological framework

The methodological framework of the research addresses the research problem, its importance and objectives, as well as its hypothetical plan and hypotheses emerging from it, and a statement of the research methodology and data collection methods, as follows:

First: the research problem

Given the intensity of competition in the work environment and the efforts of productive organizations to meet the needs and desires of their customers on time and at a lower production cost to increase profits and enhance their competitive position, applying productive strategies that ensure the organizations' smooth work, accuracy in the delivery date, and reducing waste and loss, which increases the financial burdens borne by the organizations, takes It is of great importance in our current era as a result of the multiple challenges it faces, and among these strategies that may be relied upon are rational manufacturing strategies that may contribute to reducing waste and costs incurred by organizations. Accordingly, the research problem emerges in two questions:

1. What is the reality of applying rational manufacturing strategies in the researched organization
2. What is the level of importance of each guided manufacturing strategy in the researched organization?
2. Is there a significant correlation between rational manufacturing strategies in the researched organization?

Second: The importance of research

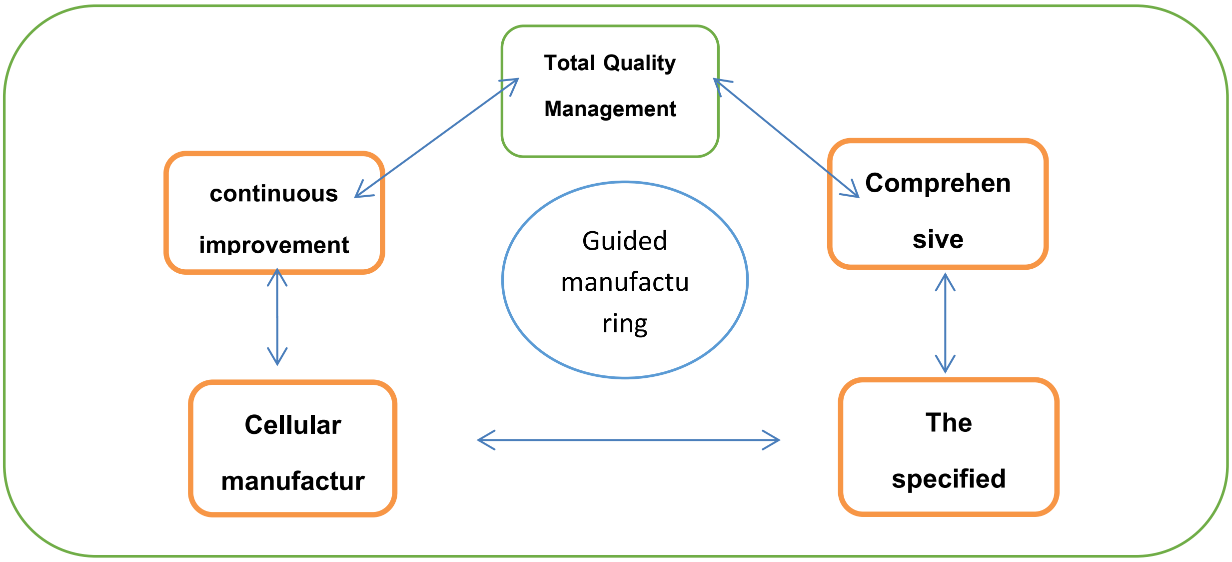
The importance of the current research lies in providing the researched organization with a study that evaluates its reality in applying guided manufacturing strategies in its production processes, as well as providing a set of recommendations in light of the results it reaches based on scientific and methodological foundations. Moreover, this research opens horizons for carrying out other studies on the reality of Applying guided manufacturing strategies in other industrial organizations

Third: Research objectives

In light of the above problem and the importance of the research, the objectives of the research lie in the following

1. Identify the reality of applying rational manufacturing strategies in the researched organization
2. Identify the relative importance of each of the guiding industry strategies in the researched organization
3. Identifying the existence of a significant correlation in the researched organization
4. Providing a set of recommendations to the researched organization based on the results reached

Fourth: Hypothetical research plan



Fifth: Research hypotheses

Based on the above research problem and objectives, the researchers assume the following two hypotheses

The first hypothesis: The researched organization applies guided manufacturing strategies (total quality management, comprehensive productive maintenance, continuous improvement, just-in-time production, cellular manufacturing) in its operations.

The second hypothesis: There is a significant correlation between rational manufacturing strategies in the researched organization

Sixth: Research methodology

The researchers relied on the descriptive analytical method in their research, both theoretical and practical, because it is the most appropriate in achieving the purpose of the current study because it presents the theoretical material in a scientific way that achieves the research's objectives, in addition to benefiting from it in analyzing the questionnaire forms distributed to the members of the study sample that it adopted in order to reach the results.

Seventh: Description and diagnosis of the study population and sample

Firstly. Research population and sample

The field of research represented the Iraqi industrial sector, while the research community included all administrative leaders working in the Samarra Pharmaceutical Factory, while the chosen purposive sample was limited to the number of questionnaires returned from managers who had an interest in manufacturing strategies, as 60 questionnaires were distributed, of which 44 forms were recovered with a recovery rate. (73.3%), and Table (1) shows the number of questionnaires distributed and returned.

Table (1): Questionnaire forms distributed and returned

Percentage of returned forms	Recovered forms suitable for analysis	Distributed forms	Statement
%73.3	44	60	The research sample

Secondly .Measuring variables

A questionnaire form was formulated to measure the only variable for the research, which is the guided manufacturing strategies, which includes six strategies (total quality management , comprehensive productive maintenance, continuous improvement, on-time production ,cellular manufacturing, and rapid change) that represent the dimensions of this variable, and it was measured through 24 statements distributed by 4 statements for each of these dimensions. The questionnaire form included in a special section the personal information of the sample members that express their demographic characteristics and three pieces of information: (age, years of service, administrative position), and Table (2) shows the structure of the questionnaire. Questionnaire

Table (2): Details of the questionnaire form information

Sequence	the number	code	Dimensions	Statement	Interviewer
		A		**the age**	**the hub First : information Demographic**
		Y		**Years the service**	
		J		**Position Administrative**	
4-1	4	xx1	**First : management the quality Overall**	**Strategies Manufacturing leader**	**the hub Second : variable search**
8-5	4	xx2	**Second : Maintenance The producer Overall**		
12-9	4	xx3	**Third : improvement Continuous**		
16-13	4	xx4	**Fourth : Production in the time Specified**		
20-17	4	xx5	**Fifth : Manufacturing Cellular**		
24-21	4	xx6	**Sixth : Change The fast one**		
24-1	24	X			**Total**

Source: The table was prepared by the researchers.

A five-point Likert scale was used to transform qualitative data into quantitative ones. The value 1 was given to the answer) strongly disagree), the value 2 was given to the answer (disagree), the value 3was given to the answer (neutral), the value 4 was given to the answer) agreed), and the value 5 was given to the answer (strongly agree. .(

Third. Demographic information for the research sample

The research included three personal information that determine the demographic characteristics of the sample members, as shown in Table (3.(

Table (3): Description of the sample members according to demographic characteristics

The ratio%	the number	Category	
18.2	8	From 30 years So less	the age
29.5	13	From 31-40 years old	
31.8	14	From 41-50 years old	
20.5	9	From 51 years old And more	
40.9	18	From 1-10 years	Years of service
27.3	12	From 11-20 years	
22.7	10	From 21-30 years old	
9.1	4	From 31 years And more	
29.5	13	boss lonliness	Administrative position
43.2	19	boss Section	
15.9	7	boss to divide	
4.5	2	Associate boss	
6.8	3	boss	

Source: The table was prepared by the researchers according to the SPSS program .

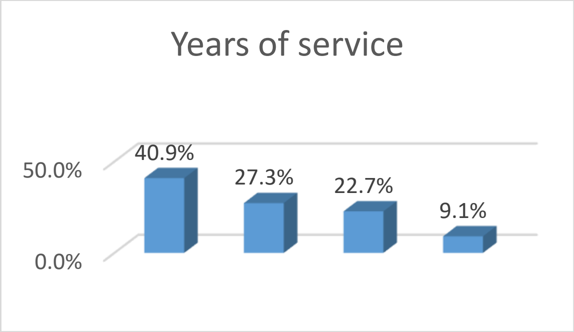
It is noted from Table (3) that:

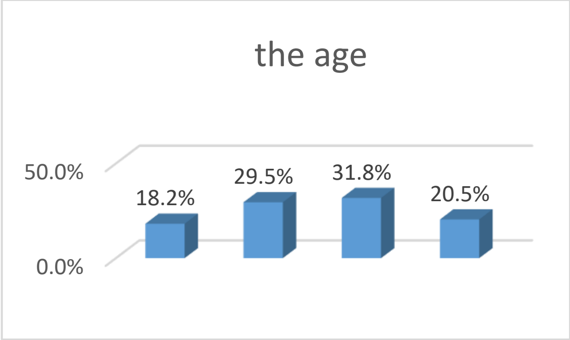
.1**In terms of age :**The number of individuals reached...

.2**In terms of years** of **service**.... **:**

.3**In terms of administrative position**........ **:**

Figure (2) shows the distribution of sample members according to demographic characteristics





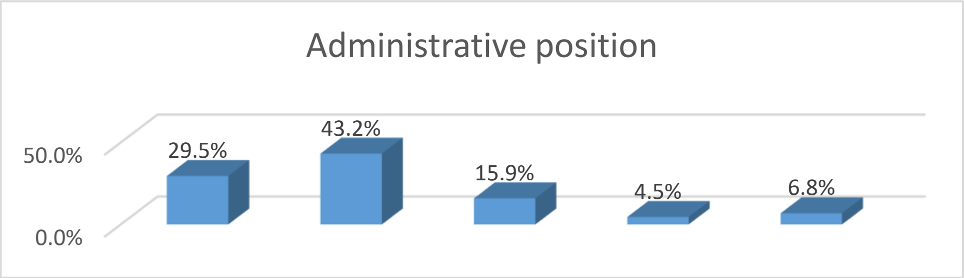


Figure (2): Distribution of sample members according to demographic characteristics

Source: The figure was prepared by the researchers

The second axis

Theoretical framework

First: An overview of the concept of rational manufacturing and its strategies:

Before the two researchers delve into the context of the concept of rational manufacturing strategies, it is necessary to give an overview of this concept, as John Krafcik, a researcher in the International Motor Show (IMTV) program, is the first to invent the term rational manufacturing and called it rational because it uses the least amount of everything, which reduces... Of the manpower needed for production, reducing inventory by half, reducing maintenance, preparation and preparation times, as well as reducing or eliminating all types of waste and losses (Al-Mashharawi, 2015: 43)

(Shaheen, 2018: 14) defined rational manufacturing as the philosophy of rationalizing the use of resources, eliminating all forms of waste and loss, and providing customers with the best possible value by maintaining operational improvements derived from rational manufacturing policy, continuous development in operational performance, and focusing on a culture of quality in all operations.

In light of this, Stevenson (2021: 538) believes that rational manufacturing depends on demand, which means that materials (primary, semi-finished, raw) are withdrawn directly to match the demand instead of sending them to the production process without any match with the demand, which reduces preparation and handling costs. Reducing inventory to a minimum, standardizing and simplifying necessary activities, as well as reducing disturbances faced by the production process, reducing space needs, and enhancing the ability to discover problems. Many economic feasibility studies have confirmed that bringing machines and workers closer together in the workplace increases opportunities for socialization, communication, and cooperation.

Accordingly, rational manufacturing depends on a set of strategies, which can be generally defined by (Al-Bahar, 2020: 31) as a set of tools and strategies that work to achieve a smooth flow of resources through the various stages of production, which achieves high flexibility in operations and eliminates all types of waste. damage, losses, and the exclusion of unnecessary activities, which improves operational operations in general, while Al-Khadrawi (2021:369) defines it as

Strategies that work to detect all types, classifications and forms of waste, damage and losses and work to eliminate or eliminate them. In this regard, it must be noted that there are many guiding manufacturing strategies, including (total quality management, total quality philosophy, cellular manufacturing, and specific time). (Continuous improvement). Based on the above, these strategies can be defined in the field under study as the totality of the activities and operations carried out by the factory that enable it to introduce improvements to the stages of production processes and reduce all forms of waste and loss of resources, which reduces financial burdens and speeds up the meeting of customer requirements.

Third: Objectives of guided manufacturing strategies:

The main goal of rational manufacturing is to form an industrial organization capable of producing products that meet the desires of customers at the lowest possible cost and with the highest possible quality, while taking into account environmental aspects by relying on a set of strategies. Accordingly, these strategies have a set of goals that they try to achieve, which were mentioned by many researchers, such as: (Al-Mashharawi, 43:2015) (Schroeder&Goldstein,2016:466) (Al-Khadrawi, 367:2021) (Al-Asadi, 2020:18) (Azaizia, 2019:591) (Elgool,etal,2020:20) (Safia, 2019:20) The following is its explanation:

1. Continuous development and improvement of the various stages of production and focus on flexibility in processes and equipment, which enables the organization to diversify its products in response to market requirements and trends.
2. Reducing all types of costs, such as transportation, storage, and spoilage costs, which increases the company’s industrial profits and increases rates of return.
3. Reducing and detecting waste by achieving an approach (zero defect, zero malfunction, zero accident)
4. Taking into account environmental aspects by providing environmentally friendly products that meet the desires and requirements of the modern customer, ensuring their loyalty and building long-term relationships with them.
5. Reducing the total production time, improving the performance of workers and raising their efficiency.
6. Accuracy in the dates of delivering products to customers or beneficiaries, as it depends on the withdrawal system, which gives the facility a competitive advantage.
7. Arranging machines, equipment, workers, and work spaces in a way that makes the flow of materials smooth between the different production units.

8. Paying attention to the human element as one of the basic elements in solving problems and continuous improvement.
9. Raising the level of workers in all psychological, skill, mental, social and physical aspects.
10. Reducing all types of inventory (in-progress inventory, finished materials inventory, raw materials inventory), considering that inventory is the cause of most problems in industrial companies.

Fourth, guided manufacturing strategies:
We have previously mentioned these strategies to enable the company to recognize the classifications and forms of waste and work to eliminate and eliminate them. Below is a brief explanation of each strategy:
1. Total quality management:
Researchers have many opinions regarding the concept of total quality management, and (Radwan 2013: 25) indicates that it is a system that includes integrated intellectual philosophies, statistical tools, and administrative processes to achieve customer and employee satisfaction alike, while it is defined by (Al-Jarjari, 2014: 265) Chahal, etal, 2017: 279) (Majoud, 2020: 73) It is an administrative philosophy that focuses on the following principles:
a. Top management support: The success of implementing the total quality management philosophy in the organization depends on the support and commitment of top management.
B. Worker participation: By giving workers more authority in their field of work and urging them to participate actively in solving problems related to quality, it gives employees motivation to provide the best in their field of work and get rid of unnecessary activities or that do not add value to the company.
C. Continuous improvement: improvement occurs gradually (step by step).
Dr.. Focus on the customer: One of the most important considerations that must be taken when producing a product or providing a service is how the customer judges the good or bad good or service.
In light of this, it can be defined procedurally as the administrative process through which the factory management seeks to develop its production processes to satisfy the customer's needs and desires without affecting the job satisfaction of its employees.
2. Comprehensive productive maintenance: Many researchers have dealt with the concept of comprehensive productive maintenance from different points of view. (Al-Obaidi, 2013: 114) sees it as a group of workers who meet weekly according to a pre-determined schedule to discuss the problems facing the progress of the production process and try to find the best solutions to them and present them to them. Higher Management
While (Saleh and Al-Dawai, 2018: 394) defined it as a strategy to improve the effectiveness of machines, equipment, and processes, and it includes all sectors, including manufacturing, planning, and maintenance, and works to eliminate malfunctions in machines and equipment through preventive maintenance by the operator, which leads to prolonging their life. equipment and reduce the interruptions facing the production process.
In this regard, (Al-Bahar, 2020: 64) believes that comprehensive productive maintenance achieves many benefits
- Reducing maintenance and production costs and improving the quality of the outputs of the production process.

- Ensuring continuity of production operations without interruptions.

Comprehensive productive maintenance aims to maintain the production system as a whole in good condition in order to avoid malfunctions and interruptions, maintain high quality, and avoid missing delivery dates. According to Stevenson (2021: 647), this maintenance is divided into two types:

The first: is preventive maintenance, which provides for reducing errors through a program of lubrication, cleaning, inspection, and replacement of worn-out parts.

The second: It is remedial maintenance, which deals with errors or malfunctions as soon as they occur

In light of this, comprehensive productive maintenance can be defined procedurally as the totality of the procedures undertaken by the factory to avoid interruptions in production processes, ensure the flow of work, avoid errors before they occur, and deal with them immediately if they occur.

3. Continuous improvement: Continuous improvement, or what is called (Kaizen) according to the Japanese language, is a management philosophy whose historical roots go back to Japan. Many industrial companies, such as Toyota and Mistiboshi, have relied on it for the purpose of reducing costs in production and achieving competitive advantages by making continuous and gradual improvements in The various customer activities that the production units go through, as well as eliminating waste, damage, and deletion of activities that do not add value or are unnecessary, which contribute to achieving the desired goals of the industrial company (Khanjar and Yaqoub, 2018: 38), while (Ismail, 2019: 721) defined it as the process Through which activities and processes related to providing a product or service are improved and developed and ensured that they are compatible with the needs, desires and requirements of customers, as well as reducing costs to a minimum without compromising quality, it is defined (Wael, 2020: 22) as the continuous improvement of machines, materials, procedures and individuals and that the basic idea of continuous improvement is It is improving operations through the participation of working individuals in developing ideas and suggestions in the company.

In light of the above, KRAJEWSKI (2020:168) believes that excess capacity or inventory hides the basic problems that occur in the processes that produce a product or service, as waste-free systems provide a mechanism for management to detect problems through regular reduction of inventory or energy levels, and it can be likened to Excess energy or storage on the surface of the sea. As for the problems that occur in operations, they are represented by rocks at the bottom of the sea. When the water surface is high, the boat passes with ease. However, if water levels are low, the boat will collide with rocks. Through lean systems, workers, engineers, technicians, and analysts will apply methods for continuous improvement. To demolish exposed rocks allowing a smooth flow of resources

In light of the above, continuous improvement can be defined procedurally as the philosophy that the factory relies on to reduce costs to the minimum possible by benefiting from the opinions of employees in developing and improving production processes.

4.The specified time:

Just-in-time (JIT) is one of the most common systems that includes the general elements of lean systems. According to Taiichi Ohno, one of the early pioneers of Toyota Corporation, the Just-in-time (JIT) philosophy is simple but powerful - eliminate waste by reducing excess capacity or inventory and eliminating unnecessary activities (KRAJEWSKI,2016:230).

He defined it (Mohamed, 2016: 19) as a method or philosophy of production based on reducing inventory and waiting time, as activities that do not add value to the organization, as the semi-manufactured parts and raw materials allocated for the production process are received in a timely manner, as well as the production units are delivered directly to the delivery centers, which results in This reduces storage costs, which include insurance, ventilation, lighting, and damage costs, as well as reducing the costs of handling materials and semi-manufactured parts, and ensuring that products are delivered to customers on time, which gives the company a competitive advantage (precedence of delivery), which ensures customer loyalty.

HEIZER, etal, 2020: 679)) A technology based on eliminating all types of waste by reducing inventory to a minimum and improving productivity. The production system works on time according to the withdrawal system by producing materials according to demand. When the company receives an order, it determines the materials needed to produce The order is sent directly to the work site to be converted into finished products that are delivered directly to customers. However, in the event that the materials needed for production do not reach the work site, the guided production system takes care of identifying the problem. This is the strong aspect of this system, as it focuses on solving problems, eliminating waste, and reducing inventory to minimum

Just-in-time manufacturing brings many benefits, the most important of which is Stevenson (2020: 613).

- Eliminate all types of waste
- Reducing costs due to its focus on reducing inventory and eliminating all types of waste
- Achieving high levels of quality motivated by customer focus
- High flexibility in operations, which increases the company’s ability to respond to market trends and requirements
- Improving productivity by eliminating unnecessary activities or that do not add value to the company

In light of the above, just-in-time manufacturing can be defined procedurally. The factory adopts a production philosophy that focuses on reducing all forms of product waste and delivering raw materials to delivery centers immediately upon receipt in order to quickly produce products and deliver them to customers at the time specified by the factory.

5. Cellular manufacturing: It is the physical arrangement of production facilities, facilities, machines, and equipment that produce the different parts of the product. This arrangement is in the shape of the letter U, which reduces time and movement and allows a smooth flow of the various production elements, which reduces waiting times, reduces inventory between operations, and makes better use of space. Improving production and flexibility (Ibrahim, 2019: 366). Cellular manufacturing achieves many benefits, the most important of which is improving productivity, reducing maintenance and operating costs, reducing in-process inventory costs, making better use of resources (machinery, equipment, and workers), achieving high levels of product quality, and reducing setup times. And numbers (Abdul Razzaq et al., 2021: 137)

Cellular manufacturing is one of the hybrid systems that operates in the form of work cells. The cell is an expression of a combination of machines, equipment and workers formed to produce a family of products. The cell is shaped like the letter (u) or (c) through which one piece or a group of parts (product families) flows to Production and there is a family relationship between the producing units. The individuals working in the cell are characterized by flexibility and high speed, and the cell’s outputs are easily changed by changing the number of machines and workers for the purpose of achieving the highest possible efficiency in the outputs of the production process (Al-Tamimi and Saad, 2022: 176).

Therefore, cellular manufacturing can be defined procedurally in the researched laboratory as the laboratory presenting a group of similar products by placing the workstations close together.

Rapid change: refers to the speed at which molds are replaced in a matter of minutes, and its goal is to reduce preparation and preparation time (Mazhar and Azab, 2011: 230). Al-Khadrawi adds that rapid change is a fundamental basis for rational manufacturing, because rational manufacturing aims to reduce of the stops or malfunctions that occur due to the preparation and configuration of machines or a change in the model or composition of the product

The third section: the field aspect of the research

In this study, the measurement tool, represented by the questionnaire form, will be tested in terms of its validity and reliability, based on apparent validity measures and through the Cronbach's alpha coefficient for internal consistency, as well as testing the normal distribution of the data, and then describing the study variables, diagnosing them, and testing the formulated hypotheses.

Fourthly. Test the search tool

The researchers relied on the validity and reliability test on the apparent validity and Cronbach's alpha coefficient for internal consistency, as follows:

a. Apparent honesty: The initial model of the questionnaire was presented to a number of specialized arbitrators at the College of Administration and Economics/Tikrit University, the number of whom was (one) arbitrators. Some sentences were trimmed and others were deleted and replaced according to the opinions and instructions given to produce the form in its final and approved form.

B. Validity of the scale: Self-validity was adopted in expressing the validity of the scale and was calculated by finding the square root of the reliability coefficient Cronbach's Alpha, as Table (4) shows that the value ranged between (0.854-0.972), which is a high value and which Reflects an acceptable representation of the questionnaire items.

Table (4): The value of Cronbach's alpha coefficients and validity for the research variables

Honesty coefficient	Cronbach's alpha coefficient	variable
0.871	0.759	**First: Total Quality Management**
0.854	0.729	**Second: Comprehensive productive maintenance**
0.869	0.755	**Third: Continuous improvement**
0.870	0.757	**Specified the time in Production : Fourth**
0.890	0.792	**Fifth: Cellular manufacturing**
0.950	0.903	**Sixth: Rapid change**
0.972	0.945	**Variable: Guide Manufacturing Strategies**

.Source: Table prepared by the researcher based on the results of statistical analysis

C. Reliability of the questionnaire: It is clear from Table (4) that the value of Cronbach's alpha ranged between (0.729-0.945), which expresses the reliability of the questionnaire. These values are considered acceptable in a way that reflects the availability of reliability and confidence in the research variables and confirms its validity for the following stages of analysis. Therefore, this indicates the stability of the questionnaire in measurement and gives researchers the right to adopt the results and circulate them to the research community.

Fifth. And describe and diagnose phrases and search variables

The researcher conducted a descriptive analysis of the data using the statistical program (SPSS Ver. 22), with the aim of identifying the values of the arithmetic means, standard deviations, and the highest and lowest values that explain the characteristics of the search terms according to the opinions of the respondents. The results were as shown in Table (6).

Table (6): Results of the descriptive analysis of the opinions of the respondents

Relative importance %	Coefficient of variation	minimum value	higher value	standard deviation	Arithmetic mean	ferries	T
70.0%	25.0%	5.0	1.0	0.876	3.500	Enough Quantity Availability To Necessary Resources from Its operations develop	1
64.5%	29.8%	5.0	1.0	0.961	3.227	from More staff Granted in To participate Authority the problems Solution	2
75.5%	21.3%	5.0	2.0	0.803	3.773	By conducting get up Its products on Improvements Gradual With a picture	3
66.8%	26.6%	5.0	2.0	0.888	3.341	Opinions Considering take Its development when customers products	4
74.5%	21.9%	5.0	2.0	0.817	3.727	To patrol Meetings I work get up the problems discuss	5
73.6%	24.0%	5.0	2.0	0.883	3.682	With maintenance get up To For equipment Preventive the operation in Pauses avoid Productivity	6
81.4%	20.1%	5.0	2.0	0.818	4.068	And holidays Mistakes with deal Its occurrence Immediately	7
73.6%	21.7%	5.0	2.0	0.800	3.682	To hardware all Availability Maintenance Operations conduct	8
78.2%	18.1%	5.0	2.0	0.709	3.909	With Its products Evolving get up Needs with corresponds what customers	9
69.5%	27.4%	5.0	1.0	0.952	3.477	Its to improve on Working urge during from operations Ideas Subtract on Individuals New	10
76.8%	23.1%	5.0	2.0	0.888	3.841	To limit Costs discount You try prejudice Without The lowest With quality	11
74.5%	26.1%	5.0	1.0	0.973	3.727	Methods finding on Working Its in Waste from challenge operations	12

69.5%	25.2%	5.0	1.0	0.876	3.477	**all from By getting rid get up during from Waste shapes lowest limit to Inventory discount**	**13**
79.1%	18.1%	5.0	2.0	0.714	3.955	**to directly Order to receive To be done the job location Complete products to Convert it Made**	**14**
77.3%	23.4%	5.0	1.0	0.905	3.864	**not Activities from Get rid of it value She adds no that necessary For the laboratory**	**15**
70.5%	27.0%	5.0	1.0	0.952	3.523	**For Response on Ability she has during from market requirements Its operations in Flexibility**	**16**
73.6%	21.7%	5.0	1.0	0.800	3.682	**In a way Machines In order get up For Smooth With a flow Allow Production elements**	**17**
69.5%	23.6%	5.0	1.0	0.821	3.477	**In a way Machines In order get up Materials Costs from decrease half Materials from Inventory Manufactured**	**18**
73.6%	24.7%	5.0	1.0	0.909	3.682	**Its operations in Waste reduce Optimization during from the For stages Continuous Productivity operation**	**19**
72.3%	28.8%	5.0	1.0	1.039	3.614	**Use on staff With training get up Modern Production techniques**	**20**
70.0%	28.6%	5.0	2.0	1.000	3.500	**mankind resources Possess Machines To initialize Eligible By time Waste To avoid quickly**	**21**
72.3%	22.5%	5.0	2.0	0.813	3.614	**In Templates By changing get up Switch Times from decrease shape**	**22**
71.8%	27.1%	5.0	1.0	0.972	3.591	**In Materials ranking on Working time from decrease that shape Handling**	**23**
75.0%	28.8%	5.0	1.0	1.081	3.750	**Tools safety from Make sure not Parts to replace continuously The sound one**	**24**

Source: The table was prepared by the researchers according to theSPSS program .

Table (6) shows the descriptive analysis of all the phrases ofTable (6) shows the descriptive analysis of all the phrases of the guiding manufacturing strategies variable (1-24). These phrases were diagnosed for the purpose of describing them by adopting a number of measures of central tendency. It is noted that there is a large agreement among the respondents regarding all the phrases of the questionnaire, which gives a preliminary indication of the The importance of applying guided manufacturing strategies in the Samarra pharmaceutical factory under investigation. It is noted that phrase No. (7) expressed (dealing with errors and malfunctions as soon as they occur) recorded the highest level of agreement, and it belongs to the second dimension (comprehensive productive maintenance) of the variable of guided manufacturing strategies. While statement No. (2) expressed (gives workers more authority to participate in solving problems) recorded the lowest level of agreement, and it belongs to the first dimension (total quality management) of the guiding manufacturing strategies variable. It is also noted that there is great consistency and a decrease in the dispersion of opinions. Within all expressions, it is indicative of the value of the low standard deviation, as well as the decrease in the coefficient of variation to less than the standard value of (50%). This proves the truth and reality of the agreement confirmed by the arithmetic mean.

While Table (7) shows the characteristics of the research variable and dimensions according to the opinions of the respondents, through the values of the arithmetic means, standard deviations, and the highest and lowest values.

Table (7): Results of the descriptive analysis of the opinions of the respondents

Relative importance %	Coefficient of variation	minimum value	higher value	standard deviation	Arithmetic mean	Variables
69.2%	19.5%	4.5	1.5	0.673	3.460	**First: Total Quality Management**
75.8%	16.3%	5.0	2.5	0.617	3.790	**Second: Comprehensive productive maintenance**
74.8%	18.0%	5.0	2.0	0.673	3.739	**Third: Continuous improvement**
74.1%	17.8%	5.0	2.3	0.659	3.705	**the time in Production : Fourth Specified**
72.3%	19.5%	5.0	1.0	0.704	3.614	**Fifth: Cellular manufacturing**
72.3%	23.7%	5.0	1.5	0.855	3.614	**Sixth: Rapid change**
73.1%	16.2%	4.8	2.2	0.592	3.653	**Variable: Guide Manufacturing Strategies**

Source: The table was prepared by the researchers according to theSPSS program .

Table (7) shows a large agreement on the importance of applying the six guided manufacturing strategies (total quality management, comprehensive productive maintenance, continuous improvement, just-in-time production, cellular manufacturing, rapid change) in terms of the arithmetic mean of (3.653) and the relative importance of (73.1%) While the low value of the standard deviation and coefficient of variation confirms the existence of consistency in the application of these strategies and the lack of dispersion according to the perception of those investigated in the Samarra Pharmaceuticals Laboratory, the dimension () recorded the highest level of agreement........

Sixthly. Normal distribution test

For the purpose of the type of statistical tools that can be adopted in testing research hypotheses, whether they are parametric or non-parametric tools, the two researchers resorted to testing the normal distribution of data in order to measure the fairness of this data, as normally distributed data allows researchers to adopt parametric tools in testing research hypotheses. Using both the skewness coefficient and the kurtosis coefficient to achieve this purpose, as the closer the skewness coefficient values are between (1 to -1) and the kurtosis coefficient values are between (3 to -3), this indicates a normal distribution of the data. Table (8) notes that all skewness and kurtosis coefficients for the research variables and dimensions fall within the permitted limits, so the data follows a normal distribution and then parametric statistical analysis tools and methods can be used. Table (8): Results of the normal distribution test

Kurtosis	Skewness	Variables
0.283	-0.885	**First: Total Quality Management**
-0.552	0.061	**Second: Comprehensive productive maintenance**
0.361	-0.189	**Third: Continuous improvement**
-0.203	-0.169	**the time in Production : Fourth Specified**
2.244	-0.820	**Fifth: Cellular manufacturing**
0.159	-0.459	**Sixth: Rapid change**
-0.140	-0.266	**Variable: Guide Manufacturing Strategies**

Source: The table was prepared by the researchers according to theSPSS program .

Hypothesis testing .8/3

The research is based on two hypotheses, as described previously within the methodology. Below are the results of the tests of those hypotheses and a discussion of their results:

The first hypothesis: The researched organization applies guided manufacturing strategies (total quality management, comprehensive productive maintenance, continuous improvement, just-in-time production, cellular manufacturing, rapid change) in its operations.

For the purpose of evaluating the reality of applying the six guiding manufacturing strategies (total quality management, comprehensive productive maintenance, continuous improvement, just-in-time production, cellular manufacturing, and rapid change) from the perspective of the research sample members, the One Sample T Test was used, and the table shows (9) The following are the results of the t-test:

Table (9): t-test values for the means of dimensions of guided manufacturing strategies

Differences	Probability sig	value T	**Dimensions**
moral	0.000	4.534	**First: Total Quality Management**
moral	0.000	8.491	**Second: Comprehensive productive maintenance**
moral	0.000	7.277	**Third: Continuous improvement**
moral	0.000	7.095	**the time in Production : Fourth Specified**
moral	0.000	5.782	**Fifth: Cellular manufacturing**
moral	0.000	4.761	**Sixth: Rapid change**

N=44 **df (43) p ≤ 0.05**

Source: The table was prepared by the researchers according to theSPSS program .

It is noted from Table (9) that there is significant agreement between the means of the sample members regarding the evaluation of the reality of applying the six rationalized manufacturing

strategies in the Samarra Pharmaceutical Factory, as indicated by the significant (T) value at a significance level less than (0.05), so the first hypothesis is accepted.
The second hypothesis: There is a significant correlation between rational manufacturing strategies in the researched organization.

The relationships between the dimensions of the six guiding manufacturing strategies variable were tested using the Pearson correlation coefficient in order to determine the level, strength and direction of the relationship between these six dimensions (total quality management, comprehensive productive maintenance, continuous improvement, on-time production, cellular manufacturing, change). Rapid) all, and Table (10) shows the values of the correlation coefficients for the variables and dimensions of the study.

Table (10): Values of correlation coefficients for the variables and dimensions of the study

xx6	xx5	xx4	xx3	xx2	xx1	Variables and dimensions	
.553 **	.727 **	.625 **	.627 **	0.546 **	1	Pearson	xx1
.000	.000	.000	.000	.000		)Sig (	
.658 **	.592 **	.645 **	.711 **	1		Pearson	xx2
.000	.000	.000	.000			)Sig (	
.684 **	.619 **	.680 **	1			Pearson	xx3
.000	.000	.000				)Sig (	
0.766 **	0.789 **	1				Pearson	xx4
.000	.000					)Sig (	
0.729 **	1					Pearson	xx5
.000						)Sig (	
1						Pearson	xx6
						)Sig (	

Source: The table was prepared by the researchers according to theSPSS program .
indicates that the correlation is significant at (1%), * indicates that the correlation is ** significant at (5%)

It is noted from Table (10) that there is a significant positive correlation between the six dimensions of rationalized manufacturing strategies at a level of statistical significance less than (5%). It is noted that the strongest correlation was between just-in-time production and cellular manufacturing with a correlation coefficient of (0.789**), followed by the relationship Between on-time production and rapid change with a correlation coefficient of (0.766**), then the relationship between cellular manufacturing and rapid change with a correlation coefficient of (0.729**), while the lowest relationship was between total quality management and comprehensive productive maintenance with a correlation coefficient of (0.546**), Based on the above, the second hypothesis of the research is accepted.

Conclusions and recommendations

First: descriptive conclusions

The management of the Samarra Pharmaceuticals Factory has a vision of all the guided manufacturing strategies, especially the comprehensive productive maintenance strategy, but it needs to show more attention to the comprehensive quality management strategy. At the level of each of the guided manufacturing strategies, the researchers adopt the following conclusions:

1. With regard to the comprehensive quality management strategy, the factory management invests in this strategy, especially by gradually introducing improvements to its products.
2. With regard to the comprehensive productive maintenance strategy, the factory management invests in this strategy, especially by dealing with errors as soon as they occur, and this positively affects its work, but it needs to give workers more authority to participate in solving problems.
3. With regard to the continuous improvement strategy, the factory management is investing in this strategy, especially by developing its products in accordance with the needs of customers, but it needs to introduce more improvements to its operations by urging individuals to put forward new ideas.
4. With regard to the just-in-time production strategy, the factory management invests in this strategy, especially by delivering the order directly to the work site to be converted into finished products, but it needs to show more interest in reducing inventory to the minimum to get rid of all forms of waste.
5. With regard to the cellular manufacturing strategy, the factory management is investing in this strategy, especially by arranging the machines in a way that allows a smooth flow of production elements, as well as reducing waste in its operations through continuous improvement of the stages of the production process.
6. With regard to the rapid change strategy, the laboratory management invests in this strategy, especially by constantly ensuring the safety of tools to replace incorrect parts.

Second: Conclusions of the research hypotheses

1. The factory management applies the six guided manufacturing strategies (total quality management, comprehensive productive maintenance, continuous improvement, on-time production, cellular manufacturing, and rapid change) in its production processes.
2. Investing in the six guided manufacturing strategies by administrative leaders would increase the efficiency of production processes and reduce waste and loss of resources because these strategies are compatible with each other and do not contradict each other when applied by administrative leaders.

Third: Recommendations

Because the factory management has a perception of rationalized manufacturing strategies, these perceptions must be maintained by introducing new workers to training courses that include introducing these prevention strategies and how to apply them in an optimal manner. At the level of sub-strategies, the researchers adopt the following recommendations:
1. With regard to the comprehensive quality management strategy, the laboratory management must continue to gradually introduce improvements to its products by conducting research and studies on the medicines provided to patients and benefiting from the experiences of other companies in developing their medicines.
2. With regard to the comprehensive productive maintenance strategy, the factory management must work to form committees from various specializations that adopt the process of diagnosing problems and working to address them, and serve as a link between working individuals who may provide opinions and suggestions through their experience that contribute to solving problems more quickly, as well as the possibility of avoiding the problem. Before it happened
3. With regard to the strategy of continuous improvement, the management of the laboratory, when applying this strategy, should work to encourage individuals to present new ideas that contribute to

improving its operations in a way that makes them compete with other pharmaceutical companies in the quality of their products and the possibility of increasing the quantity of production of products that meet the needs of patients.

4. Regarding the just-in-time production strategy, the factory management must balance delivering the order directly to the work site to be converted into finished products and reducing inventory to the minimum to eliminate all forms of waste.

5. With regard to the cellular manufacturing strategy, the factory management must work to maintain the arrangement of machines in a way that allows a smooth flow of production elements, as well as reduce waste in its operations through continuous improvement of the stages of the production process.

6. With regard to the rapid change strategy, the factory management must constantly continue operations to ensure the safety of tools to replace defective parts in order to avoid interruption in production processes.

As for the two research hypotheses, the researchers adopt the following recommendation:

The laboratory management must maintain the application of the six guiding manufacturing strategies (total quality management, comprehensive productive maintenance, continuous improvement, on-time production, cellular manufacturing, and rapid change) in its production processes to provide products and services that meet the needs of patients, especially at this time when the environment is experiencing There are few factories in Iraq that produce medical products. Moreover, investing in this strategy is one of the means that increases the efficiency of production processes and reduces waste and loss of resources, because these strategies are compatible with each other and do not contradict each other when applied by administrative leaders.

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